ArcSinh

Notations

Traditional name

Inverse hyperbolic sine

Traditional notation

$\sinh^{-1}(z)$

Mathematica StandardForm notation

`ArcSinh[z]`

Primary definition

01.25.02.0001.01

$$\sinh^{-1}(z) = \log\left(z + \sqrt{z^2+1}\right)$$

The function $\sinh^{-1}(z)$ can also be defined as the inverse function for $\sinh(w)$:
$w = \sinh^{-1}(z)$ if and only if $\sinh(w) = z$.

Specific values

Values at fixed points

01.25.03.0001.01

$$\sinh^{-1}(0) = 0$$

01.25.03.0002.01

$$\sinh^{-1}\left(\frac{\left(\sqrt{3}-1\right)i}{2^{3/2}}\right) = \frac{\pi i}{12}$$

01.25.03.0003.01

$$\sinh^{-1}\left(-\frac{\left(\sqrt{3}-1\right)i}{2^{3/2}}\right) = -\frac{\pi i}{12}$$

01.25.03.0004.01

$$\sinh^{-1}\left(\frac{i}{4}\left(\sqrt{5}-1\right)\right) = \frac{\pi i}{10}$$

01.25.03.0005.01

$$\sinh^{-1}\left(-\frac{i}{4}\left(\sqrt{5}-1\right)\right) = -\frac{\pi i}{10}$$

01.25.03.0006.01

$$\sinh^{-1}\left(\frac{i\sqrt{2-\sqrt{2}}}{2}\right) = \frac{\pi i}{8}$$

01.25.03.0007.01

$$\sinh^{-1}\left(-\frac{i\sqrt{2-\sqrt{2}}}{2}\right) = -\frac{\pi i}{8}$$

01.25.03.0008.01

$$\sinh^{-1}\left(\frac{i}{2}\right) = \frac{\pi i}{6}$$

01.25.03.0009.01

$$\sinh^{-1}\left(-\frac{i}{2}\right) = -\frac{\pi i}{6}$$

01.25.03.0010.01

$$\sinh^{-1}\left(\frac{i}{2}\sqrt{\frac{5-\sqrt{5}}{2}}\right) = \frac{\pi i}{5}$$

01.25.03.0011.01

$$\sinh^{-1}\left(-\frac{i}{2}\sqrt{\frac{5-\sqrt{5}}{2}}\right) = -\frac{\pi i}{5}$$

01.25.03.0012.01

$$\sinh^{-1}\left(\frac{\sqrt{2}\, i}{2}\right) = \frac{\pi i}{4}$$

01.25.03.0013.01

$$\sinh^{-1}\left(-\frac{\sqrt{2}\, i}{2}\right) = -\frac{\pi i}{4}$$

01.25.03.0014.01

$$\sinh^{-1}\left(\frac{i}{4}\left(\sqrt{5}+1\right)\right) = \frac{3\pi i}{10}$$

01.25.03.0015.01

$$\sinh^{-1}\left(-\frac{i}{4}\left(\sqrt{5}+1\right)\right) = -\frac{3\pi i}{10}$$

01.25.03.0016.01

$$\sinh^{-1}\left(\frac{\sqrt{3}\, i}{2}\right) = \frac{\pi i}{3}$$

01.25.03.0017.01

$$\sinh^{-1}\left(-\frac{\sqrt{3}\,i}{2}\right) = -\frac{\pi\,i}{3}$$

01.25.03.0018.01

$$\sinh^{-1}\left(\frac{i\sqrt{2+\sqrt{2}}}{2}\right) = \frac{3\,\pi\,i}{8}$$

01.25.03.0019.01

$$\sinh^{-1}\left(-\frac{i\sqrt{2+\sqrt{2}}}{2}\right) = -\frac{3\,\pi\,i}{8}$$

01.25.03.0020.01

$$\sinh^{-1}\left(\frac{i}{2}\sqrt{\frac{5+\sqrt{5}}{2}}\right) = \frac{2\,\pi\,i}{5}$$

01.25.03.0021.01

$$\sinh^{-1}\left(-\frac{i}{2}\sqrt{\frac{5+\sqrt{5}}{2}}\right) = -\frac{2\,\pi\,i}{5}$$

01.25.03.0022.01

$$\sinh^{-1}\left(\frac{\left(\sqrt{3}+1\right)i}{2\sqrt{2}}\right) = \frac{5\,\pi\,i}{12}$$

01.25.03.0023.01

$$\sinh^{-1}\left(-\frac{\left(\sqrt{3}+1\right)i}{2\sqrt{2}}\right) = -\frac{5\,\pi\,i}{12}$$

01.25.03.0024.01

$$\sinh^{-1}(i) = \frac{\pi\,i}{2}$$

01.25.03.0025.01

$$\sinh^{-1}(-i) = -\frac{\pi\,i}{2}$$

01.25.03.0026.01

$$\sinh^{-1}(1) = \log\left(\sqrt{2}+1\right)$$

01.25.03.0027.01

$$\sinh^{-1}(-1) = \log\left(\sqrt{2}-1\right)$$

Values at infinities

01.25.03.0028.01

$$\sinh^{-1}(\infty) = \infty$$

01.25.03.0029.01

$\sinh^{-1}(-\infty) = -\infty$

01.25.03.0030.01

$\sinh^{-1}(i\infty) = \infty$

01.25.03.0031.01

$\sinh^{-1}(-i\infty) = -\infty$

01.25.03.0032.01

$\sinh^{-1}(\tilde{\infty}) = \tilde{\infty}$

General characteristics

Domain and analyticity

$\sinh^{-1}(z)$ is an analytical function of z, which is defined over the whole complex z-plane.

01.25.04.0001.01

$z \longrightarrow \sinh^{-1}(z) :: \mathbb{C} \longrightarrow \mathbb{C}$

Symmetries and periodicities

Parity

$\sinh^{-1}(z)$ is an odd function.

01.25.04.0002.01

$\sinh^{-1}(-z) = -\sinh^{-1}(z)$

Mirror symmetry

01.25.04.0003.01

$\sinh^{-1}(\bar{z}) = \overline{\sinh^{-1}(z)} \;/;\; i z \notin (-\infty, -1) \bigwedge i z \notin (1, \infty)$

Periodicity

No periodicity

Poles and essential singularities

The function $\sinh^{-1}(z)$ does not have poles and essential singularities.

01.25.04.0004.01

$\mathcal{Sing}_z(\sinh^{-1}(z)) = \{\}$

Branch points

The function $\sinh^{-1}(z)$ has three branch points: $z = \pm i$, $z = \tilde{\infty}$.

01.25.04.0005.01

$\mathcal{BP}_z(\sinh^{-1}(z)) = \{-i, i, \tilde{\infty}\}$

01.25.04.0006.01

$$\mathcal{R}_z\left(\sinh^{-1}(z),\, i\right) = 2$$

01.25.04.0007.01

$$\mathcal{R}_z\left(\sinh^{-1}(z),\, -i\right) = 2$$

01.25.04.0008.01

$$\mathcal{R}_z\left(\sinh^{-1}(z),\, \tilde{\infty}\right) = \log$$

Branch cuts

The function $\sinh^{-1}(z)$ is a single-valued function on the z-plane cut along the intervals $(-i\infty, -i)$ and $(i, i\infty)$.
The function $\sinh^{-1}(z)$ is continuous from the left on the interval $(-i\infty, -i)$ and from the right on the interval $(i, i\infty)$.

01.25.04.0009.01

$$\mathcal{BC}_z\left(\sinh^{-1}(z)\right) = \{\{(-i\infty, -i], 1\}, \{[i, i\infty), -1\}\}$$

01.25.04.0010.01

$$\lim_{\epsilon\to+0} \sinh^{-1}(x-\epsilon) = \sinh^{-1}(x) \;/;\; i\,x > 1$$

01.25.04.0011.01

$$\lim_{\epsilon\to+0} \sinh^{-1}(x+\epsilon) = -\sinh^{-1}(x) - i\,\pi \;/;\; i\,x > 1$$

01.25.04.0012.01

$$\lim_{\epsilon\to+0} \sinh^{-1}(x+\epsilon) = \sinh^{-1}(x) \;/;\; i\,x < -1$$

01.25.04.0013.01

$$\lim_{\epsilon\to+0} \sinh^{-1}(x-\epsilon) = -\sinh^{-1}(x) + i\,\pi \;/;\; i\,x < -1$$

Analytic continuations

The analytic continuation of $\sinh^{-1}$ has infinitely many sheets; the values of $\widetilde{\sinh}^{-1}$ are $\widetilde{\sinh}^{-1}(z) = \sinh^{-1}(z) + 2\,k\,i\,\pi \;/;\; k \in \mathbb{Z}$.

Series representations

Generalized power series

Expansions at generic point $z = z_0$

For the function itself

01.25.06.0023.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \left(\frac{1}{1 - i z_0}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} (1 - i z_0)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} \left(2 \pi i^{\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor \left\lfloor\frac{\arg(i z_0 + 1) + \pi}{2\pi}\right\rfloor + \frac{1}{2}\left(\frac{1}{i z_0 + 1}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} (i z_0 + 1)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left(i \pi + 2 \sinh^{-1}(z_0) + \frac{2(z - z_0)}{\sqrt{z_0^2 + 1}} - \frac{z_0 (z - z_0)^2}{(z_0^2 + 1)^{3/2}} + \ldots\right)\right) /; (z \to z_0)$$

01.25.06.0024.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \left(\frac{1}{1 - i z_0}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} (1 - i z_0)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} \left(2 \pi i^{\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor \left\lfloor\frac{\arg(i z_0 + 1) + \pi}{2\pi}\right\rfloor + \frac{1}{2}\left(\frac{1}{i z_0 + 1}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} (i z_0 + 1)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left(i \pi + 2 \sinh^{-1}(z_0) + \frac{2(z - z_0)}{\sqrt{z_0^2 + 1}} - \frac{z_0 (z - z_0)^2}{(z_0^2 + 1)^{3/2}} + O\left((z - z_0)^3\right)\right)\right)$$

01.25.06.0025.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \left(\frac{1}{1 - i z_0}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} (1 - i z_0)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} \left(2 \pi i^{\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor \left\lfloor\frac{\arg(i z_0 + 1) + \pi}{2\pi}\right\rfloor + \frac{1}{2}\left(\frac{1}{i z_0 + 1}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} (i z_0 + 1)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left(\pi i + 2 \sinh^{-1}(z_0) + \sqrt{\pi} \sum_{k=1}^{\infty} \sum_{j=0}^{k} \frac{i^{k-1} \left(-\frac{1}{2}\right)_{k-j}}{(k-j)!\, j!} (1 - i z_0)^{j-k+\frac{1}{2}} (i z_0 + 1)^{\frac{1}{2}-j} {}_2\tilde{F}_1\left(1, 1; \frac{3}{2} - j; \frac{1}{2}(i z_0 + 1)\right) (z - z_0)^k\right)\right)$$

01.25.06.0026.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \left(\frac{1}{1 - i z_0}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} (1 - i z_0)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} \left(2 \pi i^{\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor \left\lfloor\frac{\arg(i z_0 + 1) + \pi}{2\pi}\right\rfloor + \frac{1}{2}\left(\frac{1}{i z_0 + 1}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} (i z_0 + 1)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left(\pi i + \sqrt{\pi} \sum_{k=0}^{\infty} \frac{2^k z_0^{1-k}}{k!} {}_3\tilde{F}_2\left(\frac{1}{2}, \frac{1}{2}, 1; 1 - \frac{k}{2}, \frac{3-k}{2}; -z_0^2\right) (z - z_0)^k\right)\right)$$

01.25.06.0027.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \left(\frac{1}{1 - i z_0}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} (1 - i z_0)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z_0-z))}{2\pi}\right\rfloor} \left(2 \pi i^{\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor \left\lfloor\frac{\arg(i z_0 + 1) + \pi}{2\pi}\right\rfloor + \frac{1}{2}\left(\frac{1}{i z_0 + 1}\right)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} (i z_0 + 1)^{\frac{1}{2}\left\lfloor\frac{\arg(i(z-z_0))}{2\pi}\right\rfloor} \left(i \pi + 2 \sinh^{-1}(z_0) + O(z - z_0)\right)\right)$$

Expansions on branch cuts

For the function itself

In the lower half-plane

01.25.06.0028.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + e^{\pi i \left\lfloor \frac{\arg(i(x-z))}{2\pi} \right\rfloor} \left(\sinh^{-1}(x) + \frac{i\pi}{2} + \frac{1}{\sqrt{x^2+1}} (z-x) - \frac{x}{2\left(x^2+1\right)^{3/2}} (z-x)^2 + \ldots \right) /; (z \to x) \land i\,x \in \mathbb{R} \land i\,x > 1$$

01.25.06.0029.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + e^{\pi i \left\lfloor \frac{\arg(i(x-z))}{2\pi} \right\rfloor} \left(\sinh^{-1}(x) + \frac{i\pi}{2} + \frac{1}{\sqrt{x^2+1}} (z-x) - \frac{x}{2\left(x^2+1\right)^{3/2}} (z-x)^2 + O\left((z-x)^3\right) \right) /; i\,x \in \mathbb{R} \land i\,x > 1$$

01.25.06.0030.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(x-z))}{2\pi} \right\rfloor} \left(\pi i + 2\sinh^{-1}(x) + \sqrt{\pi} \sum_{k=1}^{\infty} \sum_{j=0}^{k} \frac{i^{k-1} \left(-\frac{1}{2}\right)_{k-j}}{(k-j)!\, j!} (1 - i\,x)^{j-k+\frac{1}{2}} (i\,x+1)^{\frac{1}{2}-j} {}_2\tilde{F}_1\left(1, 1; \frac{3}{2} - j; \frac{1}{2}(i\,x+1)\right) (z-x)^k \right) /; i\,x \in \mathbb{R} \land i\,x > 1$$

01.25.06.0031.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(x-z))}{2\pi} \right\rfloor} \left(\pi i + \sqrt{\pi} \sum_{k=0}^{\infty} \frac{2^k x^{1-k}}{k!} {}_3\tilde{F}_2\left(\frac{1}{2}, \frac{1}{2}, 1; 1 - \frac{k}{2}, \frac{3-k}{2}; -x^2\right) (z-x)^k \right)$$

01.25.06.0032.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(x-z))}{2\pi} \right\rfloor} \left(2\sinh^{-1}(x) + i\pi\right) (1 + O(z-x)) /; i\,x \in \mathbb{R} \land i\,x > 1$$

In the upper half-plane

01.25.06.0033.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \left(2\pi i^{\left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left(2\sinh^{-1}(x) + i\pi + \frac{2(z-x)}{\sqrt{x^2+1}} - \frac{x(z-x)^2}{\left(x^2+1\right)^{3/2}} + \ldots \right) \right) /;$$

$$(z \to x) \land i\,x \in \mathbb{R} \land i\,x < -1$$

01.25.06.0034.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \left(2\pi i^{\left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left(2\sinh^{-1}(x) + i\pi + \frac{2(z-x)}{\sqrt{x^2+1}} - \frac{x(z-x)^2}{\left(x^2+1\right)^{3/2}} + O\left((z-x)^3\right) \right) \right) /;$$

$$i\,x \in \mathbb{R} \land i\,x < -1$$

01.25.06.0035.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \left(2\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left(\pi i + 2\sinh^{-1}(x) + \sqrt{\pi} \sum_{k=1}^{\infty} \sum_{j=0}^{k} \frac{i^{k-1} \left(-\frac{1}{2}\right)_{k-j}}{(k-j)!\, j!} (1 - i x)^{j-k+\frac{1}{2}} (i x + 1)^{\frac{1}{2}-j} {}_2\tilde{F}_1\left(1, 1; \frac{3}{2} - j; \frac{1}{2}(i x + 1)\right) (z-x)^k \right)\right) /; i x \in \mathbb{R} \wedge i x < -1$$

01.25.06.0036.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \left(2\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left(\pi i + \sqrt{\pi} \sum_{k=0}^{\infty} \frac{2^k x^{1-k}}{k!} {}_3\tilde{F}_2\left(\frac{1}{2}, \frac{1}{2}, 1; 1 - \frac{k}{2}, \frac{3-k}{2}; -x^2\right) (z-x)^k \right)\right) /; i x \in \mathbb{R} \wedge i x < -1$$

01.25.06.0037.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \left(2\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor + \frac{1}{2} e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi} \right\rfloor} \left(\pi i + 2\sinh^{-1}(x)\right)\right) (1 + O(z-x)) /; i x \in \mathbb{R} \wedge i x < -1$$

Expansions at $z = 0$

For the function itself

01.25.06.0001.02

$$\sinh^{-1}(z) \propto z - \frac{z^3}{6} + \frac{3 z^5}{40} - \ldots /; (z \to 0)$$

01.25.06.0038.01

$$\sinh^{-1}(z) \propto z - \frac{z^3}{6} + \frac{3 z^5}{40} + O(z^7)$$

01.25.06.0002.01

$$\sinh^{-1}(z) = \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{2k+1}}{(2k+1)\, k!} /; |z| < 1$$

01.25.06.0003.01

$$\sinh^{-1}(z) = z\, {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; -z^2\right)$$

01.25.06.0004.02

$$\sinh^{-1}(z) \propto z + O(z^3)$$

01.25.06.0039.01

$$\sinh^{-1}(z) = F_\infty(z) /; \left(\left(F_n(z) = \sum_{k=0}^{n} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{2k+1}}{(2k+1)\, k!} = \frac{(-1)^n z^{2n+3}}{2\sqrt{\pi}} \Gamma\left(n + \frac{3}{2}\right)^2 {}_3\tilde{F}_2\left(1, n + \frac{3}{2}, n + \frac{3}{2}; n + 2, n + \frac{5}{2}; -z^2\right) + \sinh^{-1}(z)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.25.06.0005.02

$$\sinh^{-1}(z)^2 \propto z^2 - \frac{z^4}{3} + \frac{8\,z^6}{45} - \ldots \;/;\; (z \to 0)$$

01.25.06.0040.01

$$\sinh^{-1}(z)^2 \propto z^2 - \frac{z^4}{3} + \frac{8\,z^6}{45} + O\left(z^8\right)$$

01.25.06.0006.01

$$\sinh^{-1}(z)^2 = \sum_{k=0}^{\infty} \frac{(-1)^k\, 2^{2k}\, k!^2\, z^{2k+2}}{(2k+1)!\,(k+1)} \;/;\; |z| < 1$$

01.25.06.0007.01

$$\sinh^{-1}(z)^2 = z^2\, {}_3F_2\left(1, 1, 1; \frac{3}{2}, 2; -z^2\right)$$

01.25.06.0008.02

$$\sinh^{-1}(z)^2 \propto z^2 + O\left(z^4\right)$$

01.25.06.0041.01

$$\sinh^{-1}(z)^2 = F_\infty(z) \;/;$$
$$\left(\left(F_n(z) = \sum_{k=0}^{n} \frac{(-1)^k\, 2^{2k}\, k!^2\, z^{2k+2}}{(2k+1)!\,(k+1)} = \frac{1}{2}(-1)^n \sqrt{\pi}\, \Gamma(n+2)^2\, z^{2n+4}\, {}_3\tilde{F}_2\left(1, n+2, n+2; n+\frac{5}{2}, n+3; -z^2\right) + \sinh^{-1}(z)^2\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Expansions at $z = i$

For the function itself

01.25.06.0009.02

$$\sinh^{-1}(z) \propto \frac{\pi i}{2} - \sqrt{2}\, i \sqrt{i\,(z-i)} \left(1 + \frac{i}{12}(z-i) - \frac{3}{160}(z-i)^2 + \ldots\right) \;/;\; (z \to i)$$

01.25.06.0042.01

$$\sinh^{-1}(z) \propto \frac{\pi i}{2} - \sqrt{2}\, i \sqrt{i\,(z-i)} \left(1 + \frac{i}{12}(z-i) - \frac{3}{160}(z-i)^2 + O\left((z-i)^3\right)\right)$$

01.25.06.0010.01

$$\sinh^{-1}(z) = \frac{i\pi}{2} - \sqrt{2}\, i \sqrt{i\,(z-i)} \sum_{k=0}^{\infty} \frac{\left(\frac{1}{2}\right)_k \left(\frac{i}{2}\right)^k (z-i)^k}{(2k+1)\,k!} \;/;\; |z-i| < 2$$

01.25.06.0043.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \sin^{-1}\left(\sqrt{\frac{i}{2}(z-i)}\right)$$

The last formula allows to express the function at the singular points $z = i$ through the inverse sine function value at the regular point $\tilde{z} = 0$.

01.25.06.0011.01

$$\sinh^{-1}(z) = \frac{i \pi}{2} - \sqrt{2}\, i \sqrt{i (z-i)}\; {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; \frac{i}{2}(z-i)\right)$$

01.25.06.0012.02

$$\sinh^{-1}(z) \propto \frac{\pi i}{2} - \sqrt{2}\, i \sqrt{i (z-i)}\, (1 + O(z-i))$$

01.25.06.0044.01

$$\sinh^{-1}(z) = F_\infty(z) /; \left(\left(F_n(z) = \frac{\pi i}{2} - \sqrt{2}\, i \sqrt{i (z-i)} \sum_{k=0}^{n} \frac{\left(\frac{i}{2}\right)^k \left(\frac{1}{2}\right)_k (z-i)^k}{(2k+1)\, k!} = \sinh^{-1}(z) - \frac{1}{\pi (2n+3)!}\left(i^n 2^{n+\frac{3}{2}} \Gamma\left(n+\frac{3}{2}\right)^2 (z-i)^{n+1} \sqrt{i (z-i)}\; {}_3F_2\left(1, n+\frac{3}{2}, n+\frac{3}{2}; n+2, n+\frac{5}{2}; \frac{i (z-i)}{2}\right)\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.25.06.0045.01

$$\sinh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\, \sqrt{i (z-i)}\, \pi \left(1 + \frac{1}{12} i (z-i) - \frac{3}{160} (z-i)^2 + \ldots\right) - 2 i (z-i) \left(1 + \frac{1}{6} i (z-i) - \frac{2}{45} (z-i)^2 + \ldots\right) /; (z \to i)$$

01.25.06.0046.01

$$\sinh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\, \pi \sqrt{i (z-i)} \left(1 + \frac{1}{12} i (z-i) - \frac{3}{160} (z-i)^2 + O\left((z-i)^3\right)\right) - 2 i (z-i) \left(1 + \frac{1}{6} i (z-i) - \frac{2}{45} (z-i)^2 + O\left((z-i)^3\right)\right)$$

01.25.06.0047.01

$$\sinh^{-1}(z)^2 = -\frac{\pi^2}{4} + \pi \sqrt{2}\, \sqrt{i (z-i)} \sum_{k=0}^{\infty} \frac{i^k \left(\frac{1}{2}\right)_k (z-i)^k}{2^k (2k+1)\, k!} - 2 i (z-i) \left(\sum_{k=0}^{\infty} \frac{i^k \left(\frac{1}{2}\right)_k (z-i)^k}{2^k (2k+1)\, k!}\right)^2 /; |z-i| < 2$$

01.25.06.0048.01

$$\sinh^{-1}(z)^2 = -\left(\frac{\pi}{2} - 2 \sin^{-1}\left(\sqrt{\frac{i}{2}(z-i)}\right)\right)^2$$

The last formula allows to express the function at the singular points $z = i$ through the inverse sine function value at the regular point $\tilde{z} = 0$.

01.25.06.0049.01

$$\sinh^{-1}(z)^2 == -\frac{\pi^2}{4} + \pi \sqrt{2} \sqrt{i(z-i)}\, {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; \frac{i(z-i)}{2}\right) - 2\, i(z-i)\, {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; \frac{i(z-i)}{2}\right)^2$$

01.25.06.0050.01

$$\sinh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2} \sqrt{i(z-i)}\, \pi (1 + O(z-i)) - 2\, i (z-i) (1 + O(z-i))$$

Expansions at $z == -i$

For the function itself

01.25.06.0013.02

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + i \sqrt{2} \sqrt{-i(i+z)} \left(1 - \frac{i}{12}(i+z) - \frac{3}{160}(i+z)^2 + \ldots\right) /; (z \to -i)$$

01.25.06.0051.01

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + i \sqrt{2} \sqrt{-i(i+z)} \left(1 - \frac{i}{12}(i+z) - \frac{3}{160}(i+z)^2 + O\left((z+i)^3\right)\right)$$

01.25.06.0014.02

$$\sinh^{-1}(z) == -\frac{\pi i}{2} + \sqrt{2}\, i \sqrt{-i(z+i)} \sum_{k=0}^{\infty} \frac{\left(\frac{1}{2}\right)_k \left(-\frac{i}{2}\right)^k (z+i)^k}{(2k+1)\, k!} /; |z+i| < 2$$

01.25.06.0052.01

$$\sinh^{-1}(z) == -\frac{\pi i}{2} + 2\, i \sin^{-1}\left(\sqrt{-\frac{i}{2}(z+i)}\right)$$

The last formula allows to express the function at the singular points $z = -i$ through the inverse sine function value at the regular point $\tilde{z} = 0$.

01.25.06.0053.01

$$\sinh^{-1}(z) == -\frac{i\pi}{2} + \frac{2 \sqrt[4]{-1} \sqrt{1 - i z}}{\sqrt{z+i}} \sinh^{-1}\left(\frac{1+i}{2} \sqrt{z+i}\right)$$

The last formula allows to express the function at the singular points $z = -i$ through the function value at the regular point $\tilde{z} = 0$.

01.25.06.0015.02

$$\sinh^{-1}(z) == -\frac{\pi i}{2} + \sqrt{2}\, i \sqrt{-i(z+i)}\, {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; -\frac{i}{2}(z+i)\right)$$

01.25.06.0016.02

$$\sinh^{-1}(z) \propto -\frac{\pi i}{2} + \sqrt{2}\, i \sqrt{-i(z+i)}\, (1 + O(z+i))$$

01.25.06.0054.01

$$\sinh^{-1}(z) == F_\infty(z) \;/;\; \left(\left(F_n(z) == -\frac{\pi i}{2} + \sqrt{2}\, i \sqrt{-i(z+i)} \sum_{k=0}^{n} \frac{\left(-\frac{i}{2}\right)^k \left(\frac{1}{2}\right)_k (z+i)^k}{(2k+1)\, k!} == \right.\right.$$
$$\left.\left. \sinh^{-1}(z) - \frac{(-i)^n\, 2^{n+\frac{3}{2}}\, \Gamma\left(n+\frac{3}{2}\right)^2}{\pi\,(2n+3)!} (z+i)^{n+1} \sqrt{-i(z+i)}\; {}_3F_2\left(1, n+\frac{3}{2}, n+\frac{3}{2}; n+2, n+\frac{5}{2}; -\frac{i(z+i)}{2}\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.25.06.0055.01

$$\sinh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\sqrt{-i(z+i)}\,\pi\left(1 - \frac{1}{12} i(z+i) - \frac{3}{160}(z+i)^2 + \ldots\right) + 2i(z+i)\left(1 - \frac{1}{6} i(z+i) - \frac{2}{45}(z+i)^2 + \ldots\right) /; (z \to -i)$$

01.25.06.0056.01

$$\sinh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\sqrt{-i(z+i)}\,\pi\left(1 - \frac{1}{12} i(z+i) - \frac{3}{160}(z+i)^2 + O\left((z+i)^3\right)\right) + 2i(z+i)\left(1 - \frac{1}{6} i(z+i) - \frac{2}{45}(z+i)^2 + O\left((z+i)^3\right)\right)$$

01.25.06.0057.01

$$\sinh^{-1}(z)^2 == -\frac{\pi^2}{4} + \pi\sqrt{2}\sqrt{-i(z+i)} \sum_{k=0}^{\infty} \frac{(-i)^k \left(\frac{1}{2}\right)_k (z+i)^k}{2^k (2k+1)\, k!} + 2i(z+i)\left(\sum_{k=0}^{\infty} \frac{(-i)^k \left(\frac{1}{2}\right)_k (z+i)^k}{2^k (2k+1)\, k!}\right)^2 /; |z+i| < 2$$

01.25.06.0058.01

$$\sinh^{-1}(z)^2 == -\left(\frac{\pi}{2} - 2\sin^{-1}\left(\sqrt{-\frac{i}{2}(z+i)}\right)\right)^2$$

The last formula allows to express the function at the singular points $z = -i$ through the inverse sine function value at the regular point $\tilde{z} = 0$.

01.25.06.0059.01

$$\sinh^{-1}(z)^2 == -\frac{\pi^2}{4} + \pi\sqrt{2}\sqrt{-i(z+i)}\; {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; -\frac{i(z+i)}{2}\right) + 2i(z+i)\; {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; -\frac{i(z+i)}{2}\right)^2$$

01.25.06.0060.01

$$\sinh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\sqrt{-i(z+i)}\,\pi\,(1 + O(z+i)) + 2i(z+i)(1 + O(z+i))$$

01.25.06.0061.01

$$\sinh^{-1}(z) == F_\infty(z) /; \left(\left(F_n(z) == -\frac{\pi i}{2} + \sqrt{2}\, i \sqrt{-i(z+i)} \sum_{k=0}^{n} \frac{\left(-\frac{i}{2}\right)^k \left(\frac{1}{2}\right)_k (z+i)^k}{(2k+1)\, k!} == \sinh^{-1}(z) - \frac{(-i)^n\, 2^{n+\frac{3}{2}}\, \Gamma\left(n+\frac{3}{2}\right)^2}{\pi\,(2n+3)!} (z+i)^{n+1} \sqrt{-i(z+i)}\; {}_3F_2\left(1, n+\frac{3}{2}, n+\frac{3}{2}; n+2, n+\frac{5}{2}; -\frac{i(z+i)}{2}\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Expansions at $z == \infty$

For the function itself

01.25.06.0017.02

$$\sinh^{-1}(z) \propto \frac{z}{2\sqrt{z^2}} \left(\log(4z^2) + \frac{1}{2z^2} + \frac{3}{16z^4} + \ldots\right) /; |z| \to \infty$$

01.25.06.0062.01

$$\sinh^{-1}(z) \propto \frac{z}{2\sqrt{z^2}} \left(\log(4z^2) + \frac{1}{2z^2} + \frac{3}{16z^4} + O\left(\frac{1}{z^6}\right)\right)$$

01.25.06.0018.01

$$\sinh^{-1}(z) == \frac{z}{2\sqrt{z^2}} \left(\log(4z^2) - \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{-2k}}{k\, k!}\right) /; |z| > 1$$

01.25.06.0019.01

$$\sinh^{-1}(z) == \frac{z}{2\sqrt{z^2}} \left(\log(4z^2) + \frac{1}{2z^2}\, {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -\frac{1}{z^2}\right)\right) /; i z \notin (-1, 1)$$

01.25.06.0020.02

$$\sinh^{-1}(z) \propto \frac{z \log(4z^2)}{2\sqrt{z^2}} + \frac{\sqrt{z^2}}{4z^3} \left(1 + O\left(\frac{1}{z^2}\right)\right)$$

01.25.06.0063.01

$$\sinh^{-1}(z) \propto \begin{cases} -i\pi - \log(2z) & \arg(z) \le -\frac{\pi}{2} \\ \log(2z) & -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2} \\ i\pi - \log(2z) & \text{True} \end{cases} /; (|z| \to \infty)$$

01.25.06.0064.01

$$\sinh^{-1}(z) == F_\infty(z) /; \left(\left(F_n(z) == \frac{z}{2\sqrt{z^2}} \left(\log(4z^2) + \frac{1}{2z^2} \sum_{k=0}^{n} \frac{(-1)^k \left(\frac{3}{2}\right)_k z^{-2k}}{(k+1)^2\, k!}\right) == \sinh^{-1}(z) - \frac{3i(-1)^n z^{-2(n+2)} \left(\frac{5}{2}\right)_n}{4(n+2)^2 (n+1)!}\, {}_3F_2\left(1, n+\frac{5}{2}, n+2; n+3, n+3; -\frac{1}{z^2}\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.25.06.0065.01

$$\sinh^{-1}(z)^2 \propto \frac{1}{4}\log^2(z^2) + \log(z^2)\left(\log(2) + \frac{1}{4z^2} - \frac{3}{32z^4} + \ldots\right) + \left(\log^2(2) + \frac{\log(2)}{2z^2} - \frac{3\log(2)-1}{16z^4} + \ldots\right) /; (|z| \to \infty)$$

01.25.06.0066.01

$$\sinh^{-1}(z)^2 \propto \frac{1}{4}\log^2(z^2) + \log(z^2)\left(\log(2) + \frac{1}{4z^2} - \frac{3}{32z^4} + O\left(\frac{1}{z^6}\right)\right) + \left(\log^2(2) + \frac{\log(2)}{2z^2} - \frac{3\log(2)-1}{16z^4} + O\left(\frac{1}{z^6}\right)\right)$$

01.25.06.0067.01

$$\sinh^{-1}(z)^2 = \frac{1}{4}\log^2(4z^2) + \frac{\log(z^2)}{4z^2}\sum_{k=0}^{\infty}\frac{\left((-1)^k\left(\frac{3}{2}\right)_k\right)z^{-2k}}{(k+1)^2\,k!} + \frac{1}{2z^2}\sum_{k=0}^{\infty}\frac{\left((-1)^k\left(\frac{3}{2}\right)_k\right)z^{-2k}}{(k+1)^3\,k!} - \frac{1}{4z^2}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{3}{2}\right)_k\left(\psi\left(-k-\frac{1}{2}\right)-\psi(k+1)\right)z^{-2k}}{(k+1)^2\,k!} /; |z| > 1$$

01.25.06.0068.01

$$\sinh^{-1}(z)^2 = \frac{1}{4}\log^2(4z^2) + \frac{\log(4z^2)}{4z^2}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{3}{2}\right)_k z^{-2k}}{(k+1)^2\,k!} + \frac{1}{64z^4}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{3}{2}\right)_k z^{-2k}}{(k+1)^2\,k!}\right)^2 /; |z| > 1$$

01.25.06.0069.01

$$\sinh^{-1}(z)^2 = \frac{1}{4}\log^2(4z^2) + \log^2\left(\frac{1}{2}\left(\sqrt{1+\frac{1}{z^2}}+1\right)\right) + \log(z^2)\log\left(\frac{1}{2}\left(\sqrt{1+\frac{1}{z^2}}+1\right)\right) - 2\,\mathrm{Li}_2\left(\frac{1}{2}\left(1-\sqrt{1+\frac{1}{z^2}}\right)\right) - \frac{1}{4z^2}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{3}{2}\right)_k\left(\psi\left(-k-\frac{1}{2}\right)-\psi(k+1)\right)z^{-2k}}{(k+1)^2\,k!} /; |z| > 1$$

01.25.06.0070.01

$$\sinh^{-1}(z)^2 = \frac{1}{4}\log^2(4z^2) + \frac{\log(z^2)}{4z^2}\,{}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -\frac{1}{z^2}\right) + \frac{1}{2z^2}\,{}_4F_3\left(\frac{3}{2}, 1, 1, 1; 2, 2, 2; -\frac{1}{z^2}\right) - \frac{1}{4z^2}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{3}{2}\right)_k\left(\psi\left(-k-\frac{1}{2}\right)-\psi(k+1)\right)z^{-2k}}{(k+1)^2\,k!} /; |z| > 1$$

01.25.06.0071.01

$$\sinh^{-1}(z)^2 = \frac{1}{4}\log^2(4z^2) + \frac{\log(4z^2)}{4z^2}\,{}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -\frac{1}{z^2}\right) + \frac{1}{64z^4}\,{}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -\frac{1}{z^2}\right)^2$$

01.25.06.0072.01

$$\sinh^{-1}(z)^2 \propto \frac{1}{4}\log^2(z^2) + \log(z^2)\log(2)\left(1 + O\left(\frac{1}{z^2}\right)\right) + \log^2(2)\left(1 + O\left(\frac{1}{z^2}\right)\right)$$

01.25.06.0073.01

$$\sinh^{-1}(z)^2 \propto \log^2(2z) \;/;\; (|z| \to \infty)$$

01.25.06.0074.01

$$\sinh^{-1}(z)^2 = F_\infty(z) \;/;$$
$$\left(\left(F_n(z) = \frac{\log^2(4z^2)}{4} + \frac{\log(4z^2)}{4z^2}\sum_{k=0}^{n}\frac{(-1)^k \left(\frac{3}{2}\right)_k z^{-2k}}{(k+1)^2\, k!} + \frac{1}{16z^4}\left(\sum_{k=0}^{n}\frac{(-1)^k \left(\frac{3}{2}\right)_k z^{-2k}}{(k+1)^2\, k!}\right)^2 = -\frac{z^{-4(n+2)}}{16(n+2)^4\,(n+1)!^2}\right.\right.$$
$$\left.\left.\left(4(-1)^n i\,(n+2)^2 \sinh^{-1}(z)\,(n+1)!\, z^{2(n+2)} + 3\left(\frac{5}{2}\right)_n {}_3F_2\left(1, n+2, n+\frac{5}{2}; n+3, n+3; -\frac{1}{z^2}\right)\right)^2\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Residue representations

01.25.06.0021.01

$$\sinh^{-1}(z) = \frac{1}{2z\sqrt{\pi}}\sum_{j=1}^{\infty}\operatorname{res}_s\left(\frac{\Gamma\left(-s-\frac{1}{2}\right)^2 (z^2)^{-s}}{\Gamma\left(\frac{1}{2}-s\right)}\Gamma(s+1)\right)(-j) \;/;\; |z| < 1$$

01.25.06.0022.01

$$\sinh^{-1}(z) = -\frac{z}{2\sqrt{\pi}}\sum_{j=0}^{\infty}\operatorname{res}_s\left(\frac{\Gamma(s)\,(z^2)^{-s}}{\Gamma\left(\frac{3}{2}-s\right)}\Gamma\left(\frac{1}{2}-s\right)^2\right)\left(\frac{1}{2}+j\right) \;/;\; |z| > 1$$

Integral representations

On the real axis

Of the direct function

01.25.07.0001.01

$$\sinh^{-1}(z) = z\int_0^1 \frac{1}{\sqrt{1+z^2 t^2}}\,dt$$

Contour integral representations

01.25.07.0002.01

$$\sinh^{-1}(z) = \frac{z}{\left(2\sqrt{\pi}\right)2\pi i}\int_{\mathcal{L}}\frac{\Gamma(s)\,\Gamma\left(\frac{1}{2}-s\right)^2}{\Gamma\left(\frac{3}{2}-s\right)}(z^2)^{-s}\,ds \;/;\; \left|\arg(z^2)\right| < \pi$$

01.25.07.0003.01

$$\sinh^{-1}(z) = \frac{z}{\left(2\sqrt{\pi}\right)2\pi i}\int_{\mathcal{L}}\Gamma(s)\,\Gamma\left(s+\frac{1}{2}\right)\Gamma\left(\frac{1}{2}-s\right)^2 (1+z^2)^{-s}\,ds \;/;\; \left|\arg(1+z^2)\right| < \pi$$

01.25.07.0004.01

$$\sinh^{-1}(z) == \frac{z}{\left(2\sqrt{\pi}\right) 2\pi i} \int_{\gamma-i\infty}^{\gamma+i\infty} \frac{\Gamma(s)\,\Gamma\left(\frac{1}{2}-s\right)^2}{\Gamma\left(\frac{3}{2}-s\right)} \left(z^2\right)^{-s} ds \text{ /; } 0 < \gamma < \frac{1}{2} \bigwedge \left|\arg\left(z^2\right)\right| < \pi$$

01.25.07.0005.01

$$\sinh^{-1}(z) == \frac{z}{\left(2\sqrt{\pi}\right) 2\pi i} \int_{\gamma-i\infty}^{\gamma+i\infty} \Gamma(s)\,\Gamma\left(s+\frac{1}{2}\right)\Gamma\left(\frac{1}{2}-s\right)^2 \left(1+z^2\right)^{-s} ds \text{ /; } 0 < \gamma < \frac{1}{2} \bigwedge \left|\arg\left(1+z^2\right)\right| < \pi$$

Continued fraction representations

01.25.10.0001.01

$$\sinh^{-1}(z) == \frac{z\sqrt{1+z^2}}{1+\frac{1\times 2 z^2}{3+\frac{1\times 2 z^2}{5+\frac{3\times 4 z^2}{7+\frac{3\times 4 z^2}{9+\frac{5\times 6 z^2}{11+\ldots}}}}}} \text{ /; } i z \notin (-\infty, -1) \bigwedge i z \notin (1, \infty)$$

01.25.10.0002.01

$$\sinh^{-1}(z) == \frac{z\sqrt{1+z^2}}{1 + \mathrm{K}_k\left(2\left(2\left\lfloor\frac{k+1}{2}\right\rfloor-1\right)\left\lfloor\frac{k+1}{2}\right\rfloor z^2,\, 2k+1\right)_1^\infty} \text{ /; } i z \notin (-\infty, -1) \bigwedge i z \notin (1, \infty)$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

01.25.13.0001.01

$$\left(1+z^2\right) w''(z) + z\, w'(z) == 0 \text{ /; } w(z) == \sinh^{-1}(z) \bigwedge w(0) == 0 \bigwedge w'(0) == 1$$

01.25.13.0002.01

$$\left(1+z^2\right) w''(z) + z\, w'(z) == 0 \text{ /; } w(z) == c_1 + c_2 \sinh^{-1}(z)$$

01.25.13.0003.01

$$W_z\left(1, \sinh^{-1}(z)\right) == \frac{1}{\sqrt{1+z^2}}$$

01.25.13.0004.01

$$\sqrt{1+z^2}\; w'(z) == 1 \text{ /; } w(z) == \sinh^{-1}(z) \bigwedge w(0) == 0$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

Involving $\sinh^{-1}(-z)$

Involving $\sinh^{-1}(-z)$ and $\sinh^{-1}(z)$

01.25.16.0001.01

$$\sinh^{-1}(-z) = -\sinh^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\sinh^{-1}(z)$

01.25.16.0023.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \sinh^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.16.0041.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -\sinh^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigwedge -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.16.0024.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \frac{\sqrt{z^2}\,\sinh^{-1}(z)}{z}$$

Involving $\sinh^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\sinh^{-1}(a\,(b\,z^c)^m)$ and $\sinh^{-1}(a\,b^m\,z^{m\,c})$

01.25.16.0022.01

$$\sinh^{-1}(a\,(b\,z^c)^m) = \frac{(b\,z^c)^m}{b^m\,z^{m\,c}}\,\sinh^{-1}(a\,b^m\,z^{m\,c}) \;/;\; 2\,m \in \mathbb{Z}$$

Involving $\sinh^{-1}\left(\sqrt{-1+c\,z}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\sinh^{-1}\left(i\,\sqrt{z}\right)$

01.25.16.0042.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \frac{\pi\,i}{2} - \sinh^{-1}\left(i\,\sqrt{z}\right) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.16.0043.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(i\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.16.0002.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \left(i \sinh^{-1}\left(i\sqrt{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-z-1}\right)$ and $\sinh^{-1}\left(\sqrt{z}\right)$

01.25.16.0003.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.16.0044.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.16.0045.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.16.0004.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \left(\sinh^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{-z^2}}{2z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-1+c z}{2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2}}\right)$ and $\sinh^{-1}(i z)$

01.25.16.0046.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2}}\right) = \frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}(i z) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.16.0047.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}(i z) /; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.16.0005.01

$$\sinh^{-1}\left(\sqrt{\frac{-1-z}{2}}\right) = -\frac{\sqrt{z+1}}{2\sqrt{-z-1}} \left(\frac{\pi}{2} - i \sinh^{-1}(i z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right)$ and $\sinh^{-1}(i z)$

01.25.16.0048.01

$$\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}(i z) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.16.0049.01

$$\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}(i z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.16.0006.01

$$\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right) = -\frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(i \sinh^{-1}(i z) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.16.0009.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.16.0050.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0$$

01.25.16.0051.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z > 0)$$

01.25.16.0010.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{-\frac{1}{z}}\sqrt{-z}\,\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.16.0052.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.25.16.0053.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0$$

01.25.16.0054.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land z > 0)$$

01.25.16.0055.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \land z < 0)$$

01.25.16.0056.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \frac{\pi \sqrt{-z^2}}{2 z} - \sqrt{-\frac{1}{z^2}} \sqrt{-z^2} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.16.0057.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.16.0058.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.16.0059.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z > -1)$$

01.25.16.0060.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \frac{\pi \sqrt{z+1}}{2\sqrt{-z-1}} - \frac{\sqrt{z}}{\sqrt{-z-1}} \sqrt{-\frac{z+1}{z}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.16.0061.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.16.0062.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.16.0063.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.25.16.0064.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.16.0065.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \sqrt{-\frac{z+1}{z}} \sqrt{-\frac{z}{z+1}} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi \sqrt{z+1}}{2\sqrt{-z-1}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.16.0007.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} /; 0 \leq \arg(z) < \pi$$

01.25.16.0066.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.16.0067.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.16.0008.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \left(\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi\sqrt{-z^2}}{2z} - \frac{\pi i}{2}\left(\sqrt{-\frac{1}{z}}\sqrt{-z} - 1\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.16.0068.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi$$

01.25.16.0069.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.16.0070.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.16.0071.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - \frac{\sqrt{-z}\sqrt{-z-1}}{\sqrt{z+1}} \sqrt{\frac{1}{z}} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0072.01

$$\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > -1$$

01.25.16.0073.01

$$\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) \leq -1 \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.16.0074.01

$$\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right) =$$

$$\frac{i\pi\sqrt{z}}{4\sqrt{-i-z}} \sqrt{-\frac{i+z}{z}} \left(-\sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} + 1\right) + \frac{1}{2}\sqrt{-i-z} \sqrt{\frac{i}{z}} \sqrt{z} \sqrt{\frac{1}{1-iz}} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0075.01

$$\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1$$

01.25.16.0076.01

$$\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 1 \bigvee \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.25.16.0077.01

$$\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) = \frac{i\pi\sqrt{2z}}{4\sqrt{i-z}} \sqrt{\frac{i-z}{2z}} \left(\sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 1\right) + \frac{1}{2}\sqrt{i-z} \sqrt{-\frac{i}{z}} \sqrt{z} \sqrt{\frac{1}{iz+1}} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.25.16.0078.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.16.0015.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq 0$$

01.25.16.0016.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\sqrt{-z^2}}{4z}\left(\pi - 2i\sinh^{-1}\left(\frac{i}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.25.16.0021.02

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi \bigvee 0 < z < 1$$

01.25.16.0079.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.16.0020.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{-\frac{1}{z}}\sqrt{(1-z)z}\left(i\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0080.01

$$\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) > 0 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1$$

01.25.16.0081.01

$$\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) < -1 \bigvee -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.25.16.0082.01

$$\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right) = \frac{i\pi\sqrt{-2z}}{4\sqrt{i+z}}\sqrt{-\frac{i+z}{2z}}\left(1-\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{1-iz}}\,\sqrt{1-iz}\right)-\frac{1}{2}\sqrt{i+z}\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\sqrt{-z}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0083.01

$$\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) = -\frac{\pi i}{4}-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;\mathrm{Im}(z)\le 0 \lor \mathrm{Re}(z)\le 0 \land \mathrm{Im}(z)<1$$

01.25.16.0084.01

$$\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) = \frac{\pi i}{4}+\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;\mathrm{Im}(z)\ge 1 \bigvee 0<\arg(z)<\frac{\pi}{2}$$

01.25.16.0085.01

$$\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) = \frac{i\pi\sqrt{-z}}{4\sqrt{z-i}}\sqrt{\frac{i-z}{z}}\left(\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{iz+1}}\,\sqrt{iz+1}+1\right)-\frac{1}{2}\sqrt{z-i}\sqrt{\frac{1}{iz+1}}\sqrt{-\frac{i}{z}}\sqrt{-z}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.25.16.0086.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)+\frac{\pi i}{4}\;/;\;\mathrm{Im}(z)>0 \lor (z\in\mathbb{R} \land z<-1)$$

01.25.16.0013.02

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)-\frac{\pi i}{4}\;/;\;-\pi<\arg(z)\le 0 \bigvee -1<z<0$$

01.25.16.0014.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{\sqrt{-z-1}}{4\sqrt{z+1}}\left(2i\sinh^{-1}\left(\frac{i}{z}\right)-\pi\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.25.16.0087.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)-\frac{\pi i}{4}\;/;\;-\pi<\arg(z)\le 0$$

01.25.16.0088.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)+\frac{\pi i}{4}\;/;\;0<\arg(z)\le\pi$$

01.25.16.0089.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) == -\frac{\sqrt{-z^2}}{z}\left(\frac{1}{2}\, i \sinh^{-1}\left(\frac{i}{z}\right)+\frac{\pi}{4}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0090.01

$$\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right) == -\frac{\pi i}{4}+\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z)>0 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.16.0091.01

$$\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right) == \frac{\pi i}{4}-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.16.0092.01

$$\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right) == \frac{z}{2}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\,\sinh^{-1}\left(\frac{1}{z}\right)-\frac{i\pi}{4}\left(\sqrt{\frac{1}{z^2}}\, z+\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}-1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0093.01

$$\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) == \frac{\pi i}{4}+\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \le \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.16.0094.01

$$\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) == -\frac{\pi i}{4}-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z)<0 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.16.0095.01

$$\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) == \frac{i\pi}{4}\left(\sqrt{\frac{1}{z^2}}\, z-\sqrt{\frac{1}{i z+1}}\sqrt{i z+1}+1\right)+\frac{1}{2} z\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{i z+1}}\sqrt{i z+1}\,\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-1-z}{2z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.25.16.0011.02

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) == \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)+\frac{\pi i}{4} /; 0 \le \arg(z) < \pi \bigvee z < -1$$

01.25.16.0096.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.16.0012.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{i\sqrt{-z-1}\sqrt{-z}}{2\sqrt{z+1}}\sqrt{-\frac{1}{z}}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{4}\left(i - i\sqrt{-\frac{1}{z}}\sqrt{-z} - \frac{\sqrt{-z-1}}{\sqrt{z+1}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.25.16.0017.02

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \lor 0 < z < 1$$

01.25.16.0018.02

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) /; \operatorname{Im}(z) < 0 \lor z < 0 \lor z > 1$$

01.25.16.0019.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = -\frac{1}{2}z\sqrt{-\frac{1}{z^2}}\sqrt{1-z}\sqrt{\frac{1}{1-z}}\left(i\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-1-z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{-1-z^2}\right)$ and $\sinh^{-1}(z)$

01.25.16.0025.02

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee i z < -1$$

01.25.16.0097.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.16.0098.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi i}{2} - \sinh^{-1}(z) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.16.0099.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi i}{2} - \sinh^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.16.0100.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z}\sinh^{-1}(z)\right)$$

01.25.16.0026.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \sqrt{\frac{-i z-1}{1-i z}} \sqrt{\frac{1-i z}{-i z-1}} \left(\frac{\sqrt{z^2}}{z} \sinh^{-1}(z) + \frac{\pi \sqrt{-z^4}}{2 z^2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0028.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0$$

01.25.16.0101.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.16.0102.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.16.0103.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.25.16.0029.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi \sqrt{-z^2}}{2 z} - \sqrt{-\frac{1}{z^2}} \sqrt{-z^2} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0104.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.25.16.0105.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.25.16.0106.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z > 0)$$

01.25.16.0107.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.16.0108.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi\sqrt{-z^2}}{2\sqrt{z^2}} - \frac{z\sqrt{-z^2}}{\sqrt{z^2}}\sqrt{-\frac{1}{z^2}}\,\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0109.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.16.0110.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < 0) \bigvee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.25.16.0111.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z > 0) \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.25.16.0112.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.16.0113.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = \frac{\pi\sqrt{z^2+1}}{2\sqrt{-z^2-1}} - \frac{z\sqrt{z^2+1}}{\sqrt{-z^2-1}}\sqrt{-\frac{1}{z^2}}\,\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0114.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /;\ 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.16.0115.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.16.0116.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.16.0117.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.16.0118.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi \sqrt{-z^2 (z^2+1)}}{2 \sqrt{-z^2-1}} \sqrt{-\frac{1}{z^2}} - \frac{\sqrt{z} \sqrt{z^2+1}}{\sqrt{-z} \sqrt{-z^2-1}} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(2 z \sqrt{1+z^2}\right)$

Involving $\sinh^{-1}\left(2 z \sqrt{1+z^2}\right)$ and $\sinh^{-1}(z)$

01.25.16.0027.01

$$\sinh^{-1}\left(2 z \sqrt{z^2+1}\right) = 2 \sinh^{-1}(z) /;\ |\arg(z)| \leq \frac{\pi}{4} \bigvee -\pi < \arg(z) \leq -\frac{3\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi$$

01.25.16.0119.01

$$\sinh^{-1}\left(2z\sqrt{z^2+1}\right) = -\frac{\pi\sqrt{2z^2+1}\sqrt{z^4+z^2}}{2\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}}\left(\frac{\sqrt{-z^2}}{z} + i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{1}{1-i\sqrt{2}z}}\sqrt{1-i\sqrt{2}z} - i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}iz+1}}\sqrt{\sqrt{2}iz+1} + \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{2\sqrt{2z^2+1}\sqrt{z^4+z^2}}{\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}}\sinh^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0120.01

$$\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) = 2\sinh^{-1}\left(\frac{1}{z}\right) /; |z| \geq \sqrt{2} \bigwedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.16.0121.01

$$\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) = -2\sinh^{-1}\left(\frac{1}{z}\right) /; |z| \geq \sqrt{2} \bigwedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.25.16.0122.01

$$\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) = \frac{\sqrt{-z^2-2}\sqrt{z^2+1}}{2\sqrt{1-iz}(-i+z)\left(-\frac{i}{z}\right)^{5/2}\sqrt{-(z^2+1)(z^2+2)}}\sqrt{\frac{i-z}{z}}\sqrt{\frac{z^2+1}{z^4}}\left(\pi\left(\sqrt{-\frac{1}{z^2}}z - \frac{z^3}{z^2+1}\sqrt{\frac{z^2+1}{z^4}}\sqrt{-\frac{z^2+1}{z^2}} + i\sqrt{\frac{-i\sqrt{2}+z}{z}}\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{z}{-i\sqrt{2}+z}} - i\sqrt{-iz}\sqrt{\frac{i}{z}}\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{z}{i\sqrt{2}+z}}\right) + 4\sinh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1+z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1+z^2}-1\right)/2}\right)$ and $\sinh^{-1}(z)$

01.25.16.0030.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1+z^2}-1}{2}}\right) = \frac{1}{2}\sinh^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.25.16.0123.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1+z^2}-1}{2}}\right) = -\frac{1}{2}\sinh^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.25.16.0031.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1+z^2}-1}{2}}\right) = \frac{\sqrt{z^2}}{2z}\sinh^{-1}(z)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1+z^2}-1}\Big/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1+z^2}-1}\Big/\sqrt{2z^2}\right)$ and $\sinh^{-1}(z)$

01.25.16.0032.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{z^2+1}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2}\sinh^{-1}(z)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1+z^2}-1\right)\Big/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1+z^2}-1\right)\Big/\left(2z^2\right)}\right)$ and $\sinh^{-1}(z)$

01.25.16.0124.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1+z^2}-1}{2z^2}}\right) = \frac{1}{2}\sinh^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2+1}-z}\Big/\sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2+1}-z}\Big/\sqrt{2z}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0125.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1) \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.16.0126.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = -\frac{\pi\,i}{2} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.16.0127.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = -\frac{\pi\,i}{2} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.16.0128.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = \frac{\pi\,i}{2} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.16.0129.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) =$$

$$\frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2} + \sqrt{-z} - i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)\right) + \frac{\sqrt{-i\,z-1}\,\sqrt{i\,z-1}}{2\sqrt{z}}\sqrt{\frac{1}{z}}\,\sqrt{\frac{z^2}{z^2+1}}\,\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2+1}-z\right)\Big/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2+1}-z\right)/(2z)}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.25.16.0130.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right)=\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\text{ /; }\operatorname{Re}(z)>0\lor(i\,z\in\mathbb{R}\land 0<i\,z<1)$$

01.25.16.0131.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right)=-\frac{\pi i}{2}-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\text{ /; }\frac{\pi}{2}<\arg(z)<\pi\bigvee(i\,z\in\mathbb{R}\land -1<i\,z<0)$$

01.25.16.0132.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right)=\frac{\pi i}{2}-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\text{ /; }-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(i\,z\in\mathbb{R}\land i\,z>1)\bigvee(z\in\mathbb{R}\land z<0)$$

01.25.16.0133.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right)=-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\text{ /; }(i\,z\in\mathbb{R}\land i\,z<-1)$$

01.25.16.0134.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right)=$$

$$\frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2}+\sqrt{-z}-2\,i\sqrt{\frac{1}{z}}\,z-i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1}-3\right)\right)+\frac{i\sqrt{(-i+z)^2}}{2\sqrt{z^2+1}}\sqrt{\frac{z}{i-z}}\sqrt{\frac{i+z}{z}}\sinh^{-1}\left(\frac{1}{z}\right)$$

Products, sums, and powers of the direct function

Sums of the direct function

01.25.16.0033.01

$$\sinh^{-1}(x)+\sinh^{-1}(y)=\sinh^{-1}\left(\sqrt{y^2+1}\,x+\sqrt{x^2+1}\,y\right)\text{ /; }x\in\mathbb{R}\bigwedge y\in\mathbb{R}$$

01.25.16.0135.01

$$\sinh^{-1}(x)+\sinh^{-1}(y)=$$
$$\frac{x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}}{\sqrt{\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)^2}}\sinh^{-1}\left(\sqrt{y^2+1}\,x+\sqrt{x^2+1}\,y\right)-\frac{1}{2}\pi\,i\left(1-\frac{x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}}{\sqrt{\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)^2}}\right)-$$
$$\pi\,i\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{y^2+1}-y\right)}{2\,\pi}\right\rfloor\left(1-\frac{x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}}{\sqrt{\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)^2}}\right)+$$
$$i\,\pi\left(\frac{x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}}{\sqrt{\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(\sqrt{x^2+1}-x\right)-\arg\left(\sqrt{y^2+1}-y\right)+\pi}{2\,\pi}\right\rfloor$$

01.25.16.0136.01

$$\sinh^{-1}(x)+\sinh^{-1}(y)=\sinh^{-1}\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)}{\pi}\right\rfloor}\left(\sqrt{y^2+1}\,x+\sqrt{x^2+1}\,y\right)\right)+$$
$$\frac{1}{2}\,i\,\pi\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{y^2+1}-y\right)}{2\,\pi}\right\rfloor+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)}{\pi}\right\rfloor}+\right.$$
$$\left.2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(x\,y+\sqrt{x^2+1}\,\sqrt{y^2+1}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{y^2+1}-y\right)}{2\,\pi}\right\rfloor-1\right)$$

Differences of the direct function

01.25.16.0034.01

$$\sinh^{-1}(x)-\sinh^{-1}(y)=\sinh^{-1}\left(x\sqrt{y^2+1}-y\sqrt{x^2+1}\right)\;/;\;x\in\mathbb{R}\land y\in\mathbb{R}$$

01.25.16.0137.01

$$\sinh^{-1}(x)-\sinh^{-1}(y)=-\frac{\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)^2}}\sinh^{-1}\!\left(\sqrt{x^2+1}\,y-x\sqrt{y^2+1}\right)-i\,\pi\left\lfloor\frac{\arg\!\left(\sqrt{x^2+1}-x\right)+\arg\!\left(y+\sqrt{y^2+1}\right)}{2\,\pi}\right\rfloor\left(1-\frac{\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)^2}}\right)-\frac{1}{2}\,i\,\pi\left(1-\frac{\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)^2}}\right)+i\,\pi\left(\frac{\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)^2}}+1\right)\left\lfloor\frac{-\arg\!\left(\sqrt{x^2+1}-x\right)-\arg\!\left(y+\sqrt{y^2+1}\right)+\pi}{2\,\pi}\right\rfloor$$

01.25.16.0138.01

$$\sinh^{-1}(x)-\sinh^{-1}(y)=\sinh^{-1}\!\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)}{\pi}\right\rfloor}\left(x\sqrt{y^2+1}-\sqrt{x^2+1}\,y\right)\right)+\frac{1}{2}\,i\,\pi\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\!\left(\sqrt{x^2+1}-x\right)+\arg\!\left(y+\sqrt{y^2+1}\right)}{2\,\pi}\right\rfloor+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{y^2+1}-x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\!\left(\sqrt{x^2+1}-x\right)+\arg\!\left(y+\sqrt{y^2+1}\right)}{2\,\pi}\right\rfloor-1\right)$$

Linear combinations of the direct function

01.25.16.0139.01

$$a\sinh^{-1}(x)+b\sinh^{-1}(y)=\log\!\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\!\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\!\left(\left(y+\sqrt{y^2+1}\right)^b\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\!\left(a\log\!\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\!\left(b\log\!\left(y+\sqrt{y^2+1}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.25.16.0140.01

$$a\sinh^{-1}(x)+b\sinh^{-1}(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(y+\sqrt{y^2+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(y+\sqrt{y^2+1}\right)^{-b}\left(\left(x+\sqrt{x^2+1}\right)^{2a}\left(y+\sqrt{y^2+1}\right)^{2b}-1\right)\right)-\frac{1}{2}i$$

$$(-1)^{-\left\lfloor -\frac{\arg\left(\left(y+\sqrt{y^2+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b-i\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(y+\sqrt{y^2+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+\right.\right.}{\cdots}\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b\right)}{2\pi}+\frac{\arg\left(\left(y+\sqrt{y^2+1}\right)^b\left(x+\sqrt{x^2+1}\right)^a+i\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(y+\sqrt{y^2+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y^2+1}\right)^b-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+\right.\right.}{\cdots}\right.}$$

$$\left.\right)\pi-2i\pi\left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(y+\sqrt{y^2+1}\right)^b\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor \frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(b\log\left(y+\sqrt{y^2+1}\right)\right)}{2\pi}\right\rfloor\right)$$

Related transformations

Sums involving the direct function

Involving $\log(z)$

01.25.16.0141.01

$$\sinh^{-1}(x)+\log(y)=\log\left(\left(x+\sqrt{x^2+1}\right)y\right)-2i\pi\left\lfloor \frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg(y)+\pi}{2\pi}\right\rfloor$$

01.25.16.0142.01

$$\sinh^{-1}(x)+\log(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,y-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)y-1\right)}{2\pi}\right\rfloor}\sinh^{-1}\left(\frac{\left(x+\sqrt{x^2+1}\right)^2y^2-1}{2\left(x+\sqrt{x^2+1}\right)y}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,y-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)y-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y-i\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,y-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)y-1\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right.}{\pi}\right.}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y+i\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,y-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)y-1\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)y\right.}{\pi}\right.}$$

$$\left.\vphantom{\frac{1}{2}}\right)\pi-2\,i\,\pi\left\lfloor \frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg(y)+\pi}{2\pi}\right\rfloor$$

Involving $\sin^{-1}(z)$

01.25.16.0143.01

$$\sinh^{-1}(x)+\sin^{-1}(y)=\log\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)-$$

$$2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor\right)$$

01.25.16.0144.01

$$\sinh^{-1}(x)+\sin^{-1}(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(i\,y+\sqrt{1-y^2}\right)^{i}\left(\left(x+\sqrt{x^2+1}\right)^2\left(i\,y+\sqrt{1-y^2}\right)^{-2i}-1\right)}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-i\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{\ldots}\right.\right.}{\ldots}\right.}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}+i\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{\ldots}\right.\right.}{\ldots}\right.}$$

$$\left.\right)\pi-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor\right)$$

01.25.16.0145.01

$$\sinh^{-1}(x)+i\sin^{-1}(y)=\frac{i\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}\sin^{-1}\left(\sqrt{x^2+1}\,y-i\,x\sqrt{1-y^2}\right)+$$
$$i\,\pi\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\left(1-\frac{i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}\right)+$$
$$\frac{1}{2}\,i\,\pi\left(1-\frac{i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}\right)-$$
$$\pi\,i\left(\frac{i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(i\,y+\sqrt{1-y^2}\right)+\pi}{2\pi}\right\rfloor$$

01.25.16.0146.01

$$\sinh^{-1}(x)+i\sin^{-1}(y)=\sinh^{-1}\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\left(\sqrt{1-y^2}\,x+i\sqrt{x^2+1}\,y\right)\right)-$$
$$\frac{1}{2}\,\pi\,i\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}+\right.$$
$$\left.2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor-1\right)$$

Involving $\cos^{-1}(z)$

01.25.16.0147.01

$$\sinh^{-1}(x)+\cos^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^i\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)+\log\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^i\right)+\frac{\pi}{2}$$

01.25.16.0148.01

$$\sinh^{-1}(x)+\cos^{-1}(y)=-2\,i\,\pi$$

$$\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(i\,y+\sqrt{1-y^2}\right)^{-i}\left(\left(x+\sqrt{x^2+1}\right)^2\left(i\,y+\sqrt{1-y^2}\right)^{2\,i}-1\right)}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-i\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right.\right.}{}\right.}$$

$$-$$

$$(-1)^{\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}+i\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right.\right.}{}\right.}$$

$$\left.\right)$$

$$\pi+\frac{\pi}{2}$$

01.25.16.0149.01

$$\sinh^{-1}(x)+i\cos^{-1}(y)=\frac{\pi i}{2}-\frac{i\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}\sin^{-1}\left(i\sqrt{1-y^2}\,x+\sqrt{x^2+1}\,y\right)+ i\,\pi\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-y^2}-i\,y\right)}{2\pi}\right\rfloor\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}\right)+ \frac{1}{2}\,i\,\pi\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}\right)- i\,\pi\left(\frac{\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\sqrt{1-y^2}-i\,y\right)+\pi}{2\pi}\right\rfloor$$

01.25.16.0150.01

$$\sinh^{-1}(x)+i\cos^{-1}(y)=\sinh^{-1}\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}\left(x\sqrt{1-y^2}-i\sqrt{x^2+1}\,y\right)\right)+ \frac{1}{2}\,i\,\pi\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor+ (-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\right)$$

Involving $\tan^{-1}(z)$

01.25.16.0151.01

$$\sinh^{-1}(x)+\tan^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{-\frac{i}{2}}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(\log(i\,y+1))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\right)\right)}{2\,\pi}\right\rfloor\right)-$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left((1-i\,y)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(1-i\,y))}{2\,\pi}\right\rfloor\right)+$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}\right)$$

01.25.16.0152.01

$$\sinh^{-1}(x)+\tan^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{-\frac{i}{2}}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(\log(i\,y+1))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\right)\right)}{2\,\pi}\right\rfloor\right)-$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left((1-i\,y)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(1-i\,y))}{2\,\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{i}{2}}\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{i/2}-1\right)}{2\,\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2(1-i\,y)^{i}\,(i\,y+1)^{-i}-1\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{i}{2}}\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{i/2}-1\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}-i\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{i}{2}}\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{i/2}-1\right)}{2\pi}\right\rfloor+\left\lfloor -\right.}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{i}{2}}\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}+i\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{i}{2}}\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{i/2}-1\right)}{2\pi}\right\rfloor+\left\lfloor -\right.}$$

$$\left.\right)$$

$$\pi$$

01.25.16.0153.01

$$\sinh^{-1}(x)+i\tan^{-1}(y)=\frac{i\sqrt{\frac{\left(i\,x-\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{i\,x-\sqrt{x^2+1}\;y}\sin^{-1}\left(\frac{i\,x\,y+\sqrt{x^2+1}}{\sqrt{y^2+1}}\right)-$$

$$\frac{\pi\,i\sqrt{\frac{\left(i\,x-\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{2\left(i\,x-\sqrt{x^2+1}\;y\right)}-\pi\,i\left(\frac{\sqrt{\frac{\left(i\,x-\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{i\,x-\sqrt{x^2+1}\;y}+1\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}\;-x\right)+\arg\left(\frac{i+y}{\sqrt{y^2+1}}\right)}{2\pi}\right\rfloor+$$

$$\pi\,i\left(\frac{\sqrt{\frac{\left(i\,x-\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{i\,x-\sqrt{x^2+1}\;y}-1\right)\left\lfloor-\frac{\arg\left(\sqrt{x^2+1}\;-x\right)+\arg\left(\frac{i+y}{\sqrt{y^2+1}}\right)-\pi}{2\pi}\right\rfloor$$

01.25.16.0154.01

$$\sinh^{-1}(x)+i\tan^{-1}(y)=\sinh^{-1}\left(\frac{(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x-\sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi}\right\rfloor}\left(i\sqrt{x^2+1}-x y\right)}{\sqrt{y^2+1}}\right)-\frac{1}{2}\pi i\left(2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x-\sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi}\right\rfloor}\right)\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+y}{\sqrt{y^2+1}}\right)}{2\pi}\right\rfloor+$$

$$(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x-\sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi}\right\rfloor}-2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x-\sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi}\right\rfloor}\right))\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+y}{\sqrt{y^2+1}}\right)}{2\pi}\right\rfloor)$$

Involving $\cot^{-1}(z)$

01.25.16.0155.01

$$\sinh^{-1}(x)+\cot^{-1}(y)=-2 i\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)\right)}{2\pi}\right\rfloor\right)-$$

$$2 i\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1-\frac{i}{y}\right)\right)}{2\pi}\right\rfloor\right)+$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)$$

01.25.16.0156.01

$$\sinh^{-1}(x)+\cot^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)\right)}{2\pi}\right\rfloor\right)-$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1-\frac{i}{y}\right)\right)}{2\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\left(1-\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2\left(1-\frac{i}{y}\right)^{i}\left(1+\frac{i}{y}\right)^{-i}-1\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\left(1-\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}-1\right)}{2\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\left(1-\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}-1\right)}{2\pi}\right\rfloor+\lfloor-\mathrm{ar}}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\left(1-\frac{i}{y}\right)^{i/2}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\left(1-\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}-1\right)}{2\pi}\right\rfloor+\left\lfloor -\ldots\right.}$$

$$\Bigg)$$

$$\pi$$

01.25.16.0157.01

$$\sinh^{-1}(x)+i\cot^{-1}(y)=\frac{\sqrt{\frac{\left(\sqrt{x^2+1}-i\,x\,y\right)^2}{y^2+1}}\sqrt{1+\frac{1}{y^2}}\;y}{i\sqrt{x^2+1}+x\,y}\sin^{-1}\left(\frac{\frac{i\,x}{y}+\sqrt{x^2+1}}{\sqrt{1+\frac{1}{y^2}}}\right)-$$

$$\frac{\pi\sqrt{1+\frac{1}{y^2}}\sqrt{\frac{\left(\sqrt{x^2+1}-i\,x\,y\right)^2}{y^2+1}}\;y}{2\,i\sqrt{x^2+1}+2\,x\,y}+i\,\pi\left(\frac{\sqrt{\frac{\left(\sqrt{x^2+1}-i\,x\,y\right)^2}{y^2+1}}\sqrt{1+\frac{1}{y^2}}\;y}{\sqrt{x^2+1}-i\,x\,y}+1\right)\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\frac{i-\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{2\pi}\right\rfloor-$$

$$\pi\,i\left(\frac{\sqrt{1+\frac{1}{y^2}}\;y\sqrt{\frac{\left(\sqrt{x^2+1}-i\,x\,y\right)^2}{y^2+1}}}{\sqrt{x^2+1}-i\,x\,y}-1\right)\left\lfloor-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\frac{i-\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)-\pi}{2\pi}\right\rfloor$$

01.25.16.0158.01

$$\sinh^{-1}(x)+i\cot^{-1}(y)=\sinh^{-1}\left(\frac{(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{\frac{\sqrt{x^2+1}}{y}-i x}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}\left(-i\sqrt{x^2+1}+\frac{x}{y}\right)}{\sqrt{1+\frac{1}{y^2}}}\right)+\frac{1}{2}i\pi\left(2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{\frac{\sqrt{x^2+1}}{y}-i x}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\frac{i-\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{2\pi}\right\rfloor+\right.$$

$$\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{\frac{\sqrt{x^2+1}}{y}-i x}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}-2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{\frac{\sqrt{x^2+1}}{y}-i x}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\frac{i-\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{2\pi}\right\rfloor\right)$$

Involving $\csc^{-1}(z)$

01.25.16.0159.01

$$\sinh^{-1}(x)+\csc^{-1}(y)=\log\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)-$$

$$2i\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor\right)$$

01.25.16.0160.01

$$\sinh^{-1}(x)+\csc^{-1}(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-2i}-1\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(x+\sqrt{\ldots}\right.}{\ldots}\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(x+\sqrt{\ldots}\right.}{\ldots}\right.}$$

$$\left.\right)\left(\pi-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)+\pi}{2\pi}\right\rfloor+\right.\right.$$

$$\left.\left.\left\lfloor\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor\right)\right)$$

01.25.16.0161.01

$$\sinh^{-1}(x) + i\csc^{-1}(y) = \frac{\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}}\sinh^{-1}\left(x\sqrt{1-\frac{1}{y^2}} + \frac{i\sqrt{x^2+1}}{y}\right) + i\,\pi\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\,\pi}\right\rfloor\left(1 - \frac{\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}}\right) + \frac{1}{2}\,i\,\pi\left(1 - \frac{\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}}\right) + i\,(-\pi)\left(\frac{\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i\,x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}} + 1\right)\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right) - \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right) + \pi}{2\,\pi}\right\rfloor$$

01.25.16.0162.01

$$\sinh^{-1}(x)+i\csc^{-1}(y)=\sinh^{-1}\left((-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\left(x\sqrt{1-\frac{1}{y^2}}+\frac{i\sqrt{x^2+1}}{y}\right)\right)-$$
$$\frac{1}{2}\pi i\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}+\right.$$
$$\left.2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor-1\right)$$

Involving $\sec^{-1}(z)$

01.25.16.0163.01

$$\sinh^{-1}(x)+\sec^{-1}(y)=$$
$$-2i\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^i\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2\pi}\right\rfloor\right)+$$
$$\log\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^i\right)+\frac{\pi}{2}$$

01.25.16.0164.01

$$\sinh^{-1}(x)+\sec^{-1}(y)=$$
$$-2i\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^i\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{\pi}\right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{2i}-1\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}}{2\left(x+\sqrt{x^2+1}\right)}\right)-\frac{1}{2}i$$

$$(-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}\right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-i\right)\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\cdots\right.\right.}{}\cdots\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}+i\right)\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\cdots\right.\right.}{}\cdots\right.}$$

$$\left.\right)$$

$$\pi+\frac{\pi}{2}$$

01.25.16.0165.01

$$\sinh^{-1}(x)+i\sec^{-1}(y)=\frac{\pi i}{2}+\frac{\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}}{\sqrt{\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)^2}}\sinh^{-1}\left(x\sqrt{1-\frac{1}{y^2}}-\frac{i\sqrt{x^2+1}}{y}\right)+$$

$$i\pi\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}-\frac{i}{y}\right)}{2\pi}\right\rfloor\left(1-\frac{\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}}{\sqrt{\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)^2}}\right)+$$

$$\frac{1}{2}i\pi\left(1-\frac{\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}}{\sqrt{\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)^2}}\right)-$$

$$i\pi\left(\frac{\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}}{\sqrt{\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\sqrt{1-\frac{1}{y^2}}-\frac{i}{y}\right)+\pi}{2\pi}\right\rfloor$$

01.25.16.0166.01

$$\sinh^{-1}(x) + i\sec^{-1}(y) = \frac{1}{2}\pi i \left(2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right\rfloor + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor} + 2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right\rfloor\right) + \sinh^{-1}\left((-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor}\left(x\sqrt{1-\frac{1}{y^2}} - \frac{i\sqrt{x^2+1}}{y}\right)\right)$$

Involving $\cosh^{-1}(z)$

01.25.16.0035.01

$$\sinh^{-1}(x) + \cosh^{-1}(y) = \sinh^{-1}\left(x y + \sqrt{y^2-1}\sqrt{x^2+1}\right) /; y > 0$$

01.25.16.0036.01

$$\sinh^{-1}(x) + \cosh^{-1}(y) = \pi i - \sinh^{-1}\left(x y + \sqrt{y^2-1}\sqrt{x^2+1}\right) /; -1 < y < 0$$

01.25.16.0037.01

$$\sinh^{-1}(x) + \cosh^{-1}(y) = \sinh^{-1}\left(\sqrt{x^2+1}\sqrt{y^2-1} - x y\right) + \pi i /; y < -1$$

01.25.16.0167.01

$$\sinh^{-1}(x)+\cosh^{-1}(y)=\sinh^{-1}\left(i\,(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(i\,x\,y+i\,\sqrt{x^2+1}\,\sqrt{y-1}\,\sqrt{y+1}\right)}{\pi}\right\rfloor}\left(\sqrt{y-1}\,\sqrt{y+1}\,x+\sqrt{x^2+1}\,y\right)\right)-$$

$$\frac{1}{2}\,\pi\,i\left(\frac{1}{2}\left(1-(-1)^{-\left\lfloor -\frac{\arg(1-y)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor+\right.\right.$$

$$\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\right)-$$

$$\frac{1}{2}\left(1+(-1)^{-\left\lfloor -\frac{\arg(1-y)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}\,-i\,x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(\sqrt{x^2+1}\,-x\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}\,-i\,x\,y\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}\,-i\,x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,-x\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\right)\right)$$

Involving $\tanh^{-1}(z)$

01.25.16.0168.01

$$\sinh^{-1}(x)+\tanh^{-1}(y)=\frac{\sqrt{\frac{\left(i\,x+i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{x+\sqrt{x^2+1}\;y}\sin^{-1}\left(\frac{x\,y+\sqrt{x^2+1}}{\sqrt{1-y^2}}\right)-$$

$$\frac{\pi\,i\sqrt{\frac{\left(i\,x+i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{2\left(i\,x+i\sqrt{x^2+1}\;y\right)}-\pi\,i\left(\frac{\sqrt{\frac{\left(i\,x+i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{i\,x+i\sqrt{x^2+1}\;y}+1\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-i\,y}{\sqrt{1-y^2}}\right)}{2\pi}\right\rfloor+$$

$$\pi\,i\left(\frac{\sqrt{\frac{\left(i\,x+i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{i\,x+i\sqrt{x^2+1}\;y}-1\right)\left\lfloor-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-i\,y}{\sqrt{1-y^2}}\right)-\pi}{2\pi}\right\rfloor$$

01.25.16.0169.01

$$\sinh^{-1}(x)+\tanh^{-1}(y)=$$

$$\sinh^{-1}\left(\frac{i\,(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x+i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}\left(x\,y+\sqrt{x^2+1}\right)}{\sqrt{1-y^2}}\right)-\frac{1}{2}\pi\,i\left(2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x+i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-i\,y}{\sqrt{1-y^2}}\right)}{2\pi}\right\rfloor+\right.$$

$$\left.(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x+i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}-2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x+i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-i\,y}{\sqrt{1-y^2}}\right)}{2\pi}\right\rfloor\right)$$

Involving $\coth^{-1}(z)$

01.25.16.0170.01

$$\sinh^{-1}(x)+\coth^{-1}(y)=$$

$$\frac{\sqrt{-\frac{(y^2+1)x^2+2\sqrt{x^2+1}\;y\,x+1}{y^2-1}}\;\sqrt{1-\frac{1}{y^2}}\;y}{x\,y+\sqrt{x^2+1}}\sin^{-1}\!\left(\frac{\frac{x}{y}+\sqrt{x^2+1}}{\sqrt{1-\frac{1}{y^2}}}\right)-\frac{\pi\sqrt{1-\frac{1}{y^2}}\;\sqrt{-\frac{(y^2+1)x^2+2\sqrt{x^2+1}\;y\,x+1}{y^2-1}}\;y}{2\left(x\,y+\sqrt{x^2+1}\right)}-$$

$$\pi\,i\left(1-\frac{i\sqrt{1-\frac{1}{y^2}}\;y\sqrt{-\frac{(y^2+1)x^2+2\sqrt{x^2+1}\;y\,x+1}{y^2-1}}}{x\,y+\sqrt{x^2+1}}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-\frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{2\pi}\right\rfloor-$$

$$\pi\,i\left(\frac{i\sqrt{-\frac{(y^2+1)x^2+2\sqrt{x^2+1}\;y\,x+1}{y^2-1}}\;\sqrt{1-\frac{1}{y^2}}\;y}{x\,y+\sqrt{x^2+1}}+1\right)\left\lfloor-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-\frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)-\pi}{2\pi}\right\rfloor$$

01.25.16.0171.01

$$\sinh^{-1}(x)+\coth^{-1}(y)=$$

$$\sinh^{-1}\left(\frac{i\,(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x+\frac{i\sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}\left(\frac{x}{y}+\sqrt{x^2+1}\right)}{\sqrt{1-\frac{1}{y^2}}}\right)-\frac{1}{2}\pi\,i\left(2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x+\frac{i\sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-\frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{2\pi}\right\rfloor+\right.$$

$$\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x+\frac{i\sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}-2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x+\frac{i\sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i-\frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{2\pi}\right\rfloor\right)$$

Involving $\operatorname{csch}^{-1}(z)$

01.25.16.0172.01

$$\operatorname{csch}^{-1}(y)+\sinh^{-1}(x)=$$
$$\frac{\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}}{\sqrt{\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)^2}}\sinh^{-1}\left(\sqrt{1+\frac{1}{y^2}}\;x+\frac{\sqrt{x^2+1}}{y}\right)-\frac{1}{2}\pi\,i\left(1-\frac{\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}}{\sqrt{\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)^2}}\right)-$$
$$\pi\,i\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1+\frac{1}{y^2}}-\frac{1}{y}\right)}{2\pi}\right\rfloor\left(1-\frac{\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}}{\sqrt{\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)^2}}\right)+$$
$$i\,\pi\left(\frac{\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}}{\sqrt{\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(\sqrt{x^2+1}-x\right)-\arg\left(\sqrt{1+\frac{1}{y^2}}-\frac{1}{y}\right)+\pi}{2\pi}\right\rfloor$$

01.25.16.0173.01

$$\sinh^{-1}(x)+\operatorname{csch}^{-1}(y)=\sinh^{-1}\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\left(\sqrt{1+\frac{1}{y^2}}\;x+\frac{\sqrt{x^2+1}}{y}\right)\right)+$$
$$\frac{1}{2}\pi\,i\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1+\frac{1}{y^2}}-\frac{1}{y}\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)}{\pi}\right\rfloor}+\right.$$
$$\left.2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{x}{y}+\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1+\frac{1}{y^2}}-\frac{1}{y}\right)}{2\pi}\right\rfloor-1\right)$$

Involving $\operatorname{sech}^{-1}(z)$

01.25.16.0174.01

$$\sinh^{-1}(x)+\operatorname{sech}^{-1}(y)=\sinh^{-1}\left(i\,(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+i\sqrt{x^2+1}\,\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}\right)}{\pi}\right\rfloor}\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}\,x+\frac{\sqrt{x^2+1}}{y}\right)\right)-$$

$$\frac{1}{2}\pi i\left(\frac{1}{2}\left(1-(-1)^{-\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+\right.\right.$$

$$\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i x}{y}+\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor\right)-$$

$$\frac{1}{2}\left(1+(-1)^{-\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}-\frac{i x}{y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor\right)\right)$$

Differences involving the direct function

Involving log(*z*)

01.25.16.0175.01

$$\sinh^{-1}(x)-\log(y)=\log\left(\frac{x+\sqrt{x^2+1}}{y}\right)-2\,i\,\pi\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)+\arg(y)+\pi}{2\pi}\right\rfloor$$

01.25.16.0176.01

$$\sinh^{-1}(x)-\log(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(-\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}\right\rfloor}\sinh^{-1}\left(\frac{\left(\frac{\left(x+\sqrt{x^2+1}\right)^2}{y^2}-1\right)y}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(-\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}-i\right)}{2\pi}+\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(-\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}-i\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{\pi}\right\rfloor}-$$

$$\left.(-1)^{\left\lfloor -\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}+i\right)}{2\pi}+\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(-\frac{i\left(x+\sqrt{x^2+1}\right)}{y}-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}+i\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(\frac{x+\sqrt{x^2+1}}{y}\right)}{\pi}\right\rfloor}\right)$$

$$\pi-2\,i\,\pi\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)+\arg(y)+\pi}{2\pi}\right\rfloor$$

Involving $\sin^{-1}(z)$

01.25.16.0177.01

$$\sinh^{-1}(x)-\sin^{-1}(y)=\log\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)-$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.25.16.0178.01

$$\sinh^{-1}(x)-\sin^{-1}(y)=(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(i\,y+\sqrt{1-y^2}\right)^{-i}\left(\left(x+\sqrt{x^2+1}\right)^2\left(i\,y+\sqrt{1-y^2}\right)^{2\,i}-1\right)}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-i\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor+\lfloor-\arg((x+\sqrt{x^2+1}}$$

$$-$$

$$(-1)^{\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}+i\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{i}-1\right)}{2\,\pi}\right\rfloor+\lfloor-\arg((x+\sqrt{x^2+1}}$$

$$\left.\vphantom{\frac{1}{2}}\right)\pi-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)+\pi}{2\,\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.25.16.0179.01

$$\sinh^{-1}(x) - i\sin^{-1}(y) = -\frac{i\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}\sin^{-1}\!\left(i\sqrt{1-y^2}\,x+\sqrt{x^2+1}\,y\right)+ i\,\pi\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-y^2}-i\,y\right)}{2\,\pi}\right\rfloor\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}\right)+ \frac{1}{2}\,i\,\pi\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}\right)- i\,\pi\left(\frac{\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\sqrt{1-y^2}-i\,y\right)+\pi}{2\,\pi}\right\rfloor$$

01.25.16.0180.01

$$\sinh^{-1}(x) - i\sin^{-1}(y) = \sinh^{-1}\!\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}\left(x\sqrt{1-y^2}-i\sqrt{x^2+1}\,y\right)\right)- \frac{1}{2}\,i\,\pi\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-y^2}-i\,y\right)}{2\,\pi}\right\rfloor+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}+ 2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2}-i\,x\,y\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-y^2}-i\,y\right)}{2\,\pi}\right\rfloor-1\right)$$

Involving $\cos^{-1}(z)$

01.25.16.0181.01

$$\sinh^{-1}(x) - \cos^{-1}(y) = -2 i \pi \left(\left\lfloor \frac{-\arg\left(x + \sqrt{x^2+1}\right) - \arg\left(\left(i y + \sqrt{1-y^2}\right)^{-i}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\operatorname{Re}\left(\log\left(i y + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(x + \sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor \right) + \log\left(\left(x + \sqrt{x^2+1}\right)\left(i y + \sqrt{1-y^2}\right)^{-i}\right) - \frac{\pi}{2}$$

01.25.16.0182.01

$$\sinh^{-1}(x)-\cos^{-1}(y)=-2\,i\,\pi$$

$$\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(i\,y+\sqrt{1-y^2}\right)^{i}\left(\left(x+\sqrt{x^2+1}\right)^2\left(i\,y+\sqrt{1-y^2}\right)^{-2\,i}-1\right)}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-i\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{\cdots}\right.\right.}{\cdots}\right.}$$

$$-$$

$$(-1)^{\left\lfloor\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}+i\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)}{2\,\pi}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{\cdots}\right.\right.}{\cdots}\right.}$$

$$\left.\right)$$

$$\pi-\frac{\pi}{2}$$

01.25.16.0183.01

$$\sinh^{-1}(x) - i\cos^{-1}(y) = -\frac{\pi i}{2} + \frac{i\left(i\,x\,y + \sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\sqrt{\left(i\,x\,y + \sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}} \sin^{-1}\left(\sqrt{x^2+1}\,y - i\,x\sqrt{1-y^2}\right) + i\,\pi\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\left(1-\frac{i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}\right) + \frac{1}{2}\,i\,\pi\left(1-\frac{i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}\right) - \pi\,i\left(\frac{i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}}{\sqrt{\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(i\,y+\sqrt{1-y^2}\right)+\pi}{2\pi}\right\rfloor$$

01.25.16.0184.01

$$\sinh^{-1}(x) - i\cos^{-1}(y) = \sinh^{-1}\left((-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\left(\sqrt{1-y^2}\,x + i\sqrt{x^2+1}\,y\right)\right) - \frac{1}{2}\,\pi\,i\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor + (-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor} + 2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(i\,x\,y+\sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\right)$$

Involving $\tan^{-1}(z)$

01.25.16.0185.01

$$\sinh^{-1}(x)-\tan^{-1}(y)=$$

$$-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left((1-i\,y)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(\log(1-i\,y))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor\right)-$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{i/2}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\right)\right)}{2\,\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(i\,y+1))}{2\,\pi}\right\rfloor\right)+\log\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)$$

01.25.16.0186.01

$$\sinh^{-1}(x)-\tan^{-1}(y)=$$

$$-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left((1-i\,y)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(\log(1-i\,y))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor\right)-$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{i/2}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(i\,y+1))}{2\,\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\,\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2(1-i\,y)^{-i}\,(i\,y+1)^{i}-1\right)(1-i\,y)^{i/2}\,(i\,y+1)^{-\frac{i}{2}}}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-i\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\pi}\right\rfloor+\lfloor -}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}+i\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\,(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}-1\right)}{2\pi}\right\rfloor+\lfloor -}$$

$$\left.\vphantom{\frac{1}{2}}\right)$$

$$\pi$$

01.25.16.0187.01

$$\sinh^{-1}(x)-i\tan^{-1}(y)=\frac{i\sqrt{\frac{\left(i\,x+\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{i\,x+\sqrt{x^2+1}\;y}\sin^{-1}\left(\frac{\sqrt{x^2+1}\;-i\,x\,y}{\sqrt{y^2+1}}\right)-$$

$$\frac{i\,\pi\sqrt{\frac{\left(i\,x+\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{2\left(i\,x+\sqrt{x^2+1}\;y\right)}-i\,\pi\left(\frac{\sqrt{\frac{\left(i\,x+\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{i\,x+\sqrt{x^2+1}\;y}+1\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}\;-x\right)+\arg\left(\frac{i-y}{\sqrt{y^2+1}}\right)}{2\pi}\right\rfloor+$$

$$i\,\pi\left(\frac{\sqrt{\frac{\left(i\,x+\sqrt{x^2+1}\;y\right)^2}{y^2+1}}\;\sqrt{y^2+1}}{i\,x+\sqrt{x^2+1}\;y}-1\right)\left\lfloor-\frac{\arg\left(\sqrt{x^2+1}\;-x\right)+\arg\left(\frac{i-y}{\sqrt{y^2+1}}\right)-\pi}{2\pi}\right\rfloor$$

01.25.16.0188.01

$$\sinh^{-1}(x) - i\tan^{-1}(y) = \sinh^{-1}\left(\frac{(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x + \sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi} \right\rfloor} \left(i\sqrt{x^2+1} + x y\right)}{\sqrt{y^2+1}}\right) - \frac{1}{2} i \pi \left(2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x + \sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(\frac{i-y}{\sqrt{y^2+1}}\right)}{2\pi} \right\rfloor + \right.$$

$$\left. (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x + \sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi} \right\rfloor} - 2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x + \sqrt{x^2+1}\, y}{\sqrt{y^2+1}}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(\frac{i-y}{\sqrt{y^2+1}}\right)}{2\pi} \right\rfloor \right)$$

Involving $\cot^{-1}(z)$

01.25.16.0189.01

$$\sinh^{-1}(x) - \cot^{-1}(y) =$$

$$-2 i \pi \left(\left\lfloor \frac{-\arg\left(x + \sqrt{x^2+1}\right) - \arg\left(\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1 - \frac{i}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(x + \sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor\right) -$$

$$2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(1 + \frac{i}{y}\right)^{i/2}\right) - \arg\left(\left(x + \sqrt{x^2+1}\right)\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\left(x + \sqrt{x^2+1}\right)\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}\right)\right)}{2\pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\pi - \frac{1}{2}\operatorname{Re}\left(\log\left(1 + \frac{i}{y}\right)\right)}{2\pi} \right\rfloor \right) + \log\left(\left(x + \sqrt{x^2+1}\right)\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}} \left(1 + \frac{i}{y}\right)^{i/2}\right)$$

01.25.16.0190.01

$$\sinh^{-1}(x) - \cot^{-1}(y) =$$

$$-2 i \pi \left(\left\lfloor \frac{-\arg\left(x + \sqrt{x^2+1}\right) - \arg\left(\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1 - \frac{i}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(x + \sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor\right) -$$

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{i/2}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)}{2\pi}\right\rfloor\right)+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2\left(1-\frac{i}{y}\right)^{-i}\left(1+\frac{i}{y}\right)^{i}-1\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)\right)}{2\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)\right)}{2\pi}\right\rfloor+\left\lfloor-\mathrm{ar}\ldots\right.}$$

$$-$$

$$\left.(-1)^{\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\left(x+\sqrt{x^2+1}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)\right)}{2\pi}\right\rfloor+\left\lfloor-\mathrm{ar}\ldots\right.}\right)$$

01.25.16.0191.01

$$\sinh^{-1}(x) - i \cot^{-1}(y) = -\frac{\left(\sqrt{1+\frac{1}{y^2}}\, y\right)\sqrt{\frac{\left(i\, x\, y+\sqrt{x^2+1}\right)^2}{y^2+1}}}{i \sqrt{x^2+1} - x\, y} \sin^{-1}\left(\frac{\sqrt{x^2+1} - \frac{i\, x}{y}}{\sqrt{1+\frac{1}{y^2}}}\right) +$$

$$\frac{\pi \sqrt{\frac{\left(i\, x\, y+\sqrt{x^2+1}\right)^2}{y^2+1}}\, \sqrt{1+\frac{1}{y^2}}\, y}{2\, i \sqrt{x^2+1} - 2\, x\, y} + i\, \pi \left(1 - \frac{\sqrt{1+\frac{1}{y^2}}\, y \sqrt{\frac{\left(i\, x\, y+\sqrt{x^2+1}\right)^2}{y^2+1}}}{i\, x\, y + \sqrt{x^2+1}}\right) \left\lfloor \frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\frac{i+\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{2\, \pi} \right\rfloor -$$

$$i\, \pi \left(-\frac{\sqrt{1+\frac{1}{y^2}}\, \sqrt{\frac{\left(i\, x\, y+\sqrt{x^2+1}\right)^2}{y^2+1}}\, y}{i\, x\, y + \sqrt{x^2+1}} - 1\right) \left\lfloor -\frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\frac{i+\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right) - \pi}{2\, \pi} \right\rfloor$$

01.25.16.0192.01

$$\sinh^{-1}(x) - i\cot^{-1}(y) = \sinh^{-1}\left(\frac{(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i x - \frac{\sqrt{x^2+1}}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi} \right\rfloor} \left(-i\sqrt{x^2+1} - \frac{x}{y}\right)}{\sqrt{1+\frac{1}{y^2}}}\right) + \frac{1}{2} i \pi \left(2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i x - \frac{\sqrt{x^2+1}}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\frac{i+\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{2\pi} \right\rfloor + \right.$$

$$\left. (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i x - \frac{\sqrt{x^2+1}}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi} \right\rfloor} - 2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i x - \frac{\sqrt{x^2+1}}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\frac{i+\frac{1}{y}}{\sqrt{1+\frac{1}{y^2}}}\right)}{2\pi} \right\rfloor \right)$$

Involving $\csc^{-1}(z)$

01.25.16.0193.01

$$\sinh^{-1}(x) - \csc^{-1}(y) = \log\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{i}\right) -$$

$$2 i \pi \left(\left\lfloor \frac{-\arg\left(x+\sqrt{x^2+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{i}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right)}{2\pi} \right\rfloor\right)$$

01.25.16.0194.01

$$\sinh^{-1}(x)-\csc^{-1}(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{\pi}\right\rfloor \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{2i}-1\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}}{2\left(x+\sqrt{x^2+1}\right)}\right)-\frac{1}{2}i$$

$$(-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}\right\rfloor \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{\pi}\right\rfloor}\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}\right\rfloor+\left\lfloor \arg\left(x+\sqrt{x^2+1}\right.\cdots\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}-1\right)}{2\pi}\right\rfloor+\left\lfloor \arg\left(x+\sqrt{x^2+1}\right.\cdots\right.}$$

$$\left.\right)\pi-2i\pi\left(\left\lfloor\frac{-\arg\left(x+\sqrt{x^2+1}\right)-\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2\pi}\right\rfloor\right)$$

01.25.16.0195.01

$$\sinh^{-1}(x) - i\csc^{-1}(y) = \frac{\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}\right)^2}}\sinh^{-1}\!\left(x\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,\sqrt{x^2+1}}{y}\right) +$$

$$i\,\pi\left\lfloor\frac{\arg\!\left(x+\sqrt{x^2+1}\right)+\arg\!\left(\sqrt{1-\frac{1}{y^2}}-\frac{i}{y}\right)}{2\,\pi}\right\rfloor\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}\right)^2}}\right) +$$

$$\frac{1}{2}\,i\,\pi\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}\right)^2}}\right) -$$

$$i\,\pi\left(\frac{\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}} - \frac{i\,x}{y}\right)^2}}+1\right)\left\lfloor\frac{-\arg\!\left(x+\sqrt{x^2+1}\right)-\arg\!\left(\sqrt{1-\frac{1}{y^2}}-\frac{i}{y}\right)+\pi}{2\,\pi}\right\rfloor$$

01.25.16.0196.01

$$\sinh^{-1}(x) - i\csc^{-1}(y) = \sinh^{-1}\left((-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor} \left(x\sqrt{1-\frac{1}{y^2}} - \frac{i\sqrt{x^2+1}}{y}\right)\right) -$$

$$\frac{1}{2} i \pi \left(2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right\rfloor + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor} + \right.$$

$$\left. 2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\sqrt{1-\frac{1}{y^2}} - \frac{i x}{y}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(x+\sqrt{x^2+1}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right\rfloor - 1 \right)$$

Involving $\sec^{-1}(z)$

01.25.16.0197.01

$$\sinh^{-1}(x) - \sec^{-1}(y) = -2 i \pi$$

$$\left(\left\lfloor \frac{-\arg\left(x+\sqrt{x^2+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor\right) +$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) - \frac{\pi}{2}$$

01.25.16.0198.01

$$\sinh^{-1}(x) - \sec^{-1}(y) = -2 i \pi$$

$$\left(\left\lfloor \frac{-\arg\left(x+\sqrt{x^2+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor\right) +$$

$$(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{\left(\left(x+\sqrt{x^2+1}\right)^2\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-2i}-1\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}}{2\left(x+\sqrt{x^2+1}\right)}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\left(x+\cdots\right.\right.}{\cdots}\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)(-i)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\left(x+\cdots\right.\right.}{\cdots}\right.}$$

$$\left.\right)$$

$$\pi-\frac{\pi}{2}$$

01.25.16.0199.01

$$\sinh^{-1}(x) - i\sec^{-1}(y) = -\frac{\pi i}{2} + \frac{\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}} \sinh^{-1}\!\left(x\sqrt{1-\frac{1}{y^2}} + \frac{i\sqrt{x^2+1}}{y}\right) +$$

$$i\pi \left\lfloor \frac{\arg\!\left(x+\sqrt{x^2+1}\right) + \arg\!\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right\rfloor \left(1 - \frac{\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}}\right) +$$

$$\frac{1}{2} i\pi \left(1 - \frac{\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}}\right) +$$

$$i(-\pi) \left(\frac{\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}}{\sqrt{\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)^2}} + 1\right) \left\lfloor \frac{-\arg\!\left(x+\sqrt{x^2+1}\right) - \arg\!\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right) + \pi}{2\pi} \right\rfloor$$

01.25.16.0200.01

$$\sinh^{-1}(x) - i\sec^{-1}(y) = \sinh^{-1}\left((-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi} \right\rfloor} \left(x\sqrt{1-\frac{1}{y^2}} + \frac{i\sqrt{x^2+1}}{y}\right)\right) - \frac{1}{2}\pi i \left(2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(x + \sqrt{x^2+1}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right\rfloor + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi} \right\rfloor} + 2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x}{y} + \sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(x + \sqrt{x^2+1}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right\rfloor\right)$$

Involving $\cosh^{-1}(z)$

01.25.16.0038.01

$$\sinh^{-1}(x) - \cosh^{-1}(y) = \sinh^{-1}\left(x y - \sqrt{x^2+1}\,\sqrt{y^2-1}\right) /;\ y > 0$$

01.25.16.0039.01

$$\sinh^{-1}(x) - \cosh^{-1}(y) = -\sinh^{-1}\left(x y - \sqrt{x^2+1}\,\sqrt{y^2-1}\right) - \pi i /;\ -1 < y < 0$$

01.25.16.0040.01

$$\sinh^{-1}(x) - \cosh^{-1}(y) = -\sinh^{-1}\left(x y + \sqrt{y^2-1}\,\sqrt{x^2+1}\right) - \pi i /;\ y < -1$$

01.25.16.0201.01

$$\sinh^{-1}(x) - \cosh^{-1}(y) = \sinh^{-1}\left(i\,(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(-i\,x\,y + i\sqrt{x^2+1}\,\sqrt{y-1}\,\sqrt{y+1}\right)}{\pi} \right\rfloor} \left(x\sqrt{y-1}\,\sqrt{y+1} - \sqrt{x^2+1}\,y \right) \right) +$$

$$\frac{1}{2}\,i\,\pi \left(\frac{1}{2}\left(1 - (-1)^{-\left\lfloor -\frac{\arg(1-y)}{2\pi} \right\rfloor}\right) \left(2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2} - i\,x\,y\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(i\,y + \sqrt{1-y^2}\right)}{2\pi} \right\rfloor + \right.\right.$$

$$\left.(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2} - i\,x\,y\right)}{\pi} \right\rfloor} + 2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-y^2} - i\,x\,y\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(i\,y + \sqrt{1-y^2}\right)}{2\pi} \right\rfloor \right) -$$

$$\frac{1}{2}\left(1 + (-1)^{-\left\lfloor -\frac{\arg(1-y)}{2\pi} \right\rfloor}\right) \left(2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(i\,x\,y + \sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(x + \sqrt{x^2+1}\right) + \arg\left(i\,y + \sqrt{1-y^2}\right)}{2\pi} \right\rfloor + \right.$$

$$\left.\left.(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(i\,x\,y + \sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi} \right\rfloor} + 2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(i\,x\,y + \sqrt{x^2+1}\,\sqrt{1-y^2}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(x + \sqrt{x^2+1}\right) + \arg\left(i\,y + \sqrt{1-y^2}\right)}{2\pi} \right\rfloor \right)\right)$$

Involving $\tanh^{-1}(z)$

01.25.16.0202.01

$$\sinh^{-1}(x)-\tanh^{-1}(y)=\frac{\sqrt{\frac{\left(i\,x-i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{x-\sqrt{x^2+1}\;y}\sin^{-1}\left(\frac{\sqrt{x^2+1}-x\,y}{\sqrt{1-y^2}}\right)-$$

$$\frac{i\,\pi\sqrt{\frac{\left(i\,x-i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{2\left(i\,x-i\sqrt{x^2+1}\;y\right)}-i\,\pi\left(\frac{\sqrt{\frac{\left(i\,x-i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{i\,x-i\sqrt{x^2+1}\;y}+1\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+i\,y}{\sqrt{1-y^2}}\right)}{2\,\pi}\right\rfloor+$$

$$i\,\pi\left(\frac{\sqrt{\frac{\left(i\,x-i\sqrt{x^2+1}\;y\right)^2}{1-y^2}}\;\sqrt{1-y^2}}{i\,x-i\sqrt{x^2+1}\;y}-1\right)\left\lfloor-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+i\,y}{\sqrt{1-y^2}}\right)-\pi}{2\,\pi}\right\rfloor$$

01.25.16.0203.01

$$\sinh^{-1}(x)-\tanh^{-1}(y)=$$

$$\sinh^{-1}\left(\frac{i\,(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x-i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}\left(\sqrt{x^2+1}-x\,y\right)}{\sqrt{1-y^2}}\right)-\frac{1}{2}\,i\,\pi\left(2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x-i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+i\,y}{\sqrt{1-y^2}}\right)}{2\,\pi}\right\rfloor+\right.$$

$$\left.(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x-i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}-2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\frac{i\,x-i\sqrt{x^2+1}\;y}{\sqrt{1-y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+i\,y}{\sqrt{1-y^2}}\right)}{2\,\pi}\right\rfloor\right)$$

Involving $\coth^{-1}(z)$

01.25.16.0204.01

$$\sinh^{-1}(x) - \coth^{-1}(y) =$$
$$-\frac{\sqrt{1-\frac{1}{y^2}}\,\sqrt{-\frac{(y^2+1)x^2-2\sqrt{x^2+1}\,y\,x+1}{y^2-1}}\,y}{\sqrt{x^2+1}-x\,y}\sin^{-1}\left(\frac{\sqrt{x^2+1}-\frac{x}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)+\frac{\pi\sqrt{-\frac{(y^2+1)x^2-2\sqrt{x^2+1}\,y\,x+1}{y^2-1}}\,\sqrt{1-\frac{1}{y^2}}\,y}{2\left(\sqrt{x^2+1}-x\,y\right)}-$$
$$i\,\pi\left(\frac{i\sqrt{-\frac{(y^2+1)x^2-2\sqrt{x^2+1}\,y\,x+1}{y^2-1}}\,\sqrt{1-\frac{1}{y^2}}\,y}{\sqrt{x^2+1}-x\,y}+1\right)\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+\frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)}{2\,\pi}\right\rfloor-$$
$$i\,\pi\left(1-\frac{i\sqrt{1-\frac{1}{y^2}}\,y\sqrt{-\frac{(y^2+1)x^2-2\sqrt{x^2+1}\,y\,x+1}{y^2-1}}}{\sqrt{x^2+1}-x\,y}\right)\left\lfloor-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\frac{i+\frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}}\right)-\pi}{2\,\pi}\right\rfloor$$

01.25.16.0205.01

$$\sinh^{-1}(x) - \coth^{-1}(y) =$$

$$i \sin^{-1}\left(\frac{(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x - \frac{i \sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}} \right)}{\pi} \right\rfloor} \left(\sqrt{x^2+1} - \frac{x}{y} \right)}{\sqrt{1-\frac{1}{y^2}}} \right) - \frac{1}{2} i \pi \left(2 \left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x - \frac{i \sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}} \right)}{\pi} \right\rfloor} \right) \left\lfloor \frac{\arg\left(\sqrt{x^2+1} - x \right) + \arg\left(\frac{i + \frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}} \right)}{2 \pi} \right\rfloor + \right.$$

$$\left. (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x - \frac{i \sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}} \right)}{\pi} \right\rfloor} - 2 \left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i x - \frac{i \sqrt{x^2+1}}{y}}{\sqrt{1-\frac{1}{y^2}}} \right)}{\pi} \right\rfloor} \right) \left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1} - x \right) + \arg\left(\frac{i + \frac{i}{y}}{\sqrt{1-\frac{1}{y^2}}} \right)}{2 \pi} \right\rfloor \right)$$

Involving $\operatorname{csch}^{-1}(z)$

01.25.16.0206.01

$$\operatorname{csch}^{-1}(y)-\sinh^{-1}(x)=\frac{\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}\right)^2}}\sinh^{-1}\left(x\sqrt{1+\frac{1}{y^2}}-\frac{\sqrt{x^2+1}}{y}\right)-$$

$$i\,\pi\left\lfloor\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)}{2\,\pi}\right\rfloor\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}\right)^2}}\right)-$$

$$\frac{1}{2}\,i\,\pi\left(1-\frac{\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}\right)^2}}\right)+$$

$$i\,\pi\left(\frac{\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}}{\sqrt{\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}}-\frac{x}{y}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(\sqrt{x^2+1}-x\right)-\arg\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)+\pi}{2\,\pi}\right\rfloor$$

01.25.16.0207.01

$$\sinh^{-1}(x) - \operatorname{csch}^{-1}(y) = \sinh^{-1}\left((-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}} - \frac{x}{y}\right)}{\pi} \right\rfloor} \left(x\sqrt{1+\frac{1}{y^2}} - \frac{\sqrt{x^2+1}}{y}\right)\right) +$$

$$\frac{1}{2} i \pi \left(2\left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}} - \frac{x}{y}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(\sqrt{1+\frac{1}{y^2}} + \frac{1}{y}\right)}{2\pi} \right\rfloor + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}} - \frac{x}{y}\right)}{\pi} \right\rfloor} + \right.$$

$$\left. 2\left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1+\frac{1}{y^2}} - \frac{x}{y}\right)}{\pi} \right\rfloor}\right) \left\lfloor \frac{1}{2} - \frac{\arg\left(\sqrt{x^2+1} - x\right) + \arg\left(\sqrt{1+\frac{1}{y^2}} + \frac{1}{y}\right)}{2\pi} \right\rfloor - 1 \right)$$

Involving $\operatorname{sech}^{-1}(z)$

01.25.16.0208.01

$$\sinh^{-1}(x)-\operatorname{sech}^{-1}(y)=\sinh^{-1}\left(i\,(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(i\sqrt{x^2+1}\,\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}-\frac{i\,x}{y}\right)}{\pi}\right\rfloor}\left(x\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}-\frac{\sqrt{x^2+1}}{y}\right)\right)+$$

$$\frac{1}{2}\,i\,\pi\left(\frac{1}{2}\left(1-(-1)^{-\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}-\frac{i\,x}{y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+\right.\right.$$

$$\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}-\frac{i\,x}{y}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}-\frac{i\,x}{y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{x^2+1}-x\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor\right)-$$

$$\frac{1}{2}\left(1+(-1)^{-\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x}{y}+\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x}{y}+\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,x}{y}+\sqrt{x^2+1}\,\sqrt{1-\frac{1}{y^2}}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(x+\sqrt{x^2+1}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor\right)\right)$$

Linear combinations involving the direct function

Involving log(z)

01.25.16.0209.01

$$a\sinh^{-1}(x)+b\log(y)=\log\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)-$$

$$2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(y^b\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}(b\log(y))}{2\pi}\right\rfloor\right)$$

01.25.16.0210.01

$$a\sinh^{-1}(x) + b\log(y) =$$

$$(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(-i\, y^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a y^b - 1\right)}{2\pi} \right\rfloor} \sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a} y^{-b}\left(\left(x+\sqrt{x^2+1}\right)^{2a} y^{2b} - 1\right)\right) -$$

$$\frac{1}{2}\, i\, (-1)^{-\left\lfloor -\frac{\arg\left(-i\, y^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a y^b - 1\right)}{2\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{\pi} \right\rfloor} \left(1 - (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{\pi} \right\rfloor} + \right.$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b - i\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{2\pi} \right\rfloor + \left\lfloor -\frac{\arg\left(-i\, y^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a y^b - 1\right)}{2\pi} \right\rfloor + \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b - i\right)}{2\pi} + \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{2\pi} + \frac{1}{2} \right\rfloor + \left\lfloor - \frac{\arg(\cdots}{} \right.}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(y^b \left(x+\sqrt{x^2+1}\right)^a + i\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{2\pi} \right\rfloor + \left\lfloor -\frac{\arg\left(-i\, y^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a y^b - 1\right)}{2\pi} \right\rfloor + \left\lfloor -\frac{\arg\left(y^b \left(x+\sqrt{x^2+1}\right)^a + i\right)}{2\pi} + \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a y^b\right)}{2\pi} + \frac{1}{2} \right\rfloor + \left\lfloor - \frac{\arg(\cdots}{} \right.}$$

$$\left. \vphantom{\frac{1}{2}} \right) \pi - 2\, i\, \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(y^b\right) + \pi}{2\pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\pi - \operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}(b\log(y))}{2\pi} \right\rfloor \right)$$

Involving $\sin^{-1}(z)$

01.25.16.0211.01

$$a\sinh^{-1}(x) + b\sin^{-1}(y) =$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)^a \left(i\, y + \sqrt{1-y^2}\right)^{-i\, b}\right) - 2\, i\, \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(i\, y + \sqrt{1-y^2}\right)^{-i\, b}\right) + \pi}{2\pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\operatorname{Re}\left(b\log\left(i\, y + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor \right)$$

01.25.16.0212.01

$$a \sinh^{-1}(x)+b \sin^{-1}(y)=(-1)^{\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}\right)}{\pi} \rfloor - \lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{-i b} \left(x+\sqrt{x^2+1}\right)^a-1\right)}{2 \pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}-1\right)}{2 \pi} \rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(i y+\sqrt{1-y^2}\right)^{i b}\left(\left(x+\sqrt{x^2+1}\right)^{2 a}\left(i y+\sqrt{1-y^2}\right)^{-2 i b}-1\right)\right)-$$

$$\frac{1}{2} i (-1)^{-\lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{-i b} \left(x+\sqrt{x^2+1}\right)^a-1\right)}{2 \pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}-1\right)}{2 \pi} \rfloor - \lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}\right)}{\pi} \rfloor}$$

$$\left(1-(-1)^{\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}\right)}{\pi} \rfloor}+\right.$$

$$(-1)^{\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}-i\right)}{2 \pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}\right)}{2 \pi} \rfloor + \lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{-i b} \left(x+\sqrt{x^2+1}\right)^a-1\right)}{2 \pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}-1\right)}{2 \pi} \rfloor + \lfloor -}$$

$$-$$

$$(-1)^{\lfloor \frac{\arg\left(\left(i y+\sqrt{1-y^2}\right)^{-i b} \left(x+\sqrt{x^2+1}\right)^a+i\right)}{2 \pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}\right)}{2 \pi} \rfloor + \lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{-i b} \left(x+\sqrt{x^2+1}\right)^a-1\right)}{2 \pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{-i b}-1\right)}{2 \pi} \rfloor + \lfloor -}$$

$$\left.\right) \pi - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(i y+\sqrt{1-y^2}\right)^{-i b}\right)+\pi}{2 \pi} \right\rfloor + \right.$$

$$\left.\left\lfloor \frac{\operatorname{Re}\left(b \log\left(i y+\sqrt{1-y^2}\right)\right)+\pi}{2 \pi} \right\rfloor + \left\lfloor \frac{\pi-\operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2 \pi} \right\rfloor\right)\right)$$

Involving $\cos^{-1}(z)$

01.25.16.0213.01

$$a\sinh^{-1}(x)+b\cos^{-1}(y)=$$

$$\frac{\pi b}{2}-2i\pi\left(\left\lfloor\frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(i y+\sqrt{1-y^2}\right)^{i b}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Re}\left(b\log\left(i y+\sqrt{1-y^2}\right)\right)}{2\pi}\right\rfloor\right)+\log\left(\left(x+\sqrt{x^2+1}\right)^a\left(i y+\sqrt{1-y^2}\right)^{i b}\right)$$

01.25.16.0214.01

$$a \sinh^{-1}(x) + b \cos^{-1}(y) =$$

$$\frac{\pi b}{2} - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(i y+\sqrt{1-y^2}\right)^{i b}\right) + \pi}{2 \pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2 \pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\pi - \operatorname{Re}\left(b \log\left(i y+\sqrt{1-y^2}\right)\right)}{2 \pi} \right\rfloor \right) +$$

$$(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b}\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b} - 1\right)}{2 \pi} \right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2} \left(x+\sqrt{x^2+1}\right)^{-a} \left(i y+\sqrt{1-y^2}\right)^{-i b} \left(\left(x+\sqrt{x^2+1}\right)^{2 a} \left(i y+\sqrt{1-y^2}\right)^{2 i b} - 1\right)\right) -$$

$$\frac{1}{2} i (-1)^{-\left\lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b} - 1\right)}{2 \pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b}\right)}{\pi} \right\rfloor}$$

$$\left(1 - (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b}\right)}{\pi} \right\rfloor} + \right.$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b} - i\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b}\right)}{2 \pi} \right\rfloor + \left\lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b} - 1\right)}{2 \pi} \right\rfloor + \lfloor -\arg((x}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(i y+\sqrt{1-y^2}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a + i\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b}\right)}{2 \pi} \right\rfloor + \left\lfloor -\frac{\arg\left(-i \left(i y+\sqrt{1-y^2}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(i y+\sqrt{1-y^2}\right)^{i b} - 1\right)}{2 \pi} \right\rfloor + \lfloor -\arg((i}$$

$$\left. \right)$$

$$\pi$$

Involving $\tan^{-1}(z)$

01.25.16.0215.01

$$a\sinh^{-1}(x)+b\tan^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(b\log(i\,y+1))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left((1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(b\log(1-i\,y))}{2\,\pi}\right\rfloor\right)+\log\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}(i\,y+1)^{-\frac{1}{2}(i\,b)}\right)$$

01.25.16.0216.01

$$a\sinh^{-1}(x)+b\tan^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(b\log(i\,y+1))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left((1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(b\log(1-i\,y))}{2\,\pi}\right\rfloor\right)+$$

$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}(i\,y+1)^{-\frac{1}{2}(i\,b)}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}(i\,y+1)^{-\frac{1}{2}(i\,b)}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\left(x+\sqrt{x^2+1}\right)^a(-i)(1-i\,y)^{\frac{i\,b}{2}}-1\right)}{2\,\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(\left(x+\sqrt{x^2+1}\right)^{2\,a}(1-i\,y)^{i\,b}(i\,y+1)^{-i\,b}-1\right)(1-i\,y)^{-\frac{1}{2}(i\,b)}(i\,y+1)^{\frac{i\,b}{2}}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}(i\,y+1)^{-\frac{1}{2}(i\,b)}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\left(x+\sqrt{x^2+1}\right)^a(-i)(1-i\,y)^{\frac{i\,b}{2}}-1\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a(1-i\,y)^{\frac{i\,b}{2}}(i\,y+1)^{-\frac{1}{2}(i\,b)}\right)}{\pi}\right\rfloor}$$

$$\Bigg(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}} (i\,y+1)^{-\frac{1}{2}(i\,b)}\right)}{\pi}\right\rfloor}+$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}} (i\,y+1)^{-\frac{1}{2}(i\,b)}\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}} (i\,y+1)^{-\frac{1}{2}(i\,b)}-i\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}} (i\,y+1)^{-\frac{1}{2}(i\,b)}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\left(x+\sqrt{x^2+1}\right)^a}{2\pi}\right.}$$

$$-$$

$$(-1)^{\left\lfloor \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}} (i\,y+1)^{-\frac{1}{2}(i\,b)}\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}}+i\right)}{2\pi}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(\left(x+\sqrt{x^2+1}\right)^a (1-i\,y)^{\frac{i\,b}{2}} (i\,y+1)^{-\frac{1}{2}(i\,b)}-1\right)\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\left(x+\sqrt{x^2+1}\right)^a}{2\pi}\right.}$$

$$\Bigg)$$

$$\pi$$

Involving $\cot^{-1}(z)$

01.25.16.0217.01

$$a \sinh^{-1}(x) + b \cot^{-1}(y) = -2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right) - \arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2} \operatorname{Re}\left(b \log\left(1+\frac{i}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}\right)\right)}{2\pi} \right\rfloor \right) - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(1-\frac{i}{y}\right)^{\frac{i b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \frac{1}{2} \operatorname{Re}\left(b \log\left(1-\frac{i}{y}\right)\right)}{2\pi} \right\rfloor \right) + \log\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right)$$

01.25.16.0218.01

$$a \sinh^{-1}(x) + b \cot^{-1}(y) = -2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right) - \arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2} \operatorname{Re}\left(b \log\left(1+\frac{i}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}\right)\right)}{2\pi} \right\rfloor \right) - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(1-\frac{i}{y}\right)^{\frac{i b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \frac{1}{2} \operatorname{Re}\left(b \log\left(1-\frac{i}{y}\right)\right)}{2\pi} \right\rfloor \right) + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)} \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)} - 1\right)}{2\pi} \right\rfloor} \sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a} \left(\left(x+\sqrt{x^2+1}\right)^{2a} \left(1-\frac{i}{y}\right)^{i b} \left(1+\frac{i}{y}\right)^{-i b} - 1\right) \left(1-\frac{i}{y}\right)^{-\frac{1}{2}(i b)} \left(1+\frac{i}{y}\right)^{\frac{i b}{2}}\right) -$$

$$\frac{1}{2}\, i\, (-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)} \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)} \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \cdots\right.}{2\pi}}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)} \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i b)} \left(1-\frac{i}{y}\right)^{\frac{i b}{2}}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{i}{y}\right)^{\frac{i b}{2}} \cdots\right.}{2\pi}}$$

$$\left.\vphantom{\frac{1}{2}}\right) \Big/ \pi$$

Involving $\csc^{-1}(z)$

01.25.16.0219.01

$$a \sinh^{-1}(x) + b \csc^{-1}(y) =$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i b}\right) - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i b}\right)+\pi}{2\pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)+\pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor \right)$$

01.25.16.0220.01

$$a\sinh^{-1}(x)+b\csc^{-1}(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(\left(x+\sqrt{x^2+1}\right)^{2a}\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-2\,i\,b}-1\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i\,b}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}-1\right)}{2\pi}\right\rfloor}+$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\left(x+\sqrt{x^2+1}\right)^a+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}-1\right)}{2\pi}\right\rfloor}+$$

$$\left.\vphantom{\frac{1}{2}}\right)\pi-2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i\,b}\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor \frac{\operatorname{Re}\left(b\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor\right)$$

Involving $\sec^{-1}(z)$

01.25.16.0221.01

$$a \sinh^{-1}(x) + b \sec^{-1}(y) = \frac{\pi b}{2} - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right) + \pi}{2 \pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2 \pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2 \pi} \right\rfloor \right) + \log\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)$$

01.25.16.0222.01

$$a \sinh^{-1}(x) + b \sec^{-1}(y) = \frac{\pi b}{2} - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right) + \pi}{2 \pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2 \pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2 \pi} \right\rfloor \right) + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(-i \left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a - 1\right)\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(i \left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b} - 1\right)\right)}{2 \pi} \right\rfloor} \sinh^{-1}\left(\frac{1}{2} \left(x+\sqrt{x^2+1}\right)^{-a} \left(\left(x+\sqrt{x^2+1}\right)^{2 a} \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{2 i b} - 1\right) \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i b}\right) - \frac{1}{2} i (-1)^{-\left\lfloor -\frac{\arg\left(-i \left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b} \left(x+\sqrt{x^2+1}\right)^a - 1\right)\right)}{2 \pi} + \frac{1}{2} - \frac{\arg\left(i \left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b} - 1\right)\right)}{2 \pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)}{\pi} \right\rfloor} -$$

$$\Bigg(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)}{\pi}\right\rfloor}+$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg(\ldots}{\ldots}\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\left(x+\sqrt{x^2+1}\right)^a+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg(\ldots}{\ldots}\right.}$$

$$\Bigg)$$

$$\pi$$

Involving $\cosh^{-1}(z)$

01.25.16.0223.01

$$a\sinh^{-1}(x)+b\cosh^{-1}(y)=$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)\right)}{2\pi}\right\rfloor\right)$$

01.25.16.0224.01

$$a\sinh^{-1}(x)+b\cosh^{-1}(y)=(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^{-b}\left(\left(x+\sqrt{x^2+1}\right)^{2a}\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^{2b}-1\right)\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b-1\right)}{2\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b-i\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right.\right.}{2\pi}\right.}$$

$$-$$

$$(-1)^{\left\lfloor-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)}{2\pi}+\frac{\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\left(x+\sqrt{x^2+1}\right)^a+i\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b(-i)\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(y+\sqrt{y-1}\,\sqrt{y+1}\right.\right.}{2\pi}\right.}$$

$$\left.\right)\pi-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)\right)}{2\pi}\right\rfloor\right)$$

Involving $\tanh^{-1}(z)$

01.25.16.0225.01

$$a \sinh^{-1}(x) + b \tanh^{-1}(y) = -2\,i\,\pi \left(\left\lfloor \frac{-\arg\left(\left(x + \sqrt{x^2+1}\right)^a\right) - \arg\left((1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2} \operatorname{Im}(b \log(1-y)) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x + \sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor \right) - 2\,i\,\pi \left(\left\lfloor \frac{-\arg\left((y+1)^{b/2}\right) - \arg\left(\left(x + \sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \frac{1}{2} \operatorname{Im}(b \log(y+1))}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\left(x + \sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}}\right)\right)}{2\pi} \right\rfloor \right) + \log\left(\left(x + \sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)$$

01.25.16.0226.01

$$a \sinh^{-1}(x) + b \tanh^{-1}(y) = -2\,i\,\pi \left(\left\lfloor \frac{-\arg\left(\left(x + \sqrt{x^2+1}\right)^a\right) - \arg\left((1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2} \operatorname{Im}(b \log(1-y)) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x + \sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor \right) - 2\,i\,\pi \left(\left\lfloor \frac{-\arg\left((y+1)^{b/2}\right) - \arg\left(\left(x + \sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \frac{1}{2} \operatorname{Im}(b \log(y+1))}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\left(x + \sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}}\right)\right)}{2\pi} \right\rfloor \right) + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2} - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) (1-y)^{-\frac{b}{2}} (y+1)^{b/2} - 1\right)}{2\pi} \right\rfloor} \sinh^{-1}\left(\frac{1}{2} \left(x + \sqrt{x^2+1}\right)^{-a} (1-y)^{b/2} (y+1)^{-\frac{b}{2}} \left(\left(x + \sqrt{x^2+1}\right)^{2a} (1-y)^{-b} (y+1)^b - 1\right)\right) - \frac{1}{2}\, i\, (-1)^{-\left\lfloor -\frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2} - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) (1-y)^{-\frac{b}{2}} (y+1)^{b/2} - 1\right)}{2\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)}{\pi} \right\rfloor}$$

$$\Bigg(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)}{\pi}\right\rfloor}+$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}-i\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i)(1-y)^{-\frac{b}{2}} (y+1)^{b/2}-1\right)}{2\pi}\right\rfloor+\left\lfloor \cdots\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}+i\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a (1-y)^{-\frac{b}{2}} (y+1)^{b/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i)(1-y)^{-\frac{b}{2}} (y+1)^{b/2}-1\right)}{2\pi}\right\rfloor+\left\lfloor \cdots\right.}\Bigg)$$

$$\pi$$

Involving $\coth^{-1}(z)$

01.25.16.0227.01

$$a \sinh^{-1}(x) + b \coth^{-1}(y) =$$

$$-2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\frac{1}{2}\operatorname{Im}\left(b\log\left(1-\frac{1}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor\right)-$$

$$2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(1+\frac{1}{y}\right)^{b/2}\right)-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\frac{1}{2}\operatorname{Im}\left(b\log\left(1+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor \frac{\pi-\operatorname{Im}\left(\log\left(\left(x+\sqrt{x^2+1}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\right)\right)}{2\pi}\right\rfloor\right)+\log\left(\left(x+\sqrt{x^2+1}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\left(1+\frac{1}{y}\right)^{b/2}\right)$$

01.25.16.0228.01

$$a \sinh^{-1}(x) + b \coth^{-1}(y) =$$

$$-2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x + \sqrt{x^2+1}\right)^a\right) - \arg\left(\left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\frac{1}{2} \operatorname{Im}\left(b \log\left(1 - \frac{1}{y}\right)\right) + \pi}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x + \sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor \right) -$$

$$2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(1 + \frac{1}{y}\right)^{b/2}\right) - \arg\left(\left(x + \sqrt{x^2+1}\right)^a \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\pi - \frac{1}{2} \operatorname{Im}\left(b \log\left(1 + \frac{1}{y}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\left(x + \sqrt{x^2+1}\right)^a \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right)\right)}{2\pi} \right\rfloor \right) +$$

$$(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - 1\right)}{2\pi} \right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2} \left(x + \sqrt{x^2+1}\right)^{-a} \left(\left(x + \sqrt{x^2+1}\right)^{2a} \left(1 - \frac{1}{y}\right)^{-b} \left(1 + \frac{1}{y}\right)^{b} - 1 \right) \left(1 - \frac{1}{y}\right)^{b/2} \left(1 + \frac{1}{y}\right)^{-\frac{b}{2}} \right) -$$

$$\frac{1}{2} i (-1)^{-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - 1\right)}{2\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}\right)}{\pi} \right\rfloor}$$

$$\left(1 - (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}\right)}{\pi} \right\rfloor} + \right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - i\right)}{2\pi} + \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}\right)}{2\pi} + \frac{1}{2} \right\rfloor + \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i) \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i \left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2} - 1\right)}{2\pi} \right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a (-i)\left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a \left(1-\frac{1}{y}\right)^{-\frac{b}{2}} \left(1+\frac{1}{y}\right)^{b/2}-1\right.}{2\pi}}$$

$$\Bigg)$$

$$\pi$$

Involving $\operatorname{csch}^{-1}(z)$

01.25.16.0229.01

$$a \sinh^{-1}(x) + b \operatorname{csch}^{-1}(y) =$$

$$\log\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right) - 2 i \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)+\pi}{2\pi} \right\rfloor + \right.$$

$$\left. \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(b \log\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)\right)}{2\pi} \right\rfloor \right)$$

01.25.16.0230.01

$$a\sinh^{-1}(x)+b\operatorname{csch}^{-1}(y)=(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)}{\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b-1\right)}{2\pi}\right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(\left(x+\sqrt{x^2+1}\right)^{2a}\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^{2b}-1\right)\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^{-b}\right)-$$

$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b-1\right)}{2\pi}\right\rfloor-\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)}{\pi}\right\rfloor}$$

$$\left(1-(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)}{\pi}\right\rfloor}+\right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b-i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\left(x+\sqrt{\cdots}\right.\right.}{}\cdots\right.}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\left(x+\sqrt{x^2+1}\right)^a+i\right)}{2\pi}+\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor -\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\left(x+\sqrt{x^2+1}\right)^a-1\right)}{2\pi}+\frac{1}{2}-\frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b-1\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\arg\left(\left(\sqrt{1\cdots}\right.\right.}{}\cdots\right.}$$

$$\left.\vphantom{\int}\right)\pi-2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)^b\right)+\pi}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor \frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(b\log\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor\right)\right)$$

Involving $\operatorname{sech}^{-1}(z)$

01.25.16.0231.01

$$a \sinh^{-1}(x) + b \operatorname{sech}^{-1}(y) = \log\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right) - 2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right)-\arg\left(\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right)+\pi}{2\pi}\right\rfloor + \left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi}\right\rfloor + \left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor\right)$$

01.25.16.0232.01

$$a \sinh^{-1}(x) + b \operatorname{sech}^{-1}(y) =$$

$$(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right)}{\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(-i\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b - 1\right)}{2\pi} \right\rfloor}$$

$$\sinh^{-1}\left(\frac{1}{2}\left(x+\sqrt{x^2+1}\right)^{-a}\left(\left(x+\sqrt{x^2+1}\right)^{2a}\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^{2b} - 1\right)\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^{-b}\right) -$$

$$\frac{1}{2}\, i\, (-1)^{-\left\lfloor -\frac{\arg\left(-i\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b - 1\right)}{2\pi} \right\rfloor - \left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right)}{\pi} \right\rfloor}$$

$$\left(1 - (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right)}{\pi} \right\rfloor} + \right.$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b - i\right)}{2\pi} + \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right)}{2\pi} + \frac{1}{2} \right\rfloor + \left\lfloor -\frac{\arg\left(-i\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1} \cdots\right.\right.}{2\pi}\cdots}$$

$$-$$

$$(-1)^{\left\lfloor -\frac{\arg\left(\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b \left(x+\sqrt{x^2+1}\right)^a + i\right)}{2\pi} + \frac{\arg\left(\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right)}{2\pi} + \frac{1}{2} \right\rfloor + \left\lfloor -\frac{\arg\left(-i\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b \left(x+\sqrt{x^2+1}\right)^a - 1\right)}{2\pi} + \frac{1}{2} - \frac{\arg\left(i\left(x+\sqrt{x^2+1}\right)^a \left(\sqrt{\frac{1}{y}-1} \cdots\right.\right.}{2\pi}\cdots}$$

$$\left.\vphantom{\frac{1}{1}}\right)\left(\pi - 2\, i\, \pi \left(\left\lfloor \frac{-\arg\left(\left(x+\sqrt{x^2+1}\right)^a\right) - \arg\left(\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)^b\right) + \pi}{2\pi} \right\rfloor + \right.\right.$$

$$\left.\left.\left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(x+\sqrt{x^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(b \log\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)\right)}{2\pi} \right\rfloor \right)\right)$$

Identities

Functional identities

01.25.17.0001.01

$$\sinh^4(w(z_1)+w(z_2)) - 2\left(2 z_2^2 z_1^2 + z_1^2 + z_2^2\right)\sinh^2(w(z_1)+w(z_2)) + \left(z_1^2 - z_2^2\right)^2 = 0 \;/;\; w(z) = \sinh^{-1}(z)$$

Complex characteristics

Real part

01.25.19.0001.01

$$\operatorname{Re}\left(\sinh^{-1}(x + i y)\right) = \frac{1}{2}\log\left(X^2 + Y^2\right) \;/;\; X = x + \sqrt{\frac{1}{2}\left(x^2 - y^2 + \sqrt{\left(x^2+y^2+1\right)^2 - 4y^2} + 1\right)} \bigwedge Y = y + \sqrt{\frac{1}{2}\left(-x^2 + y^2 + \sqrt{\left(x^2+y^2+1\right)^2 - 4y^2} - 1\right)}\operatorname{sgn}(x y) \bigwedge i(x + i y) \notin (-\infty, -1) \bigwedge i(x + i y) \notin (1, \infty)$$

01.25.19.0002.01

$$\operatorname{Re}\left(\sinh^{-1}(x + i y)\right) = \log\left(\sqrt{\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2 - y^2 + 1, 2 x y\right)\right)\sqrt[4]{x^4 + 2\left(y^2+1\right)x^2 + \left(y^2-1\right)^2} + x\right)^2 + \left(\sin\left(\frac{1}{2}\tan^{-1}\left(x^2 - y^2 + 1, 2 x y\right)\right)\sqrt[4]{x^4 + 2\left(y^2+1\right)x^2 + \left(y^2-1\right)^2} + y\right)^2}\right)$$

Imaginary part

01.25.19.0003.01

$$\operatorname{Im}\left(\sinh^{-1}(x + i y)\right) = \operatorname{sgn}(Y)\cot^{-1}\left(\frac{X}{|Y|}\right) \;/;\; X = x + \sqrt{\frac{1}{2}\left(x^2 - y^2 + \sqrt{\left(x^2+y^2+1\right)^2 - 4y^2} + 1\right)} \bigwedge Y = y + \sqrt{\frac{1}{2}\left(-x^2 + y^2 + \sqrt{\left(x^2+y^2+1\right)^2 - 4y^2} - 1\right)}\operatorname{sgn}(x y) \bigwedge i(x + i y) \notin (-\infty, -1) \bigwedge i(x + i y) \notin (1, \infty)$$

01.25.19.0004.01

$$\operatorname{Im}\left(\sinh^{-1}(x + i y)\right) = \tan^{-1}\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2 - y^2 + 1, 2 x y\right)\right)\sqrt[4]{x^4 + 2\left(y^2+1\right)x^2 + \left(y^2-1\right)^2} + x, \sin\left(\frac{1}{2}\tan^{-1}\left(x^2 - y^2 + 1, 2 x y\right)\right)\sqrt[4]{x^4 + 2\left(y^2+1\right)x^2 + \left(y^2-1\right)^2} + y\right)$$

Absolute value

01.25.19.0005.01

$$\left|\sinh^{-1}(x+i\,y)\right| = \sqrt{\left(\tan^{-1}\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x,\;\sin\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)^2+\log^2\left(\sqrt{\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x\right)^2+\left(\sin\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)^2}\right)\right)}$$

Argument

01.25.19.0006.01

$$\arg\left(\sinh^{-1}(x+i\,y)\right) = \tan^{-1}\left(\log\left(\sqrt{\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{x^4+2\left(y^2+1\right)x^2+\left(y^2-1\right)^2}+x\right)^2+\left(\sin\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{x^4+2\left(y^2+1\right)x^2+\left(y^2-1\right)^2}+y\right)^2}\right),\;\tan^{-1}\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{x^4+2\left(y^2+1\right)x^2+\left(y^2-1\right)^2}+x,\;\sin\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{x^4+2\left(y^2+1\right)x^2+\left(y^2-1\right)^2}+y\right)\right)$$

Conjugate value

01.25.19.0007.01

$$\overline{\sinh^{-1}(x+i\,y)} = \log\left(\sqrt{\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x\right)^2+\left(\sin\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)^2}\right)-i\tan^{-1}\left(\cos\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x,\;\sin\left(\frac{1}{2}\tan^{-1}\left(x^2-y^2+1,\,2\,x\,y\right)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)$$

Signum value

01.25.19.0008.01

$$\operatorname{sgn}(\sinh^{-1}(x+i\,y)) = \left(i\tan^{-1}\left(\cos\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x,\right.\right.$$
$$\left.\sin\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)+$$
$$\log\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x\right)^2+\right.}\right.$$
$$\left.\left.\left.\left(\sin\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)^2\right)\right)\right)\Big/$$
$$\left(\sqrt{\left(\tan^{-1}\left(\cos\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x,\right.\right.}\right.$$
$$\left.\sin\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)^2+$$
$$\log^2\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+x\right)^2+\right.}\right.$$
$$\left.\left.\left.\left.\left(\sin\left(\frac{1}{2}\tan^{-1}(x^2-y^2+1,\,2\,x\,y)\right)\sqrt[4]{4\,x^2\,y^2+\left(x^2-y^2+1\right)^2}+y\right)^2\right)\right)\right)\right)$$

Differentiation

Low-order differentiation

01.25.20.0001.01

$$\frac{\partial \sinh^{-1}(z)}{\partial z} = \frac{1}{\sqrt{1+z^2}}$$

01.25.20.0002.01

$$\frac{\partial^2 \sinh^{-1}(z)}{\partial z^2} = -\frac{z}{\left(z^2+1\right)^{3/2}}$$

Symbolic differentiation

01.25.20.0005.01

$$\frac{\partial^n \sinh^{-1}(z)}{\partial z^n} = \sinh^{-1}(z)\,\delta_n + \frac{1}{(z^2+1)^{n-\frac{1}{2}}} \sum_{k=0}^{n-1} \frac{(1-n)_k \left(\frac{1}{2}\right)_k 2^{2k-n+1} z^{2k-n+1} (z^2+1)^{-k+n-1}}{(2k-n+1)!} \;/;\; n \in \mathbb{N}$$

01.25.20.0003.02

$$\frac{\partial^n \sinh^{-1}(z)}{\partial z^n} = 2^{n-1} \sqrt{\pi}\, z^{1-n}\, {}_3\tilde{F}_2\left(\frac{1}{2}, \frac{1}{2}, 1; 1-\frac{n}{2}, \frac{3-n}{2}; -z^2\right) /;\; n \in \mathbb{N}$$

01.25.20.0006.01

$$\frac{\partial^n \sinh^{-1}(z)}{\partial z^n} = \frac{(-1)^{n-1} (n-1)!}{(z^2+1)^{n/2}} P_{n-1}\left(\frac{z}{\sqrt{z^2+1}}\right) /;\; n \in \mathbb{N}^+$$

Brychkov Yu.A. (2006)

01.25.20.0007.01

$$\frac{\partial^n \sin^{-1}(z)}{\partial z^n} = (-i)^{n-1}\, 2^{1-n} (z^2+1)^{\frac{1}{2}-n} (n-1)!\, C_{n-1}^{1-n}(i z) \;/;\; n \in \mathbb{Z} \land n \geq 2$$

Brychkov Yu.A. (2006)

Fractional integro-differentiation

01.25.20.0004.01

$$\frac{\partial^\alpha \sinh^{-1}(z)}{\partial z^\alpha} = 2^{\alpha-1} \sqrt{\pi}\, z^{1-\alpha}\, {}_3\tilde{F}_2\left(\frac{1}{2}, \frac{1}{2}, 1; 1-\frac{\alpha}{2}, \frac{3}{2}-\frac{\alpha}{2}; -z^2\right)$$

Integration

Indefinite integration

For the direct function itself

01.25.21.0001.01

$$\int \sinh^{-1}(z)\, dz = z \sinh^{-1}(z) - \sqrt{z^2+1}$$

01.25.21.0002.01

$$\int \frac{\sinh^{-1}(z)}{z}\, dz = \frac{1}{2}\left(\sinh^{-1}(z)\left(\sinh^{-1}(z) + 2\log\left(1-e^{-2\sinh^{-1}(z)}\right)\right) - \text{Li}_2\left(e^{-2\sinh^{-1}(z)}\right)\right)$$

01.25.21.0003.01

$$\int \frac{\sinh^{-1}(z)}{\sqrt{z}}\, dz = 2\sqrt{z}\, \sinh^{-1}(z) + 4(-1)^{3/4} E\left(i \sinh^{-1}\left(\sqrt[4]{-1}\, \sqrt{z}\right) \middle| -1\right) - 4(-1)^{3/4} F\left(i \sinh^{-1}\left(\sqrt[4]{-1}\, \sqrt{z}\right) \middle| -1\right)$$

01.25.21.0004.01

$$\int z^{\alpha-1} \sinh^{-1}(z)\, dz = \frac{z^\alpha \sinh^{-1}(z)}{\alpha} - \frac{z^{\alpha+1}}{\alpha(\alpha+1)}\, {}_2F_1\left(\frac{\alpha+1}{2}, \frac{1}{2}; \frac{\alpha+3}{2}; -z^2\right)$$

01.25.21.0005.01

$$\int \sinh^{-1}(b+a\,z)\,dz = \frac{b\sinh^{-1}(b+a\,z)}{a} + z\sinh^{-1}(b+a\,z) - \frac{\sqrt{(b+a\,z)^2+1}}{a}$$

01.25.21.0006.01

$$\int z\sinh^{-1}(b+a\,z)\,dz = \frac{\sqrt{(b+a\,z)^2+1}\;(3\,b-a\,z) + \left(-2\,b^2+2\,a^2\,z^2+1\right)\sinh^{-1}(b+a\,z)}{4\,a^2}$$

01.25.21.0007.01

$$\int \frac{\sinh^{-1}(a\,z+b)}{z}\,dz = \sinh^{-1}(b+a\,z)\log(a\,z) - \frac{1}{8}\,i\Bigg(i\left(\pi-2\,i\sinh^{-1}(b+a\,z)\right)^2 +$$
$$4\log(a\,z)\left(\pi-2\,i\sinh^{-1}(b+a\,z)\right) + 32\,i\sin^{-1}\!\left(\frac{\sqrt{1-i\,b}}{\sqrt{2}}\right)\tan^{-1}\!\left(\frac{b-i}{\sqrt{b^2+1}}\tan\!\left(\frac{1}{4}\left(\pi-2\,i\sinh^{-1}(b+a\,z)\right)\right)\right) -$$
$$4\left(4\sin^{-1}\!\left(\frac{\sqrt{1-i\,b}}{\sqrt{2}}\right) - 2\,i\sinh^{-1}(b+a\,z)+\pi\right)\log\!\left(e^{\sinh^{-1}(b+a\,z)}\,b+\sqrt{b^2+1}\;e^{\sinh^{-1}(b+a\,z)}+1\right) -$$
$$4\left(-4\sin^{-1}\!\left(\frac{\sqrt{1-i\,b}}{\sqrt{2}}\right) - 2\,i\sinh^{-1}(b+a\,z)+\pi\right)\log\!\left(e^{\sinh^{-1}(b+a\,z)}\,b-\sqrt{b^2+1}\;e^{\sinh^{-1}(b+a\,z)}+1\right) +$$
$$8\,i\left(\mathrm{Li}_2\!\left(\left(\sqrt{b^2+1}-b\right)e^{\sinh^{-1}(b+a\,z)}\right) + \mathrm{Li}_2\!\left(-\left(b+\sqrt{b^2+1}\right)e^{\sinh^{-1}(b+a\,z)}\right)\right)\Bigg)$$

01.25.21.0008.01

$$\int \frac{1}{\sinh^{-1}(z)}\,dz = \mathrm{Chi}\!\left(\sinh^{-1}(z)\right)$$

01.25.21.0009.01

$$\int \sinh^{-1}(z)^n\,dz = \frac{1}{2}\left(\left(-\sinh^{-1}(z)\right)^{-n}\sinh^{-1}(z)^n\,\Gamma\!\left(n+1,-\sinh^{-1}(z)\right) - \Gamma\!\left(n+1,\sinh^{-1}(z)\right)\right)$$

01.25.21.0010.01

$$\int z\sinh^{-1}(z)^n\,dz = 2^{-n-3}\left(-\sinh^{-1}(z)\right)^{-n}\left(\Gamma\!\left(n+1,2\sinh^{-1}(z)\right)\left(-\sinh^{-1}(z)\right)^n + \sinh^{-1}(z)^n\,\Gamma\!\left(n+1,-2\sinh^{-1}(z)\right)\right)$$

Definite integration

For the direct function itself

01.25.21.0011.01

$$\int_0^1 t\sinh^{-1}(t)\,dt = \frac{1}{4}\left(3\sinh^{-1}(1)-\sqrt{2}\right)$$

01.25.21.0012.01

$$\int_0^1 \frac{\sinh^{-1}(t)}{t}\,dt = \frac{1}{12}\left(\log(4096)\log\!\left(1+\sqrt{2}\right)+\pi^2-6\left(\log^2\!\left(1+\sqrt{2}\right)+\mathrm{Li}_2\!\left(\frac{1}{3+2\sqrt{2}}\right)\right)\right)$$

01.25.21.0013.01

$$\int_0^1 t^a \sinh^{-1}(t)\,dt = \frac{1}{2a+2}\left(e^{-\frac{1}{2} i a \pi}\, \mathrm{B}_{-1}\left(\frac{a}{2}+1, \frac{1}{2}\right) + 2\log\left(1+\sqrt{2}\right)\right) /; \operatorname{Re}(a) > -2$$

Involving the direct function

01.25.21.0014.01

$$\int_0^1 \log(t) \sinh^{-1}(t)\,dt = -2\sinh^{-1}(1) + \log(2) + 2\sqrt{2} - 2$$

Representations through more general functions

Through hypergeometric functions

Involving $_2F_1$

01.25.26.0001.01

$$\sinh^{-1}(z) = z\,{}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; -z^2\right)$$

01.25.26.0002.01

$$\sinh^{-1}(z) = \frac{i\pi}{2} - \sqrt{2}\, i \sqrt{i(z-i)}\; {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; \frac{1}{2} i (z-i)\right)$$

01.25.26.0003.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \sqrt{2i}\,\sqrt{-i(z+i)}\; {}_2F_1\left(\frac{1}{2}, \frac{1}{2}; \frac{3}{2}; -\frac{i}{2}(z+i)\right)$$

Involving $_pF_q$

01.25.26.0004.01

$$\sinh^{-1}(z) = \frac{z}{2\sqrt{z^2}}\left(\log\left(4z^2\right) + \frac{1}{2z^2}\, {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -\frac{1}{z^2}\right)\right) /; i z \notin (-1, 1)$$

01.25.26.0005.01

$$\sinh^{-1}(z)^2 = z^2\, {}_3F_2\left(1, 1, 1; \frac{3}{2}, 2; -z^2\right)$$

Through Meijer G

Classical cases for the direct function itself

01.25.26.0006.01

$$\sinh^{-1}(z) = \frac{1}{2z\sqrt{\pi}}\, G_{2,2}^{1,2}\left(z^2 \,\middle|\, \begin{matrix} \frac{3}{2}, \frac{3}{2} \\ 1, \frac{1}{2} \end{matrix}\right)$$

01.25.26.0007.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}}{2z\sqrt{\pi}}\, G_{2,2}^{1,2}\left(z^2 \,\middle|\, \begin{matrix} 1, 1 \\ \frac{1}{2}, 0 \end{matrix}\right)$$

01.25.26.0008.01

$$\sinh^{-1}(z) = \frac{1}{2\sqrt{\pi}}\, G_{2,2}^{1,2}\left(z^2 \,\middle|\, \begin{matrix} 1, 1 \\ \frac{1}{2}, 0 \end{matrix}\right) /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.25.26.0009.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \frac{1}{2\sqrt{\pi}} G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} 1, 1 \\ \frac{1}{2}, 0 \end{matrix}\right)$$

01.25.26.0028.01

$$\sinh^{-1}\left(\sqrt{z}\right) - \sum_{k=0}^{n} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{k+\frac{1}{2}}}{(2k+1)\,k!} = \frac{(-1)^{n-1}}{2\sqrt{\pi}}$$

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} 1, 1, n+\frac{3}{2} \\ n+\frac{3}{2}, 0, \frac{1}{2} \end{matrix}\right) /; n \in \mathbb{N}$$

01.25.26.0029.01

$$\sinh^{-1}\left(\sqrt{z}\right) - \frac{1}{2}\log(4z) + \frac{1}{2}\sum_{k=1}^{n} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{-k}}{k\,k!} = \frac{(-1)^n}{2\sqrt{\pi}} G_{3,3}^{1,3}\left(\frac{1}{z} \,\middle|\, \begin{matrix} \frac{1}{2}, 1, n+1 \\ n+1, 0, 0 \end{matrix}\right) /; n \in \mathbb{N}$$

Classical cases involving algebraic functions

01.25.26.0010.01

$$\frac{\sinh^{-1}\left(\sqrt{z}\right)}{\sqrt{z+1}} = \frac{\sqrt{\pi}}{2} G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} \frac{1}{2}, \frac{1}{2} \\ \frac{1}{2}, 0 \end{matrix}\right)$$

01.25.26.0011.01

$$\frac{1}{\sqrt{z+1}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{\pi}}{2} G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} 0, \frac{1}{2} \\ 0, 0 \end{matrix}\right) /; z \notin (-1, 0)$$

Classical cases for powers of $\sinh^{-1}$

01.25.26.0012.01

$$\sinh^{-1}\left(\sqrt{z}\right)^2 = \frac{\sqrt{\pi}}{2} G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} 1, 1, 1 \\ 1, 0, \frac{1}{2} \end{matrix}\right)$$

Generalized cases for the direct function itself

01.25.26.0013.01

$$\sinh^{-1}(z) = \frac{1}{2z\sqrt{\pi}} G_{2,2}^{1,2}\left(\sqrt{z^2}, \frac{1}{2} \,\middle|\, \begin{matrix} \frac{3}{2}, \frac{3}{2} \\ 1, \frac{1}{2} \end{matrix}\right)$$

01.25.26.0014.01

$$\sinh^{-1}(z) = \frac{1}{2\sqrt{\pi}} G_{2,2}^{1,2}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} 1, 1 \\ \frac{1}{2}, 0 \end{matrix}\right)$$

01.25.26.0030.01

$$\sinh^{-1}(z) - \sum_{k=0}^{n} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{2k+1}}{(2k+1)\,k!} = \frac{(-1)^{n-1}}{2\sqrt{\pi}} G_{3,3}^{1,3}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} 1, 1, n+\frac{3}{2} \\ n+\frac{3}{2}, 0, \frac{1}{2} \end{matrix}\right) /; n \in \mathbb{N}$$

01.25.26.0031.01

$$\sinh^{-1}(z)-\frac{z\log\left(4z^2\right)}{2\sqrt{z^2}}+\frac{z}{2\sqrt{z^2}}\sum_{k=1}^{n}\frac{(-1)^k\left(\frac{1}{2}\right)_k z^{-2k}}{k\,k!}=\frac{(-1)^n z}{2\sqrt{\pi}\sqrt{z^2}}G_{3,3}^{1,3}\left(\frac{1}{z},\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{2},1,n+1\\ n+1,0,0\end{matrix}\right)/;n\in\mathbb{N}$$

Generalized cases involving algebraic functions

01.25.26.0015.01

$$\frac{\sinh^{-1}(z)}{\sqrt{z^2+1}}=\frac{\sqrt{\pi}}{2}G_{2,2}^{1,2}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{2},\frac{1}{2}\\ \frac{1}{2},0\end{matrix}\right)$$

01.25.26.0016.01

$$\frac{1}{\sqrt{1+\frac{1}{z^2}}}\sinh^{-1}\left(\frac{1}{z}\right)=\frac{\sqrt{\pi}}{2}G_{2,2}^{2,1}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{2},1\\ \frac{1}{2},\frac{1}{2}\end{matrix}\right)$$

01.25.26.0017.01

$$\frac{\sinh^{-1}\left(\frac{1}{z}\right)}{\sqrt{z^2+1}}=\frac{1}{2}\sqrt{\pi}\,G_{2,2}^{2,1}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}0,\frac{1}{2}\\ 0,0\end{matrix}\right)/;-\frac{\pi}{2}<\arg(z)\leq\frac{\pi}{2}$$

Classical cases for powers of $\sinh^{-1}$

01.25.26.0018.01

$$\sinh^{-1}(z)^2=\frac{1}{2}\sqrt{\pi}\,G_{3,3}^{1,3}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}1,1,1\\ 1,0,\frac{1}{2}\end{matrix}\right)$$

Through other functions

Involving inverse Jacobi functions

01.25.26.0019.01

$$\sinh^{-1}(z)=\operatorname{cs}^{-1}\left(\frac{1}{z}\,\middle|\,1\right)$$

01.25.26.0020.01

$$\sinh^{-1}(z)=i\operatorname{ds}^{-1}\left(\frac{i}{z}\,\middle|\,0\right)$$

01.25.26.0021.01

$$\sinh^{-1}(z)=\operatorname{ds}^{-1}\left(\frac{1}{z}\,\middle|\,1\right)$$

01.25.26.0022.01

$$\sinh^{-1}(z)=i\operatorname{ns}^{-1}\left(\frac{i}{z}\,\middle|\,0\right)$$

01.25.26.0023.01

$$\sinh^{-1}(z)=\operatorname{sc}^{-1}(z\mid 1)$$

01.25.26.0024.01

$$\sinh^{-1}(z)=\operatorname{sd}^{-1}(z\mid 1)$$

01.25.26.0025.01

$$\sinh^{-1}(z) = -i\,\mathrm{sd}^{-1}(i\,z \mid 0)$$

01.25.26.0026.01

$$\sinh^{-1}(z) = -i\,\mathrm{sn}^{-1}(i\,z \mid 0)$$

Involving some hypergeometric-type functions

01.25.26.0027.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{2\,z}\,\mathrm{B}_{-z^2}\left(\frac{1}{2}, \frac{1}{2}\right)$$

Representations through equivalent functions

With inverse function

Involving $\sinh^{-1}(\sinh(z))$

01.25.27.0001.01

$$\sinh^{-1}(\sinh(z)) = z \,/;\, -\frac{\pi}{2} < \mathrm{Im}(z) < \frac{\pi}{2} \bigvee \left(\mathrm{Im}(z) = -\frac{\pi}{2} \bigwedge \mathrm{Re}(z) \leq 0\right) \bigvee \left(\mathrm{Im}(z) = \frac{\pi}{2} \bigwedge \mathrm{Re}(z) \geq 0\right)$$

01.25.27.0002.01

$$\sinh^{-1}(\sinh(z)) = -\pi\,i - z \,/;\, -\frac{3\,\pi}{2} < \mathrm{Im}(z) < -\frac{\pi}{2} \bigvee \left(\mathrm{Im}(z) = -\frac{3\,\pi}{2} \bigwedge \mathrm{Re}(z) \leq 0\right) \bigvee \left(\mathrm{Im}(z) = -\frac{\pi}{2} \bigwedge \mathrm{Re}(z) \geq 0\right)$$

01.25.27.0003.01

$$\sinh^{-1}(\sinh(z)) = \pi\,i - z \,/;\, \frac{\pi}{2} < \mathrm{Im}(z) < \frac{3\,\pi}{2} \bigvee \left(\mathrm{Im}(z) = \frac{\pi}{2} \bigwedge \mathrm{Re}(z) \leq 0\right) \bigvee \left(\mathrm{Im}(z) = \frac{3\,\pi}{2} \bigwedge \mathrm{Re}(z) \geq 0\right)$$

01.25.27.0004.01

$$\sinh^{-1}(\sinh(z)) = (-1)^k\,(z - \pi\,i\,k) \,/;$$
$$\left(k\,\pi - \frac{\pi}{2} < \mathrm{Im}(z) < \pi\,k + \frac{\pi}{2} \bigvee \left(\mathrm{Im}(z) = k\,\pi - \frac{\pi}{2} \bigwedge \mathrm{Re}(z) \leq 0\right) \bigvee \left(\mathrm{Im}(z) = \pi\,k + \frac{\pi}{2} \bigwedge \mathrm{Re}(z) \geq 0\right)\right) \bigwedge k \in \mathbb{Z}$$

01.25.27.0005.02

$$\sinh^{-1}(\sinh(z)) =$$
$$(-1)^{\left\lfloor -\frac{\mathrm{Im}(z)}{\pi} - \frac{1}{2} \right\rfloor} \left(\left(1 + (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} - \frac{1}{2} \right\rfloor + \left\lfloor \frac{1}{2} - \frac{\mathrm{Im}(z)}{\pi} \right\rfloor}\right) \theta(-\mathrm{Re}(z)) - 1\right) \left(z + i\,\pi \left\lfloor \frac{1}{2} - \frac{\mathrm{Im}(z)}{\pi} \right\rfloor - \frac{1}{2}\,(\pi\,i) \left(1 + (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} - \frac{1}{2} \right\rfloor + \left\lfloor \frac{1}{2} - \frac{\mathrm{Im}(z)}{\pi} \right\rfloor}\right) \theta(-\mathrm{Re}(z))\right)$$

01.25.27.2017.01

$$\sinh^{-1}(\sinh(z)) = \begin{cases} (-1)^{\left\lfloor \frac{2\,\mathrm{Im}(z)+\pi}{2\,\pi} \right\rfloor} \left(\pi\,i \left\lfloor \frac{2\,\mathrm{Im}(z)-\pi}{2\,\pi} \right\rfloor - z\right) & \frac{2\,\mathrm{Im}(z)+\pi}{2\,\pi} \in \mathbb{Z} \bigwedge \mathrm{Re}(z) \geq 0 \\ (-1)^{\left\lfloor \frac{2\,\mathrm{Im}(z)+\pi}{2\,\pi} \right\rfloor} \left(z - \pi\,i \left\lfloor \frac{2\,\mathrm{Im}(z)+\pi}{2\,\pi} \right\rfloor\right) & \mathrm{True} \end{cases}$$

Involving $\sinh\left(\sinh^{-1}(z)\right)$

01.25.27.0006.01

$$\sinh\left(\sinh^{-1}(z)\right) = z$$

With related functions

Involving log

01.25.27.0007.01

$$\sinh^{-1}(z) = \log\left(z + \sqrt{z^2 + 1}\right)$$

01.25.27.0008.01

$$\sinh^{-1}(z) = \log\left(z + \sqrt{1 + i z} \sqrt{1 - i z}\right)$$

Involving $\sin^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}(i z)$

01.25.27.0009.01

$$\sinh^{-1}(z) = -i \sin^{-1}(i z)$$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}(1 + 2 z^2)$

01.25.27.0073.01

$$\sinh^{-1}(z) = \frac{i}{2}\left(\frac{\pi}{2} - \sin^{-1}(2 z^2 + 1)\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0074.01

$$\sinh^{-1}(z) = \frac{i}{2}\left(\sin^{-1}(2 z^2 + 1) - \frac{\pi}{2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0075.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{2 z}\left(\sin^{-1}(2 z^2 + 1) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{1 -+ z}}{\sqrt{2}}\right)$

01.25.27.0076.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \sin^{-1}\left(\frac{\sqrt{1 + i z}}{\sqrt{2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{2}}\right)$

01.25.27.0077.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \sin^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}\left(\sqrt{-z^2}\right)$

01.25.27.0078.01

$$\sinh^{-1}(z) = i \sin^{-1}\left(\sqrt{-z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0079.01

$$\sinh^{-1}(z) = -i \sin^{-1}\left(\sqrt{-z^2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0080.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{z} \sin^{-1}\left(\sqrt{-z^2}\right)$$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}\left(\sqrt{1+z^2}\right)$

01.25.27.0081.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \sin^{-1}\left(\sqrt{z^2+1}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0082.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \sin^{-1}\left(\sqrt{z^2+1}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0083.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\sin^{-1}\left(\sqrt{z^2+1}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\sin^{-1}\left(2 z \sqrt{-z^2-1}\right)$

01.25.27.0011.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^4}}{2 z^2} \sin^{-1}\left(2 z \sqrt{-z^2-1}\right) /; |\arg(z)| \leq \frac{\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{3\pi}{4}$$

01.25.27.0084.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i \sqrt{\frac{i}{z}} \sqrt{-i z} \sqrt{\frac{1}{1 - i \sqrt{2}\, z}} \sqrt{1 - i \sqrt{2}\, z} + i \sqrt{-\frac{i}{z}} \sqrt{i z} \sqrt{\frac{1}{\sqrt{2}\, i z + 1}} \sqrt{\sqrt{2}\, i z + 1} - \frac{\sqrt{z^4+z^2}}{z \sqrt{-z^2-1}}\right) - \frac{\sqrt{-2 z^2 - 1}}{2 z^2 \sqrt{2 z^2 + 1}} \sqrt{-\frac{z^2}{-z^2-1}} \sqrt{-z^2 \left(-z^2-1\right)} \sin^{-1}\left(2 z \sqrt{-z^2-1}\right)$$

Involving $\sinh^{-1}(i z)$

Involving $\sinh^{-1}(i z)$ and $\sin^{-1}(z)$

01.25.27.0010.01

$$\sinh^{-1}(i z) = i \sin^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$ and $\sin^{-1}\left(\sqrt{-z}\right)$

01.25.27.0085.01

$$\sinh^{-1}\left(\sqrt{z}\right) = i \sin^{-1}\left(\sqrt{-z}\right) /; 0 < \arg(z) \le \pi$$

01.25.27.0012.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -i \sin^{-1}\left(\sqrt{-z}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.0013.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -\frac{\sqrt{-z^2}}{z} \sin^{-1}\left(\sqrt{-z}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.25.27.0086.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; 0 < \arg(z) \le \pi$$

01.25.27.0087.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.0088.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{z} \sin^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.0089.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) \ge 0$$

01.25.27.0090.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0091.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sqrt{z}\,\sqrt{-\frac{1}{z}}\,\sin^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{c\,z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\sin^{-1}(i\,z)$

01.25.27.0092.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -i\sin^{-1}(i\,z)\;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0093.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = i\sin^{-1}(i\,z)\;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0094.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -\frac{i\sqrt{z^2}}{z}\sin^{-1}(i\,z)$$

Involving $\sinh^{-1}\left(\sqrt{-z^2}\right)$ and $\sin^{-1}(z)$

01.25.27.0095.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = -i\sin^{-1}(z)\;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0031.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = i\sin^{-1}(z)\;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0032.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \frac{\sqrt{-z^2}}{z}\sin^{-1}(z)$$

Involving $\sinh^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\sinh^{-1}(a\,(b\,z^c)^m)$ and $\sin^{-1}(i\,a\,b^m\,z^{m\,c})$

01.25.27.0096.01

$$\sinh^{-1}(a\,(b\,z^c)^m) = -\frac{i\,(b\,z^c)^m}{b^m\,z^{m\,c}}\sin^{-1}(i\,a\,b^m\,z^{m\,c})\;/;\; 2\,m \in \mathbb{Z}$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\sin^{-1}\left(\sqrt{z}\right)$

01.25.27.0097.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -i \sin^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2} \text{ /; } 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0015.02

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i \sin^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2} \text{ /; } \operatorname{Im}(z) < 0 \lor z > 1$$

01.25.27.0016.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{-(z-1)^2}}{z-1} \left(\sin^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1+c\,z}}{\sqrt{2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right)$ and $\sin^{-1}(z)$

01.25.27.0098.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = -\frac{i}{2}\left(\sin^{-1}(z) + \frac{\pi}{2}\right) \text{ /; } \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0099.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{i}{2}\left(\sin^{-1}(z) + \frac{\pi}{2}\right) \text{ /; } \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0017.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = -\frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\sin^{-1}(z) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right)$ and $\sin^{-1}(z)$

01.25.27.0100.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{i}{2}\left(\sin^{-1}(z) - \frac{\pi}{2}\right) \text{ /; } \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0101.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = -\frac{i}{2}\left(\sin^{-1}(z) - \frac{\pi}{2}\right) \text{ /; } 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0018.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(\sin^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0021.02

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)-\frac{\pi}{2}\right) /; \operatorname{Im}(z)>0 \lor 0<z<1$$

01.25.27.0102.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)-\frac{\pi}{2}\right) /; \operatorname{Im}(z)<0 \lor (z\in\mathbb{R} \land z>1)$$

01.25.27.0103.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)+\frac{\pi}{2}\right) /; (z\in\mathbb{R} \land z<0)$$

01.25.27.0022.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2}-\sqrt{\frac{1}{z}}\sqrt{z}\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0104.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)-\frac{\pi}{2}\right) /; 0<\arg(z)\leq\pi \bigvee (z\in\mathbb{R} \land 0<z<1)$$

01.25.27.0105.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)-\frac{\pi}{2}\right) /; \operatorname{Im}(z)<0 \lor (z\in\mathbb{R} \land z>1)$$

01.25.27.0106.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2}\left(\sqrt{z}\sqrt{-\frac{1}{z}}\, i-\sqrt{1-z}\sqrt{\frac{1}{1-z}}+1\right)-\frac{\sqrt{1-z}}{\sqrt{z-1}}\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0107.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0108.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0109.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0110.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \sqrt{\frac{1}{z}}\sqrt{-z}\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\sqrt{z}}{2\sqrt{-z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0111.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0112.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0113.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\sqrt{-z^2}}{z}\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0019.02

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0 \lor 0 < z < 1$$

01.25.27.0114.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0115.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0020.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \sin^{-1}\left(\frac{1}{\sqrt{z}}\right)\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{1}{z}}\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0116.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0117.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < 0)$$

01.25.27.0118.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\sqrt{\frac{1}{z}}\sqrt{z}\left(\frac{\pi}{2} - \sin^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0119.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \le \pi$$

01.25.27.0026.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; -\pi < \arg(z) \le 0$$

01.25.27.0027.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\sqrt{-z}}{2\sqrt{z}}\sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}}{4z}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0120.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0121.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0030.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(\frac{\pi}{2} - \sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0122.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{i}{2} \sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0123.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0025.02

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{\sqrt{-z-1}}{2\sqrt{z+1}}\left(\sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0124.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0125.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0126.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{\sqrt{z}}{2\sqrt{-z}}\left(\frac{\pi}{2} - \sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0023.02

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; 0 \le \arg(z) < \pi \bigvee z < -1$$

01.25.27.0127.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0024.02

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2\sqrt{\frac{z+1}{z}}}\sqrt{-\frac{z+1}{z}}\left(\sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0028.02

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0 \lor 0 < z < 1$$

01.25.27.0128.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = -\frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0029.02

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2\sqrt{\frac{z-1}{z}}}\sqrt{\frac{1-z}{z}}\left(\frac{\pi}{2} - \sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{a z^c - 1}\right)$

Involving $\sinh^{-1}\left(\sqrt{a z^c - 1}\right)$ and $\sin^{-1}\left(\sqrt{a}\; z^{c/2}\right)$

01.25.27.0033.02

$$\sinh^{-1}\left(\sqrt{z^2 - 1}\right) = \frac{i \pi}{2} - i \sin^{-1}(z) \;/;\; 0 < \arg(z) \le \frac{\pi}{2} \bigvee 0 < z < 1$$

01.25.27.0129.01

$$\sinh^{-1}\left(\sqrt{z^2 - 1}\right) = -\frac{i \pi}{2} + i \sin^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0130.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) == -\frac{i\pi}{2} - i\sin^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0131.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) == \frac{i\pi}{2} + i\sin^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0034.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) == \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\sqrt{z^2}}{z} \sin^{-1}(z) - \frac{\pi}{2}\right)$$

01.25.27.0041.01

$$\sinh^{-1}\left(\sqrt{a z^c - 1}\right) == \frac{\sqrt{-a}\ z^{c/2}}{\sqrt{a z^c}} \sin^{-1}\left(\sqrt{a}\ z^{c/2}\right) + \frac{i\pi}{2}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0036.02

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) == -\frac{\pi i}{2} + i\sin^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee 0 < z < 1$$

01.25.27.0132.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) == \frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0133.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) == -\frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0134.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) == \frac{\pi i}{2} + i\sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0037.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) == \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{\frac{1}{z^2}}\ \sqrt{-z^2}\ \sin^{-1}\left(\frac{1}{z}\right) /; z \notin (-1, 1)$$

01.25.27.0038.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\sqrt{z^2}\,\sqrt{1-z^2}}{z\sqrt{z^2-1}}\left(\frac{\pi}{2}-\sqrt{\frac{1}{z^2}}\,z\sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0135.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2}+i\sin^{-1}\left(\frac{1}{z}\right) /;\ 0<\arg(z)<\frac{\pi}{2}\bigvee(z\in\mathbb{R}\wedge 0<z<1)\bigvee(i z\in\mathbb{R}\wedge i z>0)$$

01.25.27.0136.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2}-i\sin^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\wedge z>1)$$

01.25.27.0137.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2}+i\sin^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2}<\arg(z)<\pi\bigvee(z\in\mathbb{R}\wedge z<-1)$$

01.25.27.0138.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2}-i\sin^{-1}\left(\frac{1}{z}\right) /;\ -\pi<\arg(z)<-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\wedge -1<z<0)\bigvee(i z\in\mathbb{R}\wedge i z<0)$$

01.25.27.0139.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\pi}{2}-\sqrt{\frac{1}{z^2}}\,z\sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0140.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2}-i\sin^{-1}\left(\frac{1}{z}\right) /;\ 0<\arg(z)<\frac{\pi}{2}\bigvee(i z\in\mathbb{R}\wedge i z>0)$$

01.25.27.0141.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + i\sin^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0142.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0143.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + i\sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0144.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2}}{\sqrt{z^2}}\left(\sqrt{\frac{1}{z^2}}\, z\sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0145.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} + i\sin^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0146.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0147.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} + i\sin^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0148.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0149.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{1}{\sqrt{1-\frac{1}{z^2}}}\sqrt{\frac{1}{z^2}-1}\left(\frac{\pi}{2}-\sqrt{\frac{1}{z^2}}\, z\sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$ and $\sin^{-1}(z)$

01.25.27.0035.02

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{2z^2}{\sqrt{-z^4}}\sin^{-1}(z) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.0150.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\left(\frac{\sqrt{z^2}}{z}-\sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}\,z+1}}\sqrt{\sqrt{2}\,z+1}+\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}\,z}}\sqrt{1-\sqrt{2}\,z}+\frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right)-\frac{2\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\sin^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0151.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\sin^{-1}\left(\frac{1}{z}\right) /; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.0152.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2}$$

$$\left(\pi\left(\frac{\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}z^3}{1-z^2}+\sqrt{\frac{1}{z^2}}z-\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}\right)-\right.$$

$$\left.4\sin^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$ and $\sin^{-1}(z)$

01.25.27.0153.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = -\frac{i}{2}\sin^{-1}(z)\ /;\ 0<\arg(z)\leq\pi$$

01.25.27.0039.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{i}{2}\sin^{-1}(z)\ /;\ -\pi<\arg(z)\leq 0$$

01.25.27.0040.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\sqrt{-z^2}}{2z}\sin^{-1}(z)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\Big/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\Big/\sqrt{2z^2}\right)$ and $\sin^{-1}(z)$

01.25.27.0154.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = -\frac{1}{2}\,i\sin^{-1}(z)\;/;\;0<\arg(z)\leq\frac{\pi}{2}\bigvee-\pi<\arg(z)\leq-\frac{\pi}{2}$$

01.25.27.0155.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2}\,i\sin^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)\leq\pi\bigvee-\frac{\pi}{2}<\arg(z)\leq 0$$

01.25.27.0156.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\sqrt{-z^4}}{2z^2}\sin^{-1}(z)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\Big/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\Big/\left(2z^2\right)}\right)$ and $\sin^{-1}(z)$

01.25.27.0157.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = -\frac{1}{2}\,i\sin^{-1}(z)\;/;\;0<\arg(z)<\frac{\pi}{2}\bigvee-\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.0158.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = \frac{1}{2}\,i\sin^{-1}(z)\;/;\;\frac{\pi}{2}\leq\arg(z)\leq\pi\bigvee-\frac{\pi}{2}\leq\arg(z)\leq 0$$

01.25.27.0159.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\sin^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z} \Big/ \sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z} \Big/ \sqrt{2z}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0160.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0161.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.0162.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0163.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{2} + \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0164.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0165.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi}{z\,4} \sqrt{-z^2} \left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2} \sqrt{-\frac{1}{z}} \sqrt{\frac{i}{z}} \sqrt{i z} \sqrt{z} \sin^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.25.27.0166.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{1}{2}\,i\sin^{-1}\left(\frac{1}{z}\right)\;/;\;0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0167.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right)\;/;\;-\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.0168.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{2} + \frac{1}{2}\,i\sin^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0169.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{\pi i}{2} - \frac{1}{2}\,i\sin^{-1}\left(\frac{1}{z}\right)\;/;\;-\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0170.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{2} - \frac{1}{2}\,i\sin^{-1}\left(\frac{1}{z}\right)\;/;\;(i\,z \in \mathbb{R} \land i\,z > 0)$$

01.25.27.0171.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) =$$

$$\frac{\pi}{4}\left(\sqrt{-\frac{1}{z^2}}\,z - \frac{2\sqrt{i\,z}\,\sqrt{z^2}}{z}\sqrt{\frac{i}{z}} - \sqrt{-\frac{1}{z^2}}\,\sqrt{z^2} + 4\,i - 2\,i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\sqrt{-\frac{1}{z^2}}\,z\sin^{-1}\left(\frac{1}{z}\right)$$

Involving $\cos^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}(i z)$

01.25.27.0042.01

$$\sinh^{-1}(z) = i \cos^{-1}(i z) - \frac{i \pi}{2}$$

Involving $\sinh^{-1}(i z)$ and $\cos^{-1}(z)$

01.25.27.0043.01

$$\sinh^{-1}(i z) = -i \cos^{-1}(z) + \frac{\pi i}{2}$$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}(1 + 2 z^2)$

01.25.27.0172.01

$$\sinh^{-1}(z) = \frac{i}{2} \cos^{-1}(2 z^2 + 1) /; 0 < \arg(z) \leq \pi$$

01.25.27.0173.01

$$\sinh^{-1}(z) = -\frac{i}{2} \cos^{-1}(2 z^2 + 1) /; -\pi < \arg(z) \leq 0$$

01.25.27.0174.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{2 z} \cos^{-1}(2 z^2 + 1)$$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{2}}\right)$

01.25.27.0175.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \cos^{-1}\left(\frac{\sqrt{1 + i z}}{\sqrt{2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{2}}\right)$

01.25.27.0176.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \cos^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}\left(\sqrt{-z^2}\right)$

01.25.27.0177.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{-z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0178.01

$$\sinh^{-1}(z) = i\cos^{-1}\left(\sqrt{-z^2}\right) - \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \le 0$$

01.25.27.0179.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\cos^{-1}\left(\sqrt{-z^2}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}\left(\sqrt{1+z^2}\right)$

01.25.27.0180.01

$$\sinh^{-1}(z) = i\cos^{-1}\left(\sqrt{z^2+1}\right) \;/;\; 0 < \arg(z) \le \pi$$

01.25.27.0181.01

$$\sinh^{-1}(z) = -i\cos^{-1}\left(\sqrt{z^2+1}\right) \;/;\; -\pi < \arg(z) \le 0$$

01.25.27.0182.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{z}\cos^{-1}\left(\sqrt{z^2+1}\right)$$

Involving $\sinh^{-1}(z)$ and $\cos^{-1}\left(2z\sqrt{-z^2-1}\right)$

01.25.27.0183.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^4}}{2z^2}\left(\cos^{-1}\left(2z\sqrt{-z^2-1}\right) - \frac{\pi}{2}\right) \;/;\; |\arg(z)| \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4}$$

01.25.27.0184.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{1}{1-i\sqrt{2}\,z}}\sqrt{1-i\sqrt{2}\,z} + i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}\,iz+1}}\sqrt{\sqrt{2}\,iz+1} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{\sqrt{-2z^2-1}}{2z^2\sqrt{2z^2+1}}\sqrt{-\frac{z^2}{-z^2-1}}\sqrt{-z^2\left(-z^2-1\right)}\left(\frac{\pi}{2} - \cos^{-1}\left(2z\sqrt{-z^2-1}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$ and $\cos^{-1}\left(\sqrt{-z}\right)$

01.25.27.0185.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} - i\cos^{-1}\left(\sqrt{-z}\right) \;/;\; 0 < \arg(z) \le \pi$$

01.25.27.0186.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} + i\cos^{-1}\left(\sqrt{-z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0187.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \frac{\sqrt{-z^2}}{z}\left(\cos^{-1}\left(\sqrt{-z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.25.27.0188.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.25.27.0189.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i\cos^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0190.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{\sqrt{-z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.0191.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i\cos^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) \geq 0$$

01.25.27.0192.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i\cos^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0193.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z}\,\sqrt{-\frac{1}{z}}\left(\cos^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{c\, z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\cos^{-1}(i\, z)$

01.25.27.0194.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = i\cos^{-1}(i z) - \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0195.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -i\cos^{-1}(i z) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0196.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \frac{i\sqrt{z^2}}{z}\left(\cos^{-1}(i z) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-z^2}\right)$ and $\cos^{-1}(z)$

01.25.27.0197.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = i\cos^{-1}(z) - \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0198.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = -i\cos^{-1}(z) + \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0199.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\sinh^{-1}(a\,(b\,z^c)^m)$ and $\cos^{-1}(i\,a\,b^m\,z^{m\,c})$

01.25.27.0200.01

$$\sinh^{-1}(a\,(b\,z^c)^m) = -\frac{i\,(b\,z^c)^m}{b^m\,z^{m\,c}}\left(\frac{\pi}{2} - \cos^{-1}(i\,a\,b^m\,z^{m\,c})\right) \;/;\; 2\,m \in \mathbb{Z}$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\cos^{-1}\left(\sqrt{z}\right)$

01.25.27.0201.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i\cos^{-1}\left(\sqrt{z}\right) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0202.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -i\cos^{-1}\left(\sqrt{z}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0203.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -\frac{\sqrt{-(z-1)^2}}{z-1} \cos^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1+c\,z}}{\sqrt{2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right)$ and $\cos^{-1}(z)$

01.25.27.0204.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} i \left(\cos^{-1}(z) - \pi\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0205.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} i \left(\pi - \cos^{-1}(z)\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0206.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{\sqrt{z+1}}{2\sqrt{-z-1}} \left(\cos^{-1}(z) - \pi\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right)$ and $\cos^{-1}(z)$

01.25.27.0207.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = -\frac{i}{2} \cos^{-1}(z) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0208.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{i}{2} \cos^{-1}(z) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0209.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = -\frac{\sqrt{1-z}}{2\sqrt{z-1}} \cos^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0210.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0211.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0212.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i\left(\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0213.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z}}\sqrt{z}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0214.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0215.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0216.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2}\left(\frac{i\sqrt{1-z}}{\sqrt{z-1}} + \sqrt{z}\sqrt{-\frac{1}{z}}\, i - \sqrt{1-z}\sqrt{\frac{1}{1-z}} + 1\right) + \frac{\sqrt{1-z}}{\sqrt{z-1}}\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0217.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0218.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.0219.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\left(\pi - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0220.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2}\left(\sqrt{z}\sqrt{\frac{1}{z}} - 1\right) - \sqrt{-z}\sqrt{\frac{1}{z}}\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0221.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) \le \pi$$

01.25.27.0222.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.0223.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\sqrt{-z^2}}{z}\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0224.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0225.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0226.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\left(\pi - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0227.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{1}{z}}\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0228.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0229.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < 0)$$

01.25.27.0230.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\sqrt{\frac{1}{z}}\sqrt{z}\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0231.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.25.27.0232.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.25.27.0233.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \frac{\sqrt{-z}}{2\sqrt{z}}\cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0234.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2}i\cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0235.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2}i\cos^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0236.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0237.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0238.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0239.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}}\left(\cos^{-1}\left(\frac{1}{z}\right) - \pi\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0240.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{1}{2}\, i \cos^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0241.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\, i \cos^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0242.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{\sqrt{z}}{2\sqrt{-z}}\cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0243.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0244.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0245.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2\sqrt{\frac{z+1}{z}}}\sqrt{-\frac{z+1}{z}}\left(-\cos^{-1}\left(\frac{1}{z}\right)+\pi\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0246.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = -\frac{1}{2}\,i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;\operatorname{Im}(z)>0 \lor (z\in\mathbb{R}\land 0<z<1)$$

01.25.27.0247.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2}\,i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;\operatorname{Im}(z)<0 \lor (z\in\mathbb{R}\land z<0)\lor(z\in\mathbb{R}\land z>1)$$

01.25.27.0248.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2\sqrt{\frac{z-1}{z}}}\sqrt{\frac{1-z}{z}}\cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{a\,z^c-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{a\,z^c-1}\right)$ and $\cos^{-1}\left(\sqrt{a}\;z^{c/2}\right)$

01.25.27.0249.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = i\cos^{-1}(z)\;/;\;0<\arg(z)\le\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.25.27.0250.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -i\cos^{-1}(z)\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.25.27.0251.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -i\pi+i\cos^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee(z\in\mathbb{R}\land z<-1)$$

01.25.27.0252.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = i\pi-i\cos^{-1}(z)\;/;\;-\pi<\arg(z)\le-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land -1<z<0)$$

01.25.27.0253.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\left(\frac{\pi}{2}-\cos^{-1}(z)\right)-\frac{\pi}{2}\right)$$

01.25.27.0254.01

$$\sinh^{-1}\left(\sqrt{a z^c - 1}\right) = \frac{\sqrt{-a}\; z^{c/2}}{\sqrt{a z^c}} \left(\frac{\pi}{2} - \cos^{-1}\left(\sqrt{a}\; z^{c/2}\right)\right) + \frac{i \pi}{2}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0255.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -i \cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0256.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = i \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0257.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\pi i + i \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0258.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \pi i - i \cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0259.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi \sqrt{-z^2}}{2 z} - \sqrt{\frac{1}{z^2}}\; \sqrt{-z^2} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right) /; z \notin (-1, 1)$$

01.25.27.0260.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\sqrt{z^2}\; \sqrt{1-z^2}}{z \sqrt{z^2 - 1}} \left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\; z \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0261.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -i\cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0262.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = i\cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0263.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \pi i - i\cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0264.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\pi i + i\cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0265.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0266.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = i\cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0267.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -i\cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \le 0$$

01.25.27.0268.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\pi i + i\cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \le \pi$$

01.25.27.0269.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \pi i - i\cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0270.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2}}{\sqrt{z^2}}\left(\sqrt{\frac{1}{z^2}}\,z\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{z}\right)\right)-\frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0271.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -i\cos^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0272.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = i\cos^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} \le \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0273.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \pi i - i\cos^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0274.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\pi i + i\cos^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0275.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{1}{\sqrt{1-\frac{1}{z^2}}}\sqrt{\frac{1}{z^2}-1}\left(\frac{\pi}{2}-\sqrt{\frac{1}{z^2}}\,z\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{z}\right)\right)\right)$$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$ and $\cos^{-1}(z)$

01.25.27.0276.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{2z^2}{\sqrt{-z^4}}\left(\frac{\pi}{2}-\cos^{-1}(z)\right) /;\ \frac{\pi}{4} \le |\arg(z)| \le \frac{3\pi}{4}$$

01.25.27.0277.01

$$\sinh^{-1}\left(2 z \sqrt{z^2-1}\right) = \frac{\pi \sqrt{1-2 z^2} \sqrt{z^4-z^2}}{2 \sqrt{-z^2} \sqrt{1-z^2} \sqrt{2 z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{\sqrt{2}\, z+1}} \sqrt{\sqrt{2}\, z+1} + \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{1}{1-\sqrt{2}\, z}} \sqrt{1-\sqrt{2}\, z} + \frac{\sqrt{z^4-z^2}}{z \sqrt{z^2-1}}\right) - \frac{2 \sqrt{1-2 z^2} \sqrt{z^4-z^2}}{\sqrt{-z^2} \sqrt{1-z^2} \sqrt{2 z^2-1}} \left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0278.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = -\frac{2 z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right) /;\ |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.0279.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = \frac{z}{2 \sqrt{-\frac{1}{z^2}} \sqrt{-z^4+3 z^2-2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-2} \left(\pi \left(\frac{\sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1-z^2}{z^4}}\, z^3}{1-z^2} + \sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} - 2\right) + 4 \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$ and $\cos^{-1}(z)$

01.25.27.0280.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{i}{2}\cos^{-1}(z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0281.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\pi i}{4} - \frac{i}{2}\cos^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0282.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\,/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\,/\sqrt{2z^2}\right)$ and $\cos^{-1}(z)$

01.25.27.0283.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2}\,i\cos^{-1}(z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0284.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\pi i}{4} - \frac{1}{2}\,i\cos^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0285.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\big/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\big/\left(2z^2\right)}\right)$ and $\cos^{-1}(z)$

01.25.27.0286.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}i\cos^{-1}(z)-\frac{\pi i}{4}\;/;\;0<\arg(z)<\frac{\pi}{2}\bigvee-\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.0287.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{\pi i}{4}-\frac{1}{2}i\cos^{-1}(z)\;/;\;\frac{\pi}{2}\leq\arg(z)\leq\pi\bigvee-\frac{\pi}{2}\leq\arg(z)\leq 0$$

01.25.27.0288.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\left(\frac{\pi}{2}-\cos^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z}\Big/\sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z}\Big/\sqrt{2z}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0289.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right)=\frac{\pi i}{4}-\frac{1}{2}i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;0\leq\arg(z)\leq\frac{\pi}{2}$$

01.25.27.0290.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right)=\frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4}\;/;\;-\frac{\pi}{2}<\arg(z)<0$$

01.25.27.0291.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \le \pi$$

01.25.27.0292.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0293.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0294.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{z}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.25.27.0295.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; 0 \le \arg(z) \le \frac{\pi}{2}$$

01.25.27.0296.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.0297.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0298.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0299.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0300.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi}{4}\left(z\sqrt{-z^{-2}}\sqrt{z+1}\sqrt{\frac{1}{z+1}} + \sqrt{-\frac{1}{z^2}}\, z - \frac{2\sqrt{i z}\sqrt{z^2}}{z}\sqrt{\frac{i}{z}} - \sqrt{-\frac{1}{z^2}}\sqrt{z^2} + 4i - 2i\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) - \frac{1}{2}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\sqrt{-\frac{1}{z^2}}\, z \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\tan^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$

01.25.27.0301.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0302.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0303.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0) \bigvee (z \in \mathbb{R} \land z > 0)$$

01.25.27.0304.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0305.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2+1}}{\sqrt{-z^2-1}} \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) + \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$

01.25.27.0306.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0307.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0308.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; (z \in \mathbb{R} \land z > 0) \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0309.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; (z \in \mathbb{R} \land z < 0) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0310.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}\sqrt{z^2+1}}{z\sqrt{-z^2-1}} \tan^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) + \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$

01.25.27.0311.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0312.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0313.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.25.27.0314.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0315.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z}\tan^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) + \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right)$

01.25.27.0316.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.25.27.0317.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /; 0 \leq \arg(z) < \pi$$

01.25.27.0318.01

$$\sinh^{-1}(z) = z\sqrt{-\frac{1}{z^2}}\left(\frac{\pi}{2} - \tan^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right)\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right)$

01.25.27.0319.01

$$\sinh^{-1}(z) = i\tan^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.0320.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0321.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) - \pi i /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0322.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) + \pi i /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0323.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\tan^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right)$

01.25.27.0324.01

$$\sinh^{-1}(z) = i\tan^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0325.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0326.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) - \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0327.01

$$\sinh^{-1}(z) = i\tan^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) + \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0328.01

$$\sinh^{-1}(z) = \frac{\pi\,i}{2}\left(\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z} - \sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1}\right) - \frac{\sqrt{-z^2}}{z}\tan^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right)$

01.25.27.0329.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0330.01

$$\sinh^{-1}(z) = i\tan^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0331.01

$$\sinh^{-1}(z) = -i\tan^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) + \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0332.01

$$\sinh^{-1}(z) = i \tan^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) - \pi i \,/;\, (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0333.01

$$\sinh^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-i z}} \sqrt{1-i z} - \sqrt{\frac{1}{i z+1}} \sqrt{i z+1}\right) + \frac{\sqrt{-z^2-1}}{z} \sqrt{\frac{z^2}{z^2+1}} \tan^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right)$

01.25.27.0334.01

$$\sinh^{-1}(z) = i \tan^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /;\, 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0335.01

$$\sinh^{-1}(z) = -i \tan^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /;\, -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0336.01

$$\sinh^{-1}(z) = \pi i - i \tan^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /;\, (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0337.01

$$\sinh^{-1}(z) = -\pi i + i \tan^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /;\, (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0338.01

$$\sinh^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-i z}} \sqrt{1-i z} - \sqrt{\frac{1}{i z+1}} \sqrt{i z+1}\right) + \frac{\sqrt{z} \sqrt{z^2+1}}{\sqrt{-z}} \sqrt{\frac{1}{z^2+1}} \tan^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{2 z \sqrt{-z^2-1}}{1+2 z^2}\right)$

01.25.27.0339.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^4}}{2 z^2} \tan^{-1}\left(\frac{2 z \sqrt{-z^2-1}}{2 z^2+1}\right) /;\, |\arg(z)| \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4}$$

01.25.27.0340.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{-\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{i\sqrt{2}\, z-1}}\sqrt{i\sqrt{2}\, z-1} + i\sqrt{\frac{i}{z}}\sqrt{-i z}\sqrt{-i\sqrt{2}\, z-1}\sqrt{-\frac{1}{\sqrt{2}\, i z+1}} + \frac{z\sqrt{-z^2-1}}{\sqrt{z^4+z^2}}\right) + \frac{\sqrt{z^2+1}}{2\sqrt{-z^2-1}}\tan^{-1}\left(\frac{2 z\sqrt{-z^2-1}}{2 z^2+1}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{1+2z^2}{2z\sqrt{-1-z^2}}\right)$

01.25.27.0341.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} i \tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.0342.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} i \tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.0343.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} i \tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0) \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0344.01

$$\sinh^{-1}(z) = -\frac{i}{2}\tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) - \frac{\pi i}{4} /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0345.01

$$\sinh^{-1}(z) = -\frac{i}{2}\tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) - \frac{3\pi i}{4} /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0346.01

$$\sinh^{-1}(z) = -\frac{i}{2}\tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) + \frac{3\pi i}{4} /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0347.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2-1}}{2\sqrt{z^2+1}}\tan^{-1}\left(\frac{2 z^2+1}{2 z\sqrt{-z^2-1}}\right) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\, z - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}} + \sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right)$

01.25.27.0348.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{-i z - 1}}{\sqrt{i z - 1}}\right) /;\ i z \notin (-1, \infty)$$

01.25.27.0349.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{-i z - 1}}{\sqrt{i z - 1}}\right) /;\ (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.0350.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{-i z - 1}}{\sqrt{i z - 1}}\right) /;\ (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.25.27.0351.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{i z - 1} \sqrt{i z + 1}}{\sqrt{-i z - 1} \sqrt{1 - i z}} \tan^{-1}\left(\frac{\sqrt{-i z - 1}}{\sqrt{i z - 1}}\right) + \left(\sqrt{1 - z i} \sqrt{\frac{1}{1 - z i}} - \frac{1}{2}\right) \pi i$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right)$

01.25.27.0352.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{1 + i z}}{\sqrt{1 - i z}}\right) /;\ i z \notin (1, \infty)$$

01.25.27.0353.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{1 + i z}}{\sqrt{1 - i z}}\right) /;\ (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.0354.01

$$\sinh^{-1}(z) = -2 i \tan^{-1}\left(\frac{\sqrt{1 + i z}}{\sqrt{1 - i z}}\right) + \left(\sqrt{1 - z i} \sqrt{\frac{1}{1 - z i}} - \frac{1}{2}\right) \pi i$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right)$

01.25.27.0355.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{-z - i}}\right) /;\ |\mathrm{Im}(z)| < 1 \bigvee 0 \le \arg(z) \le \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0356.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{-z - i}}\right) /;\ \mathrm{Re}(z) < 0 \wedge \mathrm{Im}(z) \ge 1 \vee \mathrm{Re}(z) > 0 \wedge \mathrm{Im}(z) \le -1$$

01.25.27.0357.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{-z - i}}\right) /;\ (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.0358.01

$$\sinh^{-1}(z) = -\frac{2\,i\sqrt{1-i\,z}\,\sqrt{-i+z}}{\sqrt{-i-z}\,\sqrt{i\,z+1}}\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right)+\left(\sqrt{1-z\,i}\,\sqrt{\frac{1}{1-z\,i}}-\frac{1}{2}\right)\pi\,i$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$

01.25.27.0359.01

$$\sinh^{-1}(z) = \frac{\pi\,i}{2}-2\,i\tan^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)/;\ |\mathrm{Im}(z)|\leq 1\bigvee\frac{\pi}{2}<\arg(z)\leq\pi\bigvee-\frac{\pi}{2}<\arg(z)\leq 0$$

01.25.27.0360.01

$$\sinh^{-1}(z) = \frac{\pi\,i}{2}+2\,i\tan^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)/;\ \mathrm{Re}(z)\geq 0\land\mathrm{Im}(z)>1\lor\mathrm{Re}(z)<0\land\mathrm{Im}(z)<-1$$

01.25.27.0361.01

$$\sinh^{-1}(z) = -\frac{3\,\pi\,i}{2}+2\,i\tan^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)/;\ (i\,z\in\mathbb{R}\land i\,z>1)$$

01.25.27.0362.01

$$\sinh^{-1}(z) = -\frac{2\,i\sqrt{i-z}\,\sqrt{1-i\,z}}{\sqrt{i\,z+1}\,\sqrt{i+z}}\tan^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)+\left(\sqrt{1-z\,i}\,\sqrt{\frac{1}{1-z\,i}}-\frac{1}{2}\right)\pi\,i$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$

01.25.27.0363.01

$$\sinh^{-1}(z) = \frac{\pi\,i}{2}-2\,i\tan^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)/;\ i\,z\notin(1,\infty)$$

01.25.27.0364.01

$$\sinh^{-1}(z) = -\frac{3\,\pi\,i}{2}+2\,i\tan^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)/;\ (i\,z\in\mathbb{R}\land i\,z>1)$$

01.25.27.0365.01

$$\sinh^{-1}(z) = -2\,i\sqrt{1-z\,i}\,\sqrt{\frac{1}{1-z\,i}}\tan^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)+\left(\sqrt{1-z\,i}\,\sqrt{\frac{1}{1-z\,i}}-\frac{1}{2}\right)\pi\,i$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{-i\,z-1}}\right)$

01.25.27.0366.01

$$\sinh^{-1}(z) = -\frac{\pi\,i}{2}-2\,i\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{-i\,z-1}}\right)/;\ i\,z\notin(-\infty,1)$$

01.25.27.0367.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{-i z - 1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.0368.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{-i z - 1}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0369.01

$$\sinh^{-1}(z) = \pi i \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) - 2 i \sqrt{\frac{z^2 + 1}{z^2}} \sqrt{\frac{z^2}{z^2 + 1}} \tan^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{-i z - 1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{1 + i z}}\right)$

01.25.27.0370.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{1 + i z}}\right) /; i z \notin (-\infty, -1)$$

01.25.27.0371.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{1 + i z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0372.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{1 + z i} \sqrt{\frac{1}{1 + z i}}\right) + 2 i \tan^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{1 + i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-z - i}}{\sqrt{z - i}}\right)$

01.25.27.0373.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{-z - i}}{\sqrt{z - i}}\right) /; |\mathrm{Im}(z)| < 1 \bigvee 0 \le \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.25.27.0374.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{-z - i}}{\sqrt{z - i}}\right) /; \mathrm{Re}(z) < 0 \land \mathrm{Im}(z) \ge 1 \lor \mathrm{Re}(z) > 0 \land \mathrm{Im}(z) \le -1$$

01.25.27.0375.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{-z - i}}{\sqrt{z - i}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0376.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) + \frac{2 i \sqrt{1 - i z} \sqrt{-i + z}}{\sqrt{-i - z} \sqrt{i z + 1}} \tan^{-1}\left(\frac{\sqrt{-z - i}}{\sqrt{z - i}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$

01.25.27.0377.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; |\mathrm{Im}(z)| \leq 1 \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0378.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \mathrm{Re}(z) > 0 \land \mathrm{Im}(z) > 1 \lor \mathrm{Re}(z) \leq 0 \land \mathrm{Im}(z) < -1$$

01.25.27.0379.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0380.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) + \frac{2 i \sqrt{i - z} \sqrt{1 - i z}}{\sqrt{i z + 1} \sqrt{i + z}} \tan^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$

01.25.27.0381.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; i z \notin (-\infty, -1)$$

01.25.27.0382.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0383.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) + 2 i \sqrt{\frac{1}{i z + 1}} \sqrt{i z + 1} \tan^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$$

Involving $\sinh^{-1}\left(\frac{2 z}{1-z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2 z}{1-z^2}\right)$ and $\tan^{-1}(i z)$

01.25.27.0384.01

$$\sinh^{-1}\left(\frac{2 z}{1 - z^2}\right) = -2 i \tan^{-1}(i z) /; |z| < 1$$

01.25.27.0385.01

$$\sinh^{-1}\left(\frac{2 z}{1 - z^2}\right) = \pi i + 2 i \tan^{-1}(i z) /; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.25.27.0386.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi i + 2 i \tan^{-1}(i z) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.25.27.0387.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2 i \tan^{-1}(i z) - \frac{\pi \sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.25.27.0388.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\frac{\pi \sqrt{-z^2}}{2z} \left(1 - \frac{1 - i z}{1 + i z} \sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2}\right) - \frac{2 i (1 - i z)}{1 + i z} \sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} \tan^{-1}(i z)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.25.27.0389.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi i - 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.25.27.0390.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi i - 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0))$$

01.25.27.0391.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi \sqrt{-\frac{1}{z^2}}\, z - 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1$$

01.25.27.0392.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| > 1$$

01.25.27.0393.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{1}{2} \pi z \sqrt{-\frac{1}{z^2}} \left(\frac{1 - i z}{1 + i z} \sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} + 1\right) - \frac{2 i (1 - i z)}{1 + i z} \sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} \tan^{-1}\left(\frac{i}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\tan^{-1}(i z^r)$

01.25.27.0394.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2 i^{-\frac{i+z}{i-z} \sqrt{\left(\frac{i-z}{i+z}\right)^2}} \tan^{-1}\left(i z^{\frac{i+z}{i-z} \sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\tan^{-1}(i z)$

01.25.27.0395.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = 2i\tan^{-1}(iz) \;/;\; |z|<1$$

01.25.27.0396.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i - 2i\tan^{-1}(iz) \;/;\; |z|>1 \bigwedge 0<\arg(z)\le\pi$$

01.25.27.0397.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i - 2i\tan^{-1}(iz) \;/;\; |z|>1 \bigwedge -\pi<\arg(z)\le 0$$

01.25.27.0398.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2i\tan^{-1}(iz) + \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z|>1$$

01.25.27.0399.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tan^{-1}(iz) + \frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.25.27.0400.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i + 2i\tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z|<1 \land (\operatorname{Im}(z)>0 \lor (z\in\mathbb{R} \land z>0))$$

01.25.27.0401.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i + 2i\tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z|<1 \land (\operatorname{Im}(z)<0 \lor (z\in\mathbb{R} \land z<0))$$

01.25.27.0402.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi\sqrt{-\frac{1}{z^2}}\,z + 2i\tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z|<1$$

01.25.27.0403.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2i\tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z|>1$$

01.25.27.0404.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) + \frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tan^{-1}\left(\frac{i}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\tan^{-1}(i z^r)$

01.25.27.0405.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2\,i^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}} \tan^{-1}\left(i\,z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.25.27.0406.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0407.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0408.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\sqrt{-z-1}}{\sqrt{z+1}}\left(\tan^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0409.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0410.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0411.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0412.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}} - 1\right) - \frac{\sqrt{-1-z}}{\sqrt{1+z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0413.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0414.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.0415.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.0416.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}} - 1\right) - \frac{\sqrt{-1-z}}{\sqrt{1+z}}\sqrt{z}\sqrt{\frac{1}{z}}\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.25.27.0417.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) \geq 0$$

01.25.27.0418.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0419.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -\sqrt{z}\sqrt{-\frac{1}{z}}\left(\tan^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0420.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.0421.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0422.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.0423.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \sqrt{-\frac{1}{z+1}}\,\sqrt{z+1}\,\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\,i}{2}\left(1-\sqrt{\frac{z}{z+1}}\,\sqrt{\frac{z+1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0424.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ 0 \leq \arg(z) < \pi$$

01.25.27.0425.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0426.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi\,i /;\ (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0427.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \sqrt{-\frac{1}{z+1}}\,\sqrt{z+1}\,\sqrt{z}\,\sqrt{\frac{1}{z}}\,\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\,i}{2}\left(1-\sqrt{\frac{z}{z+1}}\,\sqrt{\frac{z+1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.25.27.0428.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -i\tan^{-1}\left(\sqrt{z}\right) /;\ \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0429.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = i\tan^{-1}\left(\sqrt{z}\right) /;\ -\pi < \arg(z) \leq 0$$

01.25.27.0430.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\pi\,i + i\tan^{-1}\left(\sqrt{z}\right) /;\ (z \in \mathbb{R} \land z < -1)$$

01.25.27.0431.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}-1\right) + \tan^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0432.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0433.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0434.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0435.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0436.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}} - \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0437.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0438.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0439.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}} - \sqrt{\frac{1}{z}}\sqrt{-\frac{z}{1+z}}\sqrt{1+z}\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.25.27.0440.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0441.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = -i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0442.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \pi i - i\tan^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0443.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \sqrt{-z-1}\sqrt{\frac{1}{z+1}}\left(\frac{\pi}{2}\left(1-\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) - \tan^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0444.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0445.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.0446.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0447.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \sqrt{-1-z}\sqrt{\frac{1}{1+z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\sqrt{z}}{2\sqrt{-z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0448.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) \le \pi$$

01.25.27.0449.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.0450.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \frac{\sqrt{z}}{\sqrt{-z}}\left(\frac{\pi}{2} - \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.25.27.0451.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -i\tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0452.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = i\tan^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0453.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \pi i - i\tan^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0454.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\sqrt{-z}}{\sqrt{z}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1} - 1\right) + \tan^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0455.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0456.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0457.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0458.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\sqrt{-z}}{\sqrt{z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\sqrt{-z-1}}{2}\sqrt{\frac{1}{z+1}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0459.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0460.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) \leq 0$$

01.25.27.0461.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \sqrt{-z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$ and $\tan^{-1}(z)$

01.25.27.0462.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - i \tan^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0463.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} + i \tan^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0464.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} - i \tan^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0465.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} + i \tan^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0466.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}} \left(\frac{\sqrt{z^2}}{z} \tan^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0467.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = i\tan^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0468.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0469.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0470.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = i\tan^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0471.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\pi i}{2}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z+1}} + \frac{\sqrt{i z-1}}{\sqrt{1-i z}}\right) - \frac{\sqrt{z^2}}{z}\tan^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$ and $\tan^{-1}(z)$

01.25.27.0472.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi i}{2} - i\tan^{-1}(z) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0473.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -\frac{\pi i}{2} + i\tan^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.0474.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -\frac{\pi i}{2} - i\tan^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.0475.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi i}{2} + i\tan^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.0476.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \sqrt{-\frac{1}{z^2+1}}\,\sqrt{z^2+1}\left(\frac{\pi}{2}-\frac{\sqrt{z^2}}{z}\tan^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0477.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) = i\tan^{-1}\left(\frac{1}{z}\right)\;/;\; 0\le\arg(z)<\frac{\pi}{2}\bigvee\frac{\pi}{2}<\arg(z)<\pi\bigvee(i\,z\in\mathbb{R}\land i\,z<-1)$$

01.25.27.0478.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -i\tan^{-1}\left(\frac{1}{z}\right)\;/;\; -\pi<\arg(z)<-\frac{\pi}{2}\bigvee-\frac{\pi}{2}<\arg(z)<0\bigvee(i\,z\in\mathbb{R}\land i\,z>1)$$

01.25.27.0479.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = i\tan^{-1}\left(\frac{1}{z}\right)+\pi\,i\;/;\;(i\,z\in\mathbb{R}\land-1<i\,z<0)$$

01.25.27.0480.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -i\tan^{-1}\left(\frac{1}{z}\right)+\pi\,i\;/;\;(i\,z\in\mathbb{R}\land 0<i\,z<1)$$

01.25.27.0481.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \sqrt{-\frac{1}{z^2+1}}\,\sqrt{z^2+1}\left(\frac{\sqrt{z^2}}{z}\tan^{-1}\left(\frac{1}{z}\right)-\frac{\pi\,i}{2}\left(\frac{\sqrt{-i\,z-1}}{\sqrt{i\,z+1}}+\frac{\sqrt{i\,z-1}}{\sqrt{1-i\,z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$ and $\tan^{-1}(z)$

01.25.27.0482.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = i\tan^{-1}(z)\;/;\; 0<\arg(z)<\frac{\pi}{2}\bigvee-\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.0483.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)\le\pi\bigvee-\frac{\pi}{2}<\arg(z)\le 0\bigvee(i\,z\in\mathbb{R}\land-1<i\,z<1)$$

01.25.27.0484.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}(z) - \pi i \,/;\, (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0485.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}(z) + \pi i \,/;\, (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0486.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}(z) + \pi i \,/;\, (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0044.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-i z}}\sqrt{1-i z} - \sqrt{\frac{1}{i z+1}}\sqrt{i z+1}\right) - \sqrt{-z^2-1}\sqrt{\frac{1}{z^2+1}}\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0487.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /;\, 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.0488.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /;\, -\frac{\pi}{2} \le \arg(z) \le 0$$

01.25.27.0489.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /;\, \frac{\pi}{2} \le \arg(z) \le \pi$$

01.25.27.0490.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /;\, -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0491.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-1-z^2}}\right)$ and $\tan^{-1}(z)$

01.25.27.0492.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = i\tan^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.0493.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0494.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = i\tan^{-1}(z) + \pi i \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0495.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -i\tan^{-1}(z) + \pi i \;/;\; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0496.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(\sqrt{\frac{1}{1-iz}}\sqrt{1-iz} - \sqrt{\frac{1}{iz+1}}\sqrt{iz+1}\right) - \sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\tan^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-1-z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0497.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0498.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0499.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0500.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0501.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{z^2}}{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{-z^2-1}\,\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{2\,z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$ and $\tan^{-1}(z)$

01.25.27.0502.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -i\tan^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0503.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = i\tan^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0504.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -i\tan^{-1}(z) - \pi\,i \;/;\; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0505.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = i\tan^{-1}(z) - \pi\,i \;/;\; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0506.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi\,i}{2}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right) - \frac{\sqrt{z}\,\sqrt{z^2+1}}{\sqrt{-z}}\,\sqrt{\frac{1}{z^2+1}}\,\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0507.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -\frac{\pi\,i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0508.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = \frac{\pi\,i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0509.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0510.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0511.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2-1}}{2\sqrt{z^2+1}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$ and $\tan^{-1}(z)$

01.25.27.0512.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -i\tan^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0513.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = i\tan^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0514.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = i\tan^{-1}(z) + \pi i /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0515.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -i\tan^{-1}(z) + \pi i /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0516.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2}\left(1 - \sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\right) - \frac{\sqrt{z}}{\sqrt{-z}}\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0517.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.0518.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} \le \arg(z) \le 0$$

01.25.27.0519.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0520.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} \le \arg(z) \le \pi$$

01.25.27.0521.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\sqrt{z}}{\sqrt{-z}}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\sqrt{-z^2-1}\sqrt{\frac{1}{z^2+1}}$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1+z^2}} \Big/ \left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1+z^2}} \Big/ \left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\tan^{-1}(z)$

01.25.27.0522.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = -\frac{i}{2}\tan^{-1}(z) /;\ 0 < \arg(z) \le \pi$$

01.25.27.0523.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{i}{2}\tan^{-1}(z)\ /;\ -\pi < \arg(z) \leq 0$$

01.25.27.0524.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{\sqrt{-z^2}}{2\,z}\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0525.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4}\ /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0526.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{4}\ /;\ -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0527.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{1}{2}\,i\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{4}\ /;\ \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0528.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4}\ /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0529.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = -\frac{\sqrt{-z^2}}{2\,z}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{4}\left(-i\sqrt{\frac{1}{z^2}}\,\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\tan^{-1}(z)$

01.25.27.0530.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{1}{2}\,i\tan^{-1}(z) - \frac{\pi\,i}{4}\;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0531.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = -\frac{i}{2}\tan^{-1}(z) + \frac{\pi\,i}{4}\;/;\; \mathrm{Im}(z) \geq 0$$

01.25.27.0532.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = -\frac{i}{2}\tan^{-1}(z) - \frac{3\,\pi\,i}{4}\;/;\; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0533.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{\pi}{4}\left(-i + i\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z} + \sqrt{-\frac{1}{z}}\,\sqrt{z}\right) - \frac{1}{2}\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\,\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0534.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right)\;/;\; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0535.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0536.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{1}{2}\,i\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0537.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0538.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} /; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0539.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z}\left(z\sqrt{\frac{1}{z^2}}-1\right) - 2\,i + i\sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1} + i\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\right) + \frac{1}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\,\tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}(z)$

01.25.27.0540.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{1}{2}\,i\tan^{-1}(z) /; 0 < \arg(z) \leq \pi$$

01.25.27.0541.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{1}{2}\,i\tan^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0542.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{\sqrt{-z^2}}{2\,z}\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1+z^2}\right)\Big/\left(2\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0543.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4} \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0544.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0545.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{4} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0546.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0547.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = -\frac{\sqrt{-z^2}}{2\,z}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{4}\left(-i\sqrt{\frac{1}{z^2}}\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{1+z^2}\right)\Big/\left(2\sqrt{1+z^2}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{1+z^2}\right)\Big/\left(2\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}(z)$

01.25.27.0548.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{1}{2}\,i\tan^{-1}(z) - \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0549.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) \geq 0$$

01.25.27.0550.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}(z) + \frac{3\pi i}{4} \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0551.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{\pi}{4}\left(2 i - 2 i \sqrt{\frac{1}{1-i z}}\sqrt{1-i z} + \sqrt{-\frac{1}{z}}\sqrt{z}\right) - \frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\tan^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{1+z^2}\right)\big/\left(2\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.25.27.0552.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) \;/;\; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0553.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0554.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{1}{2}\,i\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0555.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0556.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.0557.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) ==$$

$$\frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z}\left(z\sqrt{\frac{1}{z^2}}-1\right) + i\sqrt{\frac{1}{i z+1}}\sqrt{i z+1} - i\sqrt{1-i z}\sqrt{\frac{1}{1-i z}}\right) + \frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\cot^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$

01.25.27.0558.01

$$\sinh^{-1}(z) = i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.25.27.0559.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0560.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) - \pi i \;/;\; (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.0561.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) + \pi i \;/;\; (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.27.0562.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}(i-z)\right) + \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$

01.25.27.0563.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0564.01

$$\sinh^{-1}(z) = i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0565.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) + \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0566.01

$$\sinh^{-1}(z) = i\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) - \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0567.01

$$\sinh^{-1}(z) = \frac{\pi\,i}{2}\left(\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z} - \sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1}\right) + \frac{\sqrt{-z^2-1}}{z}\sqrt{\frac{z^2}{z^2+1}}\,\cot^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$

01.25.27.0568.01

$$\sinh^{-1}(z) = i\cot^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0569.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0570.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) - \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0571.01

$$\sinh^{-1}(z) = i\cot^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) + \pi\,i /;\ (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0572.01

$$\sinh^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-iz}}\,\sqrt{1-iz} - \sqrt{\frac{1}{iz+1}}\,\sqrt{iz+1}\right) - \frac{\sqrt{-z^2}}{z}\cot^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right)$

01.25.27.0573.01

$$\sinh^{-1}(z) = i\cot^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /;\ 0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0574.01

$$\sinh^{-1}(z) = -i\cot^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0575.01

$$\sinh^{-1}(z) = \pi i + i\cot^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /;\ (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0576.01

$$\sinh^{-1}(z) = -\pi i - i\cot^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /;\ (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0577.01

$$\sinh^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-iz}}\,\sqrt{1-iz} - \sqrt{\frac{1}{iz+1}}\,\sqrt{iz+1}\right) + z\sqrt{-\frac{1}{z^2}}\cot^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$

01.25.27.0578.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i\cot^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0579.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i\cot^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0580.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \cot^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0) \bigvee (z \in \mathbb{R} \land z > 0)$$

01.25.27.0581.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \cot^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0582.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2+1}}{\sqrt{-z^2-1}} \cot^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) + \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$

01.25.27.0583.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \cot^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0584.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \cot^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0585.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i \cot^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.25.27.0586.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i \cot^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0587.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \cot^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) + \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right)$

01.25.27.0588.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i \cot^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0589.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i\cot^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0590.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i\cot^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) /; (z \in \mathbb{R} \land z > 0) \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0591.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i\cot^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) /; (z \in \mathbb{R} \land z < 0) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0592.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}\sqrt{z^2+1}}{z\sqrt{-z^2-1}} \cot^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) + \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right)$

01.25.27.0593.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0594.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0595.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /; (z \in \mathbb{R} \land z > 0) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0596.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right) /; (z \in \mathbb{R} \land z < 0) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0597.01

$$\sinh^{-1}(z) = \frac{1}{2}\pi z\sqrt{-\frac{1}{z^2}} - \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}} \cot^{-1}\left(\sqrt{-\frac{z^2}{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right)$

01.25.27.0598.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} i \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.0599.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} i \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.0600.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} i \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0) \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0601.01

$$\sinh^{-1}(z) = -\frac{i}{2} \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) - \frac{\pi i}{4} /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0602.01

$$\sinh^{-1}(z) = -\frac{i}{2} \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) - \frac{3\pi i}{4} /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0603.01

$$\sinh^{-1}(z) = -\frac{i}{2} \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) + \frac{3\pi i}{4} /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0604.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2-1}}{2\sqrt{z^2+1}} \cot^{-1}\left(\frac{2z\sqrt{-1-z^2}}{1+2z^2}\right) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\, z - \sqrt{i z+1}\,\sqrt{\frac{1}{i z+1}} + \sqrt{\frac{1}{1-i z}}\,\sqrt{1-i z}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{1+2z^2}{2z\sqrt{-z^2-1}}\right)$

01.25.27.0605.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^4}}{2z^2} \cot^{-1}\left(\frac{1+2z^2}{2z\sqrt{-z^2-1}}\right) /; |\arg(z)| \leq \frac{\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{3\pi}{4}$$

01.25.27.0606.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{-\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{i\sqrt{2}\,z-1}}\sqrt{i\sqrt{2}\,z-1} + i\sqrt{\frac{i}{z}}\sqrt{-i z}\sqrt{-i\sqrt{2}\,z-1}\sqrt{-\frac{1}{\sqrt{2}\,i z+1}} + \frac{z\sqrt{-z^2-1}}{\sqrt{z^4+z^2}}\right) + \frac{\sqrt{z^2+1}}{2\sqrt{-z^2-1}}\cot^{-1}\left(\frac{1+2z^2}{2z\sqrt{-z^2-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right)$

01.25.27.0607.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2i\cot^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right) /;\ i z \notin (-\infty, 1)$$

01.25.27.0608.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2i\cot^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right) /;\ (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.0609.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} - 2i\cot^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right) /;\ (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0610.01

$$\sinh^{-1}(z) = \pi i\left(\frac{1}{2} - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}}\right) - 2i\sqrt{\frac{z^2+1}{z^2}}\sqrt{\frac{z^2}{z^2+1}}\cot^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right)$

01.25.27.0611.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2i\cot^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /;\ i z \notin (-\infty, -1)$$

01.25.27.0612.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2i\cot^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /;\ (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0613.01

$$\sinh^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{1+z i}\sqrt{\frac{1}{1+z i}}\right) + 2i\cot^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right)$

01.25.27.0614.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right) /; |\mathrm{Im}(z)| < 1 \bigvee 0 \leq \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0615.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right) /; \mathrm{Re}(z) < 0 \land \mathrm{Im}(z) \geq 1 \lor \mathrm{Re}(z) > 0 \land \mathrm{Im}(z) \leq -1$$

01.25.27.0616.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0617.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) + \frac{2 i \sqrt{1 - i z} \sqrt{-i + z}}{\sqrt{-i - z} \sqrt{i z + 1}} \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$

01.25.27.0618.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; |\mathrm{Im}(z)| \leq 1 \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0619.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \mathrm{Re}(z) > 0 \land \mathrm{Im}(z) > 1 \lor \mathrm{Re}(z) \leq 0 \land \mathrm{Im}(z) < -1$$

01.25.27.0620.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0621.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) + \frac{2 i \sqrt{i - z} \sqrt{1 - i z}}{\sqrt{i z + 1} \sqrt{i + z}} \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$

01.25.27.0622.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; i z \notin (-\infty, -1) \bigwedge i z \notin (1, \infty)$$

01.25.27.0623.01

$$\sinh^{-1}(z) = \frac{3 \pi i}{2} + 2 i \cot^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0624.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0625.01

$$\sinh^{-1}(z) = \frac{i \pi}{2}\left(1 - 2\sqrt{\frac{1}{i z+1}} \sqrt{i z+1}\right) + 2 i \sqrt{\frac{1}{1-z i}} \sqrt{1-z i} \cot^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{-i z-1}}\right)$

01.25.27.0626.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{-i z-1}}\right) /; i z \notin (-1, \infty)$$

01.25.27.0627.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{-i z-1}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0628.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{-i z-1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.0629.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{i z-1} \sqrt{i z+1}}{\sqrt{-i z-1} \sqrt{1-i z}} \cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{-i z-1}}\right) + \left(\sqrt{1-z i} \sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right) \pi i$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right)$

01.25.27.0630.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; i z \notin (1, \infty)$$

01.25.27.0631.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0632.01

$$\sinh^{-1}(z) = -2 i \cot^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) + \left(\sqrt{1-z i} \sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right) \pi i$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right)$

01.25.27.0633.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) /; |\mathrm{Im}(z)| < 1 \bigvee 0 \le \arg(z) \le \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0634.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq -1$$

01.25.27.0635.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0636.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{1-i z} \sqrt{-i+z}}{\sqrt{-i-z} \sqrt{i z+1}} \cot^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) + \left(\sqrt{1-z i} \sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right) \pi i$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$

01.25.27.0637.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; |\operatorname{Im}(z)| \leq 1 \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0638.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < -1$$

01.25.27.0639.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0640.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{i-z} \sqrt{1-i z}}{\sqrt{i z+1} \sqrt{i+z}} \cot^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) + \left(\sqrt{1-z i} \sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right) \pi i$$

Involving $\sinh^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$

01.25.27.0641.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; i z \notin (1, \infty) \bigwedge i z \notin (-\infty, -1)$$

01.25.27.0642.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0643.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0644.01

$$\sinh^{-1}(z) = -2\,i\,\sqrt{1+z\,i}\,\sqrt{\frac{1}{1+z\,i}}\,\cot^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) + \left(\sqrt{1-z\,i}\,\sqrt{\frac{1}{1-z\,i}} - \frac{1}{2}\right)\pi\,i$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\cot^{-1}(i\,z)$

01.25.27.0645.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi\,i + 2\,i\cot^{-1}(i\,z)\;/;\;|z| < 1 \land (\text{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.25.27.0646.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi\,i + 2\,i\cot^{-1}(i\,z)\;/;\;|z| < 1 \land (\text{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.25.27.0647.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi\sqrt{-\frac{1}{z^2}}\;z + 2\,i\cot^{-1}(i\,z)\;/;\;|z| < 1$$

01.25.27.0648.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2\,i\cot^{-1}(i\,z)\;/;\;|z| > 1$$

01.25.27.0649.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{1}{2}\pi\,z\sqrt{-\frac{1}{z^2}}\left(\frac{1-i\,z}{1+i\,z}\sqrt{\left(\frac{i\,z+1}{i\,z-1}\right)^2} + 1\right) + \frac{2\,i\,(1-i\,z)}{1+i\,z}\sqrt{\left(\frac{i\,z+1}{i\,z-1}\right)^2}\cot^{-1}(i\,z)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.25.27.0650.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2\,i\cot^{-1}\left(\frac{i}{z}\right)\;/;\;|z| < 1$$

01.25.27.0651.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi\,i - 2\,i\cot^{-1}\left(\frac{i}{z}\right)\;/;\;|z| > 1 \bigwedge 0 < \arg(z) \le \pi$$

01.25.27.0652.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi\,i - 2\,i\cot^{-1}\left(\frac{i}{z}\right)\;/;\;|z| > 1 \bigwedge -\pi < \arg(z) \le 0$$

01.25.27.0653.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2\,i\cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi\sqrt{-z^2}}{z}\;/;\;|z| > 1$$

01.25.27.0654.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\; i\cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi\sqrt{-z^2}}{2z}\left(1 - \frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\cot^{-1}(i z^r)$

01.25.27.0655.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2\, i^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}} \cot^{-1}\left(i\, z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\cot^{-1}(i z)$

01.25.27.0656.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i - 2\, i\cot^{-1}(i z) \;/;\; |z| < 1 \land (\mathrm{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.25.27.0657.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i - 2\, i\cot^{-1}(i z) \;/;\; |z| < 1 \land (\mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.25.27.0658.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi\sqrt{-\frac{1}{z^2}}\, z - 2\, i\cot^{-1}(i z) \;/;\; |z| < 1$$

01.25.27.0659.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = 2\, i\cot^{-1}(i z) \;/;\; |z| > 1$$

01.25.27.0660.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) - \frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\cot^{-1}(i z)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.25.27.0661.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2\, i\cot^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1$$

01.25.27.0662.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i + 2\, i\cot^{-1}\left(\frac{i}{z}\right) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \le \pi$$

01.25.27.0663.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) == \pi i + 2 i \cot^{-1}\left(\frac{i}{z}\right) /; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.25.27.0664.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) == 2 i \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi\sqrt{-z^2}}{z} /; |z| > 1$$

01.25.27.0665.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) == -\frac{2 i (1 - i z)}{1 + i z}\sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi\sqrt{-z^2}}{2z}\left(1 - \frac{1 - i z}{1 + i z}\sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\cot^{-1}(i z^r)$

01.25.27.0666.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) == 2 i^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}} \cot^{-1}\left(i z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.25.27.0667.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) == i \cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0668.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) == -i \cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0669.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) == -i \cot^{-1}\left(\sqrt{z}\right) - \pi i /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0670.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) == \frac{\pi i}{2}\left(\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}} - 1\right) - \frac{\sqrt{-1-z}}{\sqrt{1+z}} \cot^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0671.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) == \frac{\pi i}{2} - i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0672.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0673.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\sqrt{-z-1}}{\sqrt{z+1}}\left(\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0674.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0675.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0676.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0677.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -\frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0678.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = \frac{\sqrt{-z-1}}{\sqrt{z+1}}\left(\sqrt{z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.25.27.0679.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = i\cot^{-1}\left(\sqrt{z}\right) /; 0 \leq \arg(z) < \pi \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0680.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -i\cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.0681.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = i\cot^{-1}\left(\sqrt{z}\right) + \pi\, i \;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0682.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \sqrt{-\frac{1}{z+1}}\,\sqrt{z+1}\,\cot^{-1}\left(\sqrt{z}\right) + \frac{\pi\, i}{2}\left(1 - \sqrt{\frac{z}{z+1}}\,\sqrt{\frac{z+1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0683.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \frac{\pi\, i}{2} - i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) \;/;\; \operatorname{Im}(z) \geq 0$$

01.25.27.0684.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -\frac{\pi\, i}{2} + i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) \;/;\; \operatorname{Im}(z) < 0$$

01.25.27.0685.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \sqrt{z}\,\sqrt{-\frac{1}{z}}\left(-\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0686.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \frac{\pi\, i}{2} - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; 0 \leq \arg(z) < \pi$$

01.25.27.0687.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = -\frac{\pi\, i}{2} + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; \operatorname{Im}(z) < 0$$

01.25.27.0688.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \frac{\pi\, i}{2} + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0689.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z}}\right) = \frac{1}{2}\pi\sqrt{z}\,\sqrt{-\frac{1}{z}} - z\sqrt{-\frac{1}{z^2}}\,\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.25.27.0690.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0691.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = \frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0692.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0693.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0694.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}} - \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\cot^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0695.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0696.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0697.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\pi i + i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0698.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1} - 1\right) + \frac{\sqrt{1+z}}{\sqrt{z}}\sqrt{-\frac{z}{z+1}}\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0699.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0700.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0701.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1+z}}\right) = -\pi i - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0702.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1} - 1\right) + \sqrt{\frac{1}{z}}\sqrt{z+1}\sqrt{-\frac{z}{z+1}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.25.27.0703.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{2} - i\cot^{-1}(\sqrt{z}) /; \operatorname{Im}(z) > 0$$

01.25.27.0704.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = -\frac{\pi i}{2} + i\cot^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.25.27.0705.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{2} + i\cot^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0706.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \sqrt{-1-z}\sqrt{\frac{1}{1+z}}\cot^{-1}(\sqrt{z}) + \frac{\pi\sqrt{z}}{2\sqrt{-z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0707.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0708.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = -i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0709.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \pi i - i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0710.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \sqrt{-z-1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0711.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0712.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = -i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0713.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \pi i + i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0714.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{-1-z}}\right) = \sqrt{-z-1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) - \sqrt{z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.25.27.0715.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0716.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\pi i}{2} - i \cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0717.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0718.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\sqrt{-z}}{\sqrt{z}}\cot^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{-z-1}}{2}\sqrt{\frac{1}{z+1}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0719.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0720.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0721.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \pi i - i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0722.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\sqrt{-z}}{\sqrt{z}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1} - 1\right) + \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{-1-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0723.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0724.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0725.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \pi i + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0726.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \frac{\sqrt{-z}}{\sqrt{z}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1} - 1\right) + \sqrt{z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$ and $\cot^{-1}(z)$

01.25.27.0727.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = i\cot^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \wedge i\,z < -1)$$

01.25.27.0728.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \wedge i\,z > 1)$$

01.25.27.0729.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}(z) - \pi\,i /; (i\,z \in \mathbb{R} \wedge -1 < i\,z < 0)$$

01.25.27.0730.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = i\cot^{-1}(z) - \pi\,i /; (i\,z \in \mathbb{R} \wedge 0 < i\,z < 1)$$

01.25.27.0731.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\pi\,i}{2}\left(\frac{\sqrt{-i\,z-1}}{\sqrt{i\,z+1}} + \frac{\sqrt{i\,z-1}}{\sqrt{1-i\,z}}\right) - \frac{\sqrt{z^2}}{z}\cot^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0732.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\pi\,i}{2} - i\cot^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \wedge i\,z < -1)$$

01.25.27.0733.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -\frac{\pi\,i}{2} + i\cot^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0734.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = -\frac{\pi\,i}{2} - i\cot^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0735.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\pi\,i}{2} + i\cot^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \wedge i\,z > 1)$$

01.25.27.0736.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\sqrt{z^2}}{z}\cot^{-1}\left(\frac{1}{z}\right)-\frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$ and $\cot^{-1}(z)$

01.25.27.0737.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) = i\cot^{-1}(z) \;/;\; 0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0738.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -i\cot^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0739.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = i\cot^{-1}(z) + \pi\,i \;/;\; (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0740.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -i\cot^{-1}(z) + \pi\,i \;/;\; (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0741.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \sqrt{-\frac{1}{z^2+1}}\,\sqrt{z^2+1}\left(\frac{\sqrt{z^2}}{z}\cot^{-1}(z) - \frac{\pi\,i}{2}\left(\frac{\sqrt{-i\,z-1}}{\sqrt{i\,z+1}} + \frac{\sqrt{i\,z-1}}{\sqrt{1-i\,z}}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0742.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi\,i}{2} - i\cot^{-1}\left(\frac{1}{z}\right) \;/;\; 0 \le \arg(z) \le \frac{\pi}{2}$$

01.25.27.0743.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -\frac{\pi\,i}{2} + i\cot^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.0744.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -\frac{\pi i}{2} - i\cot^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.0745.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.0746.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \sqrt{-\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{\pi}{2} - \frac{\sqrt{z^2}}{z} \cot^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$ and $\cot^{-1}(z)$

01.25.27.0747.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - i\cot^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.0748.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} + i\cot^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.25.27.0749.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} + i\cot^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.25.27.0750.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} - i\cot^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0751.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{-z^2-1} \cot^{-1}(z) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0752.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0753.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 1)$$

01.25.27.0754.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) - \pi\,i /; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0755.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi\,i /; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0756.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi\,i /; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.0045.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi\,i}{2}\left(\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z} - \sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1}\right) - \sqrt{-z^2-1}\,\sqrt{\frac{1}{z^2+1}}\,\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-1-z^2}}\right)$ and $\cot^{-1}(z)$

01.25.27.0757.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi\,i}{2} - i\cot^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 0)$$

01.25.27.0758.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -\frac{\pi\,i}{2} + i\cot^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0759.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -\frac{\pi\,i}{2} - i\cot^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0760.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} + i\cot^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0761.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{z^2}}{z}\left(\sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\cot^{-1}(z) - \frac{\pi\sqrt{-z^2}}{2z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-1-z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0762.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.0763.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0764.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) + \pi i \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0765.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi i \;/;\; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0766.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(\sqrt{\frac{1}{1-i z}}\sqrt{1-i z} - \sqrt{\frac{1}{i z+1}}\sqrt{i z+1}\right) - \sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\cot^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$ and $\cot^{-1}(z)$

01.25.27.0767.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -\frac{\pi i}{2} + i\cot^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0768.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = \frac{\pi i}{2} - i\cot^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0769.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -\frac{\pi i}{2} - i\cot^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0770.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = \frac{\pi i}{2} + i\cot^{-1}(z) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0771.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}}\cot^{-1}(z) + \frac{\pi\sqrt{-z^2-1}}{2\sqrt{z^2+1}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0772.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0773.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0774.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0775.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1+z^2}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0776.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right) - \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$ and $\cot^{-1}(z)$

01.25.27.0777.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} + i \cot^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.0778.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} - i \cot^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.25.27.0779.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} - i \cot^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0780.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} + i \cot^{-1}(z) \;/;\; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.25.27.0781.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\sqrt{z}}{\sqrt{-z}} \cot^{-1}(z) + \frac{\pi}{2} \sqrt{-z^2-1} \sqrt{\frac{1}{z^2+1}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0782.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -i \cot^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0783.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = i \cot^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0784.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) + \pi\, i\ /;\ (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.25.27.0785.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi\, i\ /;\ (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.25.27.0786.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi\, i}{2}\left(1 - \sqrt{\frac{1}{z^2+1}}\ \sqrt{z^2+1}\right) - \frac{\sqrt{z}}{\sqrt{-z}}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1+z^2}}\ \Big/\left(\sqrt{2}\ (1+z^2)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1+z^2}}\ \Big/\left(\sqrt{2}\ (1+z^2)^{1/4}\right)\right)$ and $\cot^{-1}(z)$

01.25.27.0787.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\ \sqrt[4]{z^2+1}}\right) = \frac{i}{2}\cot^{-1}(z) - \frac{\pi\, i}{4}\ /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.25.27.0788.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\ \sqrt[4]{z^2+1}}\right) = -\frac{i}{2}\cot^{-1}(z) + \frac{\pi\, i}{4}\ /;\ -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.25.27.0789.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\ \sqrt[4]{z^2+1}}\right) = \frac{i}{2}\cot^{-1}(z) + \frac{\pi\, i}{4}\ /;\ \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.25.27.0790.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\ \sqrt[4]{z^2+1}}\right) = -\frac{i}{2}\cot^{-1}(z) - \frac{\pi\, i}{4}\ /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.25.27.0791.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = -\frac{\sqrt{-z^2}\,\cot^{-1}(z)}{2z} + \frac{\pi i}{4}\left(-i\sqrt{\frac{1}{z^2}}\,\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0792.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right)\,/;\,0<\arg(z)\leq\pi$$

01.25.27.0793.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right)\,/;\,-\pi<\arg(z)\leq 0$$

01.25.27.0794.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{\sqrt{-z^2}}{2z}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\cot^{-1}(z)$

01.25.27.0795.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{i}{2}\cot^{-1}(z)\,/;\,0\leq\arg(z)<\frac{\pi}{2}\bigvee(i z\in\mathbb{R}\land i z<-1)$$

01.25.27.0796.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = -\frac{i}{2}\cot^{-1}(z)\;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0797.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{1}{2}\,i\cot^{-1}(z) + \frac{\pi\,i}{2}\;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.0798.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = -\frac{i}{2}\cot^{-1}(z) - \frac{\pi\,i}{2}\;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0799.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{1}{2}\,i\cot^{-1}(z) - \frac{\pi\,i}{2}\;/;\; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.0800.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right) = \frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z}\left(z\sqrt{\frac{1}{z^2}}-1\right) - 2\,i + i\sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1} + i\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\right) + \frac{1}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\,\cot^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{1+z^2}}\Big/\left(\sqrt{2}\,(1+z^2)^{1/4}\right)\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0801.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2+1}}}{\sqrt{2}\,\sqrt[4]{z^2+1}}\right) = \frac{1}{2}\,i\cot^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4}\;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.0802.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right)=-\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}\;/;\;\text{Im}(z)\geq 0$$

01.25.27.0803.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right)=-\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right)-\frac{3\pi i}{4}\;/;\;(i z\in\mathbb{R}\land i z>1)$$

01.25.27.0804.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{1+z^2}}}{\sqrt{2}\,(1+z^2)^{1/4}}\right)=\frac{\pi}{4}\left(-i+i\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}+\sqrt{-\frac{1}{z}}\sqrt{z}\right)-\frac{1}{2}\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\sqrt{-\frac{1}{z}}\sqrt{z}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}(z)$

01.25.27.0805.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right)=\frac{i}{2}\cot^{-1}(z)-\frac{\pi i}{4}\;/;\;0<\arg(z)<\frac{\pi}{2}\bigvee(i z\in\mathbb{R}\land i z<-1)$$

01.25.27.0806.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right)=-\frac{i}{2}\cot^{-1}(z)+\frac{\pi i}{4}\;/;\;-\frac{\pi}{2}<\arg(z)\leq 0\bigvee(i z\in\mathbb{R}\land 0<i z<1)$$

01.25.27.0807.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right)=\frac{i}{2}\cot^{-1}(z)+\frac{\pi i}{4}\;/;\;\frac{\pi}{2}<\arg(z)\leq\pi\bigvee(i z\in\mathbb{R}\land -1<i z<0)$$

01.25.27.0808.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right)=-\frac{i}{2}\cot^{-1}(z)-\frac{\pi i}{4}\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(i z\in\mathbb{R}\land i z>1)$$

01.25.27.0809.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = -\frac{\sqrt{-z^2}\,\cot^{-1}(z)}{2z} + \frac{\pi i}{4}\left(-i\sqrt{\frac{1}{z^2}}\,\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0810.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{1}{2}\,i\cot^{-1}\left(\frac{1}{z}\right)\;/;\;0 < \arg(z) \leq \pi$$

01.25.27.0811.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{1}{2}\,i\cot^{-1}\left(\frac{1}{z}\right)\;/;\;-\pi < \arg(z) \leq 0$$

01.25.27.0812.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{\sqrt{-z^2}}{2z}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{1+z^2}\right)/\left(2\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}(z)$

01.25.27.0813.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{i}{2}\cot^{-1}(z)\;/;\;0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0814.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{i}{2}\cot^{-1}(z)\;/;\;-\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0815.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = \frac{1}{2}\,i\cot^{-1}(z) + \frac{\pi i}{2}\;/;\;\frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.0816.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{i}{2}\cot^{-1}(z) - \frac{\pi i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0817.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) = -\frac{i}{2}\cot^{-1}(z) + \frac{\pi i}{2} /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0818.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2+1}}{2\sqrt{z^2+1}}}\right) =$$
$$\frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z}\left(z\sqrt{\frac{1}{z^2}}-1\right) + i\sqrt{\frac{1}{i z+1}}\sqrt{i z+1} - i\sqrt{1-i z}\sqrt{\frac{1}{1-i z}}\right) + \frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\cot^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{1+z^2}\right)\Big/\left(2\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.25.27.0819.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{1}{2} i \cot^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.0820.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) \geq 0$$

01.25.27.0821.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right) + \frac{3\pi i}{4} /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0822.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{1+z^2}}{2\sqrt{1+z^2}}}\right) = \frac{\pi}{4}\left(2 i - 2 i\sqrt{\frac{1}{1-i z}}\sqrt{1-i z} + \sqrt{-\frac{1}{z}}\sqrt{z}\right) - \frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{i}{z}\right)$

01.25.27.0823.01

$$\sinh^{-1}(z) = i \csc^{-1}\left(\frac{i}{z}\right)$$

Involving $\sinh^{-1}(i z)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0824.01

$$\sinh^{-1}(i z) = i \csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{1}{1+2 z^2}\right)$

01.25.27.0825.01

$$\sinh^{-1}(z) = \frac{i}{2}\left(\frac{\pi}{2} - \csc^{-1}\left(\frac{1}{2 z^2 + 1}\right)\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0826.01

$$\sinh^{-1}(z) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{2 z^2 + 1}\right) - \frac{\pi}{2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0827.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{2 z}\left(\csc^{-1}\left(\frac{1}{2 z^2 + 1}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+i z}}\right)$

01.25.27.0828.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 + i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\sqrt{\frac{2}{1+i z}}\right)$

01.25.27.0829.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \csc^{-1}\left(\sqrt{\frac{2}{1 + i z}}\right) /; i z \notin (-\infty, -1)$$

01.25.27.0830.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \csc^{-1}\left(\sqrt{\frac{2}{1 + i z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0831.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \sqrt{1 + i z} \sqrt{\frac{1}{1 + i z}} \csc^{-1}\left(\sqrt{\frac{2}{1 + i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-i z}}\right)$

01.25.27.0832.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\sqrt{\frac{2}{1-i z}}\right)$

01.25.27.0833.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \csc^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) /; i z \notin (1, \infty)$$

01.25.27.0834.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \csc^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.0835.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \sqrt{1 - i z} \sqrt{\frac{1}{1 - i z}} \csc^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$

01.25.27.0836.01

$$\sinh^{-1}(z) = i \csc^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0837.01

$$\sinh^{-1}(z) = -i \csc^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0838.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{z} \csc^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$

01.25.27.0839.01

$$\sinh^{-1}(z) = i \csc^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; 0 \leq \arg(z) < \pi$$

01.25.27.0840.01

$$\sinh^{-1}(z) = -i \csc^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; -\pi < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.25.27.0841.01

$$\sinh^{-1}(z) = z \sqrt{-\frac{1}{z^2}} \csc^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$

01.25.27.0842.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0843.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0844.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\csc^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\csc^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right)$

01.25.27.0845.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^4}}{2z^2} \csc^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) /; |\arg(z)| \leq \frac{\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{3\pi}{4}$$

01.25.27.0846.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-i z}\sqrt{\frac{1}{1-i\sqrt{2}\, z}}\sqrt{1-i\sqrt{2}\, z} + i\sqrt{-\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{\sqrt{2}\, i z+1}}\sqrt{\sqrt{2}\, i z+1} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{\sqrt{-2z^2-1}}{2z^2\sqrt{2z^2+1}}\sqrt{-\frac{z^2}{-z^2-1}}\sqrt{-z^2\left(-z^2-1\right)} \csc^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.25.27.0847.01

$$\sinh^{-1}\left(\sqrt{z}\right) = i\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)\ /;\ 0 < \arg(z) \leq \pi$$

01.25.27.0848.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -i\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)\ /;\ -\pi < \arg(z) \leq 0$$

01.25.27.0849.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -\frac{\sqrt{-z^2}}{z}\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$ and $\csc^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.0850.01

$$\sinh^{-1}\left(\sqrt{z}\right) = i\csc^{-1}\left(\sqrt{-\frac{1}{z}}\right)\ /;\ \mathrm{Im}(z) \geq 0$$

01.25.27.0851.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -i\csc^{-1}\left(\sqrt{-\frac{1}{z}}\right)\ /;\ \mathrm{Im}(z) < 0$$

01.25.27.0852.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \sqrt{-\frac{1}{z}}\sqrt{z}\csc^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\sqrt{-z}\right)$

01.25.27.0853.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i\csc^{-1}\left(\sqrt{-z}\right)\ /;\ 0 < \arg(z) \leq \pi$$

01.25.27.0854.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i\csc^{-1}\left(\sqrt{-z}\right)\ /;\ -\pi < \arg(z) \leq 0$$

01.25.27.0855.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{z}\csc^{-1}\left(\sqrt{-z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{c\,z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\csc^{-1}\left(\frac{i}{z}\right)$

01.25.27.0856.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = i\csc^{-1}\left(\frac{i}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0857.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -i\csc^{-1}\left(\frac{i}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0858.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \frac{i\sqrt{z^2}}{z}\csc^{-1}\left(\frac{i}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-z^2}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0859.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = -i\csc^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0860.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = i\csc^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0861.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \frac{\sqrt{-z^2}}{z}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\sinh^{-1}(a\,(b\,z^c)^m)$ and $\csc^{-1}\left(\frac{i}{a}\,b^{-m}\,z^{-m\,c}\right)$

01.25.27.0862.01

$$\sinh^{-1}(a\,(b\,z^c)^m) = \frac{i\,(b\,z^c)^m}{b^m\,z^{m\,c}}\csc^{-1}\left(\frac{i}{a}\,b^{-m}\,z^{-m\,c}\right) /; 2\,m \in \mathbb{Z}$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0863.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0864.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0865.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{-(z-1)^2}}{z-1} \left(\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0866.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0867.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0868.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0869.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \frac{\pi}{2}\left(-i + i \sqrt{\frac{1}{1-z}} \sqrt{1-z} + \sqrt{-\frac{1}{z}} \sqrt{z}\right) + \frac{\sqrt{z} \sqrt{-(z-1)^2}}{z-1} \sqrt{\frac{1}{z}} \csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1+c z}}{\sqrt{2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0870.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = -\frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right) \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0871.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0872.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = -\frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0873.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0874.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = -\frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0875.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\sqrt{z}\right)$

01.25.27.0876.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0877.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0878.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0879.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z}}\,\sqrt{z}\,\csc^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\csc^{-1}\left(\sqrt{z}\right)$

01.25.27.0880.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.0881.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0882.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0883.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \sqrt{\frac{1}{z}} \sqrt{-z} \csc^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{z}}{2\sqrt{-z}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\csc^{-1}\left(\sqrt{z}\right)$

01.25.27.0884.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0885.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0886.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0887.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \csc^{-1}\left(\sqrt{z}\right)\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{1}{z}} \sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right)$ and $\csc^{-1}(z)$

01.25.27.0888.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{i}{2}\csc^{-1}(z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0889.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0890.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\sqrt{-z}}{2\sqrt{z}}\csc^{-1}(z) + \frac{\pi\sqrt{-z^2}}{4z}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\csc^{-1}(z)$

01.25.27.0891.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2} i\csc^{-1}(z) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0892.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i\csc^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0893.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(\frac{\pi}{2} - \csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\csc^{-1}(z)$

01.25.27.0894.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.0895.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{i}{2}\csc^{-1}(z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.0896.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{\sqrt{-z-1}}{2\sqrt{z+1}}\left(\csc^{-1}(z) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\csc^{-1}(z)$

01.25.27.0897.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \csc^{-1}(z) \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0898.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2} i \csc^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0899.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{\sqrt{z}}{2\sqrt{-z}}\left(\frac{\pi}{2} - \csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right)$ and $\csc^{-1}(z)$

01.25.27.0900.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0901.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{i}{2}\csc^{-1}(z) - \frac{\pi i}{4} \;/;\; \mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0902.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2\sqrt{\frac{z+1}{z}}}\sqrt{-\frac{z+1}{z}}\left(\csc^{-1}(z) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\csc^{-1}(z)$

01.25.27.0903.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2} i \csc^{-1}(z) - \frac{\pi i}{4} \;/;\; \mathrm{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0904.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = -\frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; \mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0905.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2\,z}}\right) = \frac{1}{2\sqrt{\frac{z-1}{z}}}\sqrt{\frac{1-z}{z}}\left(\frac{\pi}{2}-\csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{a\,z^c-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{a\,z^c-1}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0906.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{i\,\pi}{2} - i\csc^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0907.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -\frac{i\,\pi}{2} + i\csc^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0908.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -\frac{i\,\pi}{2} - i\csc^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0909.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{i\,\pi}{2} + i\csc^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0910.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\csc^{-1}(z)$

01.25.27.0911.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\frac{\pi\,i}{2} + i\csc^{-1}(z) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0912.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi\,i}{2} - i\csc^{-1}(z) /;\ -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0913.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\frac{\pi i}{2} - i\csc^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0914.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2} + i\csc^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0915.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{\frac{1}{z^2}}\sqrt{-z^2}\csc^{-1}(z) /; z \notin (-1, 1)$$

01.25.27.0046.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\sqrt{z^2}\sqrt{1-z^2}}{z\sqrt{z^2-1}}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z\csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\csc^{-1}(z)$

01.25.27.0916.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + i\csc^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0917.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - i\csc^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0918.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + i\csc^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0919.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - i\csc^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0920.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z\csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\csc^{-1}(z)$

01.25.27.0921.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - i \csc^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0922.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + i \csc^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.0923.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - i \csc^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.0924.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + i \csc^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.0925.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2}}{\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}}\; z \csc^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\csc^{-1}(z)$

01.25.27.0926.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} + i \csc^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0927.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} - i \csc^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.0928.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} + i\csc^{-1}(z) \;/;\; \frac{\pi}{2} \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.0929.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} - i\csc^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0930.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{1}{\sqrt{1-\frac{1}{z^2}}}\sqrt{\frac{1}{z^2}-1}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z\csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0931.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{2z^2}{\sqrt{-z^4}}\csc^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{4} \le |\arg(z)| \le \frac{3\pi}{4}$$

01.25.27.0932.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}\,z+1}}\sqrt{\sqrt{2}\,z+1} + \sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}\,z}}\sqrt{1-\sqrt{2}\,z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right) - \frac{2\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$ and $\csc^{-1}(z)$

01.25.27.0933.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\csc^{-1}(z) /; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.0934.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2}$$
$$\left(\pi\left(\frac{\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}z^3}{1-z^2}+\sqrt{\frac{1}{z^2}}z-\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}\right)-\right.$$
$$\left.4\csc^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0935.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = -\frac{i}{2}\csc^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0936.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{i}{2}\csc^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0937.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\sqrt{-z^2}}{2z}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\middle/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\middle/\sqrt{2z^2}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0938.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = -\frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right)\text{ /; } 0<\arg(z)\leq\frac{\pi}{2}\bigvee -\pi<\arg(z)\leq-\frac{\pi}{2}$$

01.25.27.0939.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right)\text{ /; } \frac{\pi}{2}<\arg(z)\leq\pi\bigvee -\frac{\pi}{2}<\arg(z)\leq 0$$

01.25.27.0940.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\sqrt{-z^4}}{2z^2}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\middle/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\middle/\left(2z^2\right)}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.25.27.0941.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = -\frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right)\text{ /; } 0<\arg(z)<\frac{\pi}{2}\bigvee -\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.0942.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = \frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right)\text{ /; } \frac{\pi}{2}\leq\arg(z)\leq\pi\bigvee -\frac{\pi}{2}\leq\arg(z)\leq 0$$

01.25.27.0943.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) == \frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z}\Big/\sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z}\Big/\sqrt{2z}\right)$ and $\csc^{-1}(z)$

01.25.27.0944.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) == \frac{1}{2}i\csc^{-1}(z)\;/;\;0 \le \arg(z) \le \frac{\pi}{2}$$

01.25.27.0945.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) == -\frac{i}{2}\csc^{-1}(z)\;/;\;-\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.0946.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) == -\frac{\pi i}{2} - \frac{1}{2}i\csc^{-1}(z)\;/;\;\frac{\pi}{2} < \arg(z) \le \pi$$

01.25.27.0947.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) == \frac{\pi i}{2} + \frac{1}{2}i\csc^{-1}(z)\;/;\;-\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.0948.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) == \frac{\pi i}{2} - \frac{1}{2}i\csc^{-1}(z)\;/;\;(i z \in \mathbb{R} \land i z > 0)$$

01.25.27.0949.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1-\frac{i\sqrt{-i\,z}}{\sqrt{i\,z}}\right)-\frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{i\,z}\sqrt{z}\csc^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$ and $\csc^{-1}(z)$

01.25.27.0950.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{1}{2}i\csc^{-1}(z)\;/;\;0\leq\arg(z)\leq\frac{\pi}{2}$$

01.25.27.0951.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{i}{2}\csc^{-1}(z)\;/;\;-\frac{\pi}{2}<\arg(z)<0$$

01.25.27.0952.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi\,i}{2}+\frac{1}{2}i\csc^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee(z\in\mathbb{R}\wedge z<-1)$$

01.25.27.0953.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{\pi\,i}{2}-\frac{1}{2}i\csc^{-1}(z)\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\wedge -1<z<0)$$

01.25.27.0954.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi\,i}{2}-\frac{1}{2}i\csc^{-1}(z)\;/;\;(i\,z\in\mathbb{R}\wedge i\,z>0)$$

01.25.27.0955.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi}{4}\left(\sqrt{-\frac{1}{z^2}}\, z - \frac{2\sqrt{i z}\sqrt{z^2}}{z}\sqrt{\frac{i}{z}} - \sqrt{-\frac{1}{z^2}}\sqrt{z^2} + 4 i - 2 i \sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\sqrt{-\frac{1}{z^2}}\, z \csc^{-1}(z)$$

Involving $\sec^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{i}{z}\right)$

01.25.27.0956.01

$$\sinh^{-1}(z) = -i \sec^{-1}\left(\frac{i}{z}\right) + \frac{i\pi}{2}$$

Involving $\sinh^{-1}(i z)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.0957.01

$$\sinh^{-1}(i z) = -i \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{1}{1+2z^2}\right)$

01.25.27.0958.01

$$\sinh^{-1}(z) = \frac{i}{2}\sec^{-1}\left(\frac{1}{1+2z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0959.01

$$\sinh^{-1}(z) = -\frac{i}{2}\sec^{-1}\left(\frac{1}{1+2z^2}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0960.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{2z}\sec^{-1}\left(\frac{1}{1+2z^2}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+i z}}\right)$

01.25.27.0961.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \sec^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2}{1+i z}}\right)$

01.25.27.0962.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 i \sec^{-1}\left(\sqrt{\frac{2}{1+i z}}\right) /; i z \notin (-\infty, -1)$$

01.25.27.0963.01

$$\sinh^{-1}(z) = -2 i \sec^{-1}\left(\sqrt{\frac{2}{1+i z}}\right) + \frac{3 \pi i}{2} /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.0964.01

$$\sinh^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) + 2 i \sqrt{\frac{1}{i z + 1}} \sqrt{i z + 1} \sec^{-1}\left(\sqrt{\frac{2}{i z + 1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-i z}}\right)$

01.25.27.0965.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \sec^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2}{1-i z}}\right)$

01.25.27.0966.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 i \sec^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) /; i z \notin (1, \infty)$$

01.25.27.0967.01

$$\sinh^{-1}(z) = 2 i \sec^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) - \frac{3 \pi i}{2} /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.0968.01

$$\sinh^{-1}(z) = \pi i \left(\sqrt{1 - i z} \sqrt{\frac{1}{1 - i z}} - \frac{1}{2}\right) - 2 i \sqrt{1 - i z} \sqrt{\frac{1}{1 - i z}} \sec^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$

01.25.27.0969.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; 0 < \arg(z) \le \pi$$

01.25.27.0970.01

$$\sinh^{-1}(z) = i \sec^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.25.27.0971.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(\sec^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$

01.25.27.0972.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; 0 \leq \arg(z) < \pi$$

01.25.27.0973.01

$$\sinh^{-1}(z) = i \sec^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.0974.01

$$\sinh^{-1}(z) = \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} - z \sqrt{-\frac{1}{z^2}} \sec^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$

01.25.27.0975.01

$$\sinh^{-1}(z) = i \sec^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0976.01

$$\sinh^{-1}(z) = -i \sec^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.0977.01

$$\sinh^{-1}(z) = -\frac{\sqrt{-z^2}}{z} \sec^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\sec^{-1}\left(\frac{1}{2 z \sqrt{-z^2-1}}\right)$

01.25.27.0978.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^4}}{2z^2}\left(\sec^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right)-\frac{\pi}{2}\right) /; |\arg(z)| \leq \frac{\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{3\pi}{4}$$

01.25.27.0979.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{1}{1-i\sqrt{2}\,z}}\sqrt{1-i\sqrt{2}\,z} + i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}\,iz+1}}\sqrt{\sqrt{2}\,iz+1} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{\sqrt{-2z^2-1}}{2z^2\sqrt{2z^2+1}}\sqrt{-\frac{z^2}{-z^2-1}}\sqrt{-z^2(-z^2-1)}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right)\right)$$

Involving $\sinh^{-1}(\sqrt{z})$

Involving $\sinh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.25.27.0980.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i\sec^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.0981.01

$$\sinh^{-1}(\sqrt{z}) = i\sec^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.25.27.0982.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{z}\left(\sec^{-1}\left(\frac{1}{\sqrt{-z}}\right)-\frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.0983.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i\sec^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.25.27.0984.01

$$\sinh^{-1}(\sqrt{z}) = i\sec^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.25.27.0985.01

$$\sinh^{-1}(\sqrt{z}) = \sqrt{z}\sqrt{-\frac{1}{z}}\left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{-\frac{1}{z}}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{-z}\right)$

01.25.27.0986.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\sqrt{-z}\right) - \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0987.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{-z}\right) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0988.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{z} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{-z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{c z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\sec^{-1}\left(\frac{i}{z}\right)$

01.25.27.0989.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -i \sec^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.0990.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = i \sec^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0991.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \frac{i \sqrt{z^2}}{z} \left(-\sec^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-z^2}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.0992.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.0993.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = -i \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.0994.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\sinh^{-1}(a\,(b\,z^c)^m)$ and $\sec^{-1}\left(\frac{i}{a}\,b^{-m}\,z^{-m\,c}\right)$

01.25.27.0995.01

$$\sinh^{-1}(a\,(b\,z^c)^m) = \frac{i\,(b\,z^c)^m}{b^m\,z^{m\,c}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{i}{a}\,b^{-m}\,z^{-m\,c}\right)\right) /;\ 2\,m \in \mathbb{Z}$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.0996.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i\sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0997.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -i\sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0998.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -\frac{\sqrt{-(z-1)^2}}{z-1}\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.0999.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = i\sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1000.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -i\sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1001.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \pi\,i - i\sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ (z \in \mathbb{R} \land z < 0)$$

01.25.27.1002.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi i}{2}\left(\sqrt{z}\sqrt{\frac{1}{z}}-1\right) - \frac{\sqrt{z}\sqrt{-(z-1)^2}}{z-1}\sqrt{\frac{1}{z}}\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1+c z}}{\sqrt{2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.1003.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} i\left(\sec^{-1}\left(\frac{1}{z}\right)-\pi\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1004.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} i\left(\pi - \sec^{-1}\left(\frac{1}{z}\right)\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.1005.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\sec^{-1}\left(\frac{1}{z}\right)-\pi\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right)$ and $\cos^{-1}(z)$

01.25.27.1006.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = -\frac{i}{2}\cos^{-1}(z) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1007.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{i}{2}\cos^{-1}(z) /; 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1008.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = -\frac{\sqrt{1-z}}{2\sqrt{z-1}}\cos^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{z}\right)$

01.25.27.1009.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -i\sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1010.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i \sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1011.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = i \left(\sec^{-1}\left(\sqrt{z}\right) - \pi\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1012.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \left(\frac{\pi}{2} - \sqrt{\frac{1}{z}} \sqrt{z} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{z}\right)\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\sec^{-1}\left(\sqrt{z}\right)$

01.25.27.1013.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i \sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.1014.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -i \sec^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.1015.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = i \left(\pi - \sec^{-1}\left(\sqrt{z}\right)\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1016.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} - 1\right) - \sqrt{-z} \sqrt{\frac{1}{z}} \sec^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\sec^{-1}\left(\sqrt{z}\right)$

01.25.27.1017.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -i \sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1018.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i \sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1019.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = i \left(\pi - \sec^{-1}\left(\sqrt{z}\right)\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1020.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \sec^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{1}{z}} \sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right)$ and $\sec^{-1}(z)$

01.25.27.1021.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{i}{2} \sec^{-1}(z) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.25.27.1022.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{i}{2} \sec^{-1}(z) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.25.27.1023.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\pi \sqrt{-z^2}}{2z} - \frac{\sqrt{-z}}{2\sqrt{z}} \sec^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\sec^{-1}(z)$

01.25.27.1024.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2} i \sec^{-1}(z) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1025.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2} i \sec^{-1}(z) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.0047.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}} \sec^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\sec^{-1}(z)$

01.25.27.1026.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{i}{2}\sec^{-1}(z) + \frac{\pi i}{2} \;/;\; \mathrm{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1027.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{i}{2}\sec^{-1}(z) - \frac{\pi i}{2} \;/;\; \mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.25.27.1028.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}}\left(\sec^{-1}(z) - \pi\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\sec^{-1}(z)$

01.25.27.1029.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{1}{2} i \sec^{-1}(z) \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.1030.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{1}{2} i \sec^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.1031.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{\sqrt{z}}{2\sqrt{-z}} \sec^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right)$ and $\sec^{-1}(z)$

01.25.27.1032.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{i}{2}\sec^{-1}(z) + \frac{\pi i}{2} \;/;\; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1033.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{i}{2}\sec^{-1}(z) - \frac{\pi i}{2} \;/;\; \mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1034.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2\,z}}\right) = \frac{1}{2\sqrt{\frac{z+1}{z}}}\sqrt{-\frac{z+1}{z}}\left(-\sec^{-1}(z)+\pi\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2\,z}}\right)$ and $\sec^{-1}(z)$

01.25.27.1035.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2\,z}}\right) = -\frac{1}{2}\,i\sec^{-1}(z)\;/;\;\operatorname{Im}(z)>0\lor(z\in\mathbb{R}\land 0<z<1)$$

01.25.27.1036.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2\,z}}\right) = \frac{1}{2}\,i\sec^{-1}(z)\;/;\;\operatorname{Im}(z)<0\lor(z\in\mathbb{R}\land z<0)\lor(z\in\mathbb{R}\land z>1)$$

01.25.27.1037.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2\,z}}\right) = \frac{1}{2\sqrt{\frac{z-1}{z}}}\sqrt{\frac{1-z}{z}}\sec^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{a\,z^c-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{a\,z^c-1}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.1038.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = i\sec^{-1}\left(\frac{1}{z}\right)\;/;\;0<\arg(z)\le\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.25.27.1039.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -i\sec^{-1}\left(\frac{1}{z}\right)\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.25.27.1040.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -i\,\pi+i\sec^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee(z\in\mathbb{R}\land z<-1)$$

01.25.27.1041.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = i\,\pi-i\sec^{-1}\left(\frac{1}{z}\right)\;/;\;-\pi<\arg(z)\le-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land -1<z<0)$$

01.25.27.1042.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)-\frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\sec^{-1}(z)$

01.25.27.1043.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -i\sec^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1044.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = i\sec^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1045.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\pi i + i\sec^{-1}(z) \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1046.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \pi i - i\sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1047.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{\frac{1}{z^2}}\sqrt{-z^2}\left(\frac{\pi}{2} - \sec^{-1}(z)\right) \;/;\; z \notin (-1, 1)$$

01.25.27.1048.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\sqrt{z^2}\sqrt{1-z^2}}{z\sqrt{z^2-1}}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z\left(\frac{\pi}{2} - \sec^{-1}(z)\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\sec^{-1}(z)$

01.25.27.1049.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -i\sec^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.1050.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = i \sec^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1051.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \pi i - i \sec^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1052.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\pi i + i \sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.1053.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z \left(\frac{\pi}{2} - \sec^{-1}(z)\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\sec^{-1}(z)$

01.25.27.1054.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = i \sec^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.1055.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -i \sec^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \le 0$$

01.25.27.1056.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\pi i + i \sec^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi$$

01.25.27.1057.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \pi i - i \sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.1058.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2}}{\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z \left(\frac{\pi}{2} - \sec^{-1}(z)\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\sec^{-1}(z)$

01.25.27.1059.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -i\sec^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1060.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = i\sec^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1061.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \pi i - i\sec^{-1}(z) \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1062.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\pi i + i\sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1063.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{1}{\sqrt{1-\frac{1}{z^2}}}\sqrt{\frac{1}{z^2}-1}\left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2}}\, z\left(\frac{\pi}{2} - \sec^{-1}(z)\right)\right)$$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.1064.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{2z^2}{\sqrt{-z^4}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right) \;/;\; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.1065.01

$$\sinh^{-1}\left(2\,z\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-2\,z^2}\,\sqrt{z^4-z^2}}{2\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2\,z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{\sqrt{2}\,z+1}}\,\sqrt{\sqrt{2}\,z+1} + \sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{1}{1-\sqrt{2}\,z}}\,\sqrt{1-\sqrt{2}\,z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right) - \frac{2\sqrt{1-2\,z^2}\,\sqrt{z^4-z^2}}{\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2\,z^2-1}}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$ and $\sec^{-1}(z)$

01.25.27.1066.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = -\frac{2\,z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\left(\frac{\pi}{2}-\sec^{-1}(z)\right) /;\ |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.1067.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\,\sqrt{-z^4+3\,z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\,\sqrt{z^2-2} \left(\pi\left(\frac{\sqrt{\frac{1-z^2}{z^2}}\,\sqrt{\frac{1-z^2}{z^4}}\,z^3}{1-z^2} + \sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{z}}\,\sqrt{\frac{z}{z+\sqrt{2}}}\,\sqrt{\frac{z+\sqrt{2}}{z}}\,\sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}}\,\sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{z}{z-\sqrt{2}}} - 2\right) + 4\sec^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.1068.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.1069.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\pi i}{4} - \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.1070.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\big/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\big/\sqrt{2z^2}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.1071.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1072.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.25.27.1073.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)/(2z^2)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)/(2z^2)}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.25.27.1074.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}i\sec^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4}\;/;\;0<\arg(z)<\frac{\pi}{2}\bigvee-\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.1075.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{\pi i}{4}-\frac{1}{2}i\sec^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2}\leq\arg(z)\leq\pi\bigvee-\frac{\pi}{2}\leq\arg(z)\leq 0$$

01.25.27.1076.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z}\,/\sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z}\,/\sqrt{2z}\right)$ and $\sec^{-1}(z)$

01.25.27.1077.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right)=\frac{\pi i}{4}-\frac{1}{2}i\sec^{-1}(z)\;/;\;0\leq\arg(z)\leq\frac{\pi}{2}$$

01.25.27.1078.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right)=\frac{i}{2}\sec^{-1}(z)-\frac{\pi i}{4}\;/;\;-\frac{\pi}{2}<\arg(z)<0$$

01.25.27.1079.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.25.27.1080.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1081.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) /; (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.1082.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi}{z\,4} \sqrt{-z^2} \left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2} \sqrt{-\frac{1}{z}} \sqrt{\frac{i}{z}} \sqrt{i z} \sqrt{z} \left(\frac{\pi}{2} - \sec^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$ and $\sec^{-1}(z)$

01.25.27.1083.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1084.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{i}{2} \sec^{-1}(z) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1085.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1086.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) \,/;\, -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1087.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) \,/;\, (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.1088.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) =$$

$$\frac{\pi}{4}\left(z\sqrt{-z^{-2}}\sqrt{z+1}\sqrt{\frac{1}{z+1}} + \sqrt{-\frac{1}{z^2}}\,z - \frac{2\sqrt{i z}\sqrt{z^2}}{z}\sqrt{\frac{i}{z}} - \sqrt{-\frac{1}{z^2}}\sqrt{z^2} + 4i - 2i\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) -$$

$$\frac{1}{2}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\sqrt{-\frac{1}{z^2}}\,z \sec^{-1}(z)$$

Involving $\cosh^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}(i z)$

01.25.27.0048.02

$$\sinh^{-1}(z) = \cosh^{-1}(i z) - \frac{\pi i}{2} \,/;\, -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \bigvee 0 < i z < 1$$

01.25.27.0049.02

$$\sinh^{-1}(z) = -\cosh^{-1}(i z) - \frac{\pi i}{2} \,/;\, \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee i z > 1$$

01.25.27.0050.01

$$\sinh^{-1}(z) = i\left(\frac{\sqrt{1-i z}}{\sqrt{i z - 1}} \cosh^{-1}(i z) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}(-i z)$

01.25.27.1089.01

$$\sinh^{-1}(z) = \cosh^{-1}(-i z) + \frac{\pi i}{2} \,/;\, -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1090.01

$$\sinh^{-1}(z) = -\cosh^{-1}(-i z) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1091.01

$$\sinh^{-1}(z) = -\frac{i \sqrt{i z + 1}}{\sqrt{-i z - 1}} \cosh^{-1}(-i z) + \frac{\pi i}{2}$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}(1 + 2 z^2)$

01.25.27.1092.01

$$\sinh^{-1}(z) = \frac{1}{2} \cosh^{-1}(2 z^2 + 1) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1093.01

$$\sinh^{-1}(z) = -\frac{1}{2} \cosh^{-1}(2 z^2 + 1) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.0051.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}}{2 z} \cosh^{-1}(2 z^2 + 1)$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{1+i z}{2}}\right)$

01.25.27.1094.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 \cosh^{-1}\left(\sqrt{\frac{1 + i z}{2}}\right) \;/;\; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1095.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 \cosh^{-1}\left(\sqrt{\frac{1}{2} (i z + 1)}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1096.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \sqrt{\frac{1}{1 - i z}} \sqrt{\frac{i}{z}} \sqrt{z (i + z)} \cosh^{-1}\left(\sqrt{\frac{1}{2} (i z + 1)}\right)$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{1-i z}{2}}\right)$

01.25.27.1097.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 \cosh^{-1}\left(\sqrt{\frac{1 - i z}{2}}\right) \;/;\; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1098.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2 \cosh^{-1}\left(\sqrt{\frac{1 - i z}{2}}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1099.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \sqrt{\frac{1}{i z + 1}} \sqrt{-\frac{i}{z}} \sqrt{z(-i + z)} \cosh^{-1}\left(\sqrt{\frac{1}{2}(1 - i z)}\right)$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{-z^2}\right)$

01.25.27.1100.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1101.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-z^2}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1102.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-z^2}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1103.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-z^2}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1104.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(\frac{\sqrt{1 - \sqrt{-z^2}}}{\sqrt{\sqrt{-z^2} - 1}} \cosh^{-1}\left(\sqrt{-z^2}\right) - \frac{\pi}{2} \right)$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{1 + z^2}\right)$

01.25.27.1105.01

$$\sinh^{-1}(z) = \cosh^{-1}\left(\sqrt{z^2 + 1}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1106.01

$$\sinh^{-1}(z) = -\cosh^{-1}\left(\sqrt{z^2 + 1}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1107.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}}{z} \cosh^{-1}\left(\sqrt{z^2 + 1}\right)$$

Involving $\sinh^{-1}(z)$ and $\cosh^{-1}\left(2 i z \sqrt{1 + z^2}\right)$

01.25.27.1108.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2} \cosh^{-1}\left(2 i z \sqrt{z^2 + 1}\right) /; \frac{3\pi}{4} \leq |\arg(z)| \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1109.01

$$\sinh^{-1}(z) = \frac{1}{4}\pi\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{1-i\sqrt{2}\,z}\sqrt{\frac{1}{1-i\sqrt{2}\,z}} + i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}\,iz+1}}\sqrt{\sqrt{2}\,iz+1} + \frac{i\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}}{\sqrt{2z^2+1}\sqrt{z^4+z^2}} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{i\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}\sqrt{1-2iz\sqrt{z^2+1}}}{2\sqrt{2z^2+1}\sqrt{z^4+z^2}\sqrt{2iz\sqrt{z^2+1}-1}}\cosh^{-1}\left(2iz\sqrt{z^2+1}\right)$$

Involving $\sinh^{-1}(\sqrt{z})$

Involving $\sinh^{-1}(\sqrt{z})$ and $\cosh^{-1}(\sqrt{-z})$

01.25.27.1110.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \cosh^{-1}(\sqrt{-z}) \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1111.01

$$\sinh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \cosh^{-1}(\sqrt{-z}) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.1112.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - \cosh^{-1}(\sqrt{-z}) \;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1113.01

$$\sinh^{-1}(\sqrt{z}) = \sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}}\cosh^{-1}(\sqrt{-z}) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.25.27.1114.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1115.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.1116.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1117.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi \sqrt{-z^2}}{2 z}$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.1118.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; 0 \le \arg(z) < \pi \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1119.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1120.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1121.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{1}{2} \pi \sqrt{z} \sqrt{-\frac{1}{z}}$$

Involving $\sinh^{-1}\left(\sqrt{c z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\cosh^{-1}(i z)$

01.25.27.1122.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \cosh^{-1}(i z) - \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.25.27.1123.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \cosh^{-1}(i z) + \frac{\pi i}{2} /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1124.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -\cosh^{-1}(i z) + \frac{\pi i}{2} /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1125.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \sqrt{\frac{z+i}{z}} \sqrt{\frac{z}{z+i}} \cosh^{-1}(i z) - \frac{\pi i \sqrt{z^2}}{2 z}$$

Involving $\sinh^{-1}\left(\sqrt{-z^2}\right)$ and $\cosh^{-1}(z)$

01.25.27.1126.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \cosh^{-1}(z) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.25.27.1127.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \cosh^{-1}(z) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1128.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = -\cosh^{-1}(z) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1129.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \cosh^{-1}(z) + \frac{\pi \sqrt{-z^2}}{2 z}$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\cosh^{-1}\left(\sqrt{z}\right)$

01.25.27.0052.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \cosh^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1+c z}}{\sqrt{2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right)$ and $\cosh^{-1}(z)$

01.25.27.1130.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} \cosh^{-1}(z) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1131.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1132.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = -\frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land -1 < z < 1)$$

01.25.27.1133.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2}}\right) = \frac{\sqrt{z+1} \sqrt{1-z}}{2 \sqrt{-z-1} \sqrt{z-1}} \cosh^{-1}(z) - \frac{\pi \sqrt{z+1}}{2 \sqrt{-z-1}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right)$ and $\cosh^{-1}(z)$

01.25.27.0053.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{1}{2}\cosh^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1134.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |\arg(z)| < \pi$$

01.25.27.1135.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1136.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2}\left(\sqrt{z}\sqrt{\frac{1}{z}} - 1\right) + \sqrt{\frac{1}{z}}\sqrt{z}\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1137.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.25.27.1138.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1139.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{z}\sqrt{\frac{1}{z}}\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1140.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 1)$$

01.25.27.1141.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1142.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1143.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\sqrt{z-1} \sqrt{\frac{1}{z-1}} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1144.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (-\infty, 1)$$

01.25.27.1145.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.25.27.1146.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\sqrt{z-1} \sqrt{\frac{1}{z-1}} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1147.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |\arg(z)| < \pi$$

01.25.27.1148.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1149.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{z}\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1150.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1151.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.25.27.1152.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; (i\, m(z) \in \mathbb{R} \land i\, m(z) < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1153.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1154.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1155.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \frac{1}{2}\sqrt{z-1}\sqrt{\frac{1}{z-1}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1156.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; |\arg(z)| < \pi$$

01.25.27.1157.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2\,z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ (z \in \mathbb{R} \land z < 0)$$

01.25.27.1158.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2\,z}}\right) = \frac{1}{2}\sqrt{z}\,\sqrt{\frac{1}{z}}\,\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2\,z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2\,z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1159.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2\,z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} /;\ \operatorname{Im}(z) > 0$$

01.25.27.1160.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2\,z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1161.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2\,z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} /;\ (z \in \mathbb{R} \land z < -1)$$

01.25.27.1162.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2\,z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1163.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2\,z}}\right) = \frac{\sqrt{-z-1}\,\sqrt{z-1}\,\sqrt{z}}{2\sqrt{1-z^2}}\sqrt{\frac{1}{z}}\,\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2\,z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1164.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2\,z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ z \notin (-\infty, 1)$$

01.25.27.1165.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2\,z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ (z \in \mathbb{R} \land z < 1)$$

01.25.27.1166.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{\sqrt{z-1}}{2}\sqrt{\frac{1}{z-1}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1167.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1168.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1169.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1170.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{\pi}{2}\left(z\sqrt{-\frac{1}{z^2}} - i\sqrt{z+1}\sqrt{\frac{1}{z+1}} + i\right) + \frac{1}{2}\sqrt{\frac{z+1}{1-z}}\sqrt{\frac{1-z}{z+1}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1171.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2-1}\right)$ and $\cosh^{-1}(z)$

01.25.27.1172.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \cosh^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.25.27.1173.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \cosh^{-1}(z) - \pi i \text{ /; } \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1174.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \cosh^{-1}(z) + \pi i \text{ /; } -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1175.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -\cosh^{-1}(z) + \pi i \text{ /; } (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0054.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \cosh^{-1}(z) + \frac{\pi i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) \text{ /; } \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) > 0$$

01.25.27.0055.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \cosh^{-1}(z) + \frac{\pi i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) + 2 i \pi \text{ /; } \operatorname{Im}(z) < 0 \land \operatorname{Re}(z) \leq 0$$

01.25.27.1176.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{z}{\sqrt{z-1}\sqrt{z+1}}\sqrt{\frac{z^2-1}{z^2}}\cosh^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1177.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \cosh^{-1}\left(\frac{1}{z}\right) \text{ /; } -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.25.27.1178.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \pi i \text{ /; } \frac{\pi}{2} \leq \arg(z) < \pi$$

01.25.27.1179.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi i \text{ /; } -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1180.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi i \text{ /; } (z \in \mathbb{R} \land z < -1)$$

01.25.27.1181.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi\sqrt{z^2-z^4}}{2\,z\sqrt{z^2-1}}\left(1-\sqrt{\frac{1}{z^2}}\;z\right) + \sqrt{\frac{1}{z+1}}\;\sqrt{z+1}\;z\sqrt{\frac{1}{z^2}}\;\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1182.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) /;\ \mathrm{Re}(z) > 0$$

01.25.27.1183.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi\,i /;\ \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1184.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\,i /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1185.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi\,i /;\ (z \in \mathbb{R} \land z < -1)$$

01.25.27.1186.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(1-\sqrt{\frac{1}{z^2}}\;z\right) + \frac{\sqrt{z-1}\;z^{3/2}\sqrt{z+1}}{\sqrt{z^2-1}}\sqrt{\frac{1}{z}}\;\sqrt{\frac{1}{z^2}}\;\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1187.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1188.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i\, z \in \mathbb{R} \wedge i\, z > 0)$$

01.25.27.1189.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1190.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1191.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i /; (i\, z \in \mathbb{R} \wedge i\, z < 0)$$

01.25.27.1192.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i /; (z \in \mathbb{R} \wedge z < 0)$$

01.25.27.1193.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi \sqrt{-z^2}}{2\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right) + \frac{\sqrt{1-z}\,\sqrt{-z}\,\sqrt{z^2}}{\sqrt{z-1}} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1194.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \le \arg(z) < \frac{\pi}{2}$$

01.25.27.1195.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i /; \frac{\pi}{2} \le \arg(z) < \pi$$

01.25.27.1196.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i \,/;\, -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1197.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i \,/;\, (z \in \mathbb{R} \land z < -1)$$

01.25.27.1198.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\sqrt{z+1}}{\sqrt{1-\frac{1}{z^2}}} \sqrt{\frac{z-1}{z^2}} \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{z^2-z^4}}{2\sqrt{z^2-1}} \sqrt{\frac{1}{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right)$$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(2z\sqrt{z^2-1}\right)$ and $\cosh^{-1}(z)$

01.25.27.1199.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{2z^2}{\sqrt{-z^4}}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right) /;\, \frac{\pi}{4} \le |\arg(z)| \le \frac{3\pi}{4}$$

01.25.27.1200.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}\,z+1}}\sqrt{\sqrt{2}\,z+1} + \sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}\,z}}\sqrt{1-\sqrt{2}\,z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right) - \frac{2\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1201.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\left(\frac{\pi}{2}-\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\cosh^{-1}\left(\frac{1}{z}\right)\right) /; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.1202.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2}$$

$$\left(\pi\left(\frac{\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}z^3}{1-z^2}+\sqrt{\frac{1}{z^2}}z-\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}-2\right)+\right.$$

$$\left.4\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\cosh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$ and $\cosh^{-1}(z)$

01.25.27.1203.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{1}{2}\cosh^{-1}(z)-\frac{\pi i}{4} /; 0 < \arg(z) \leq \pi$$

01.25.27.1204.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\pi i}{4}+\frac{1}{2}\cosh^{-1}(z) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1205.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\pi i}{4}-\frac{1}{2}\cosh^{-1}(z) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1206.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\Big/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\Big/\sqrt{2z^2}\right)$ and $\cosh^{-1}(z)$

01.25.27.1207.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} /;\ 0 < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1208.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}(z) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1209.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}(z) /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1210.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right) = \frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\Big/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)\Big/\left(2z^2\right)}\right)$ and $\cosh^{-1}(z)$

01.25.27.1211.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} /; 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.1212.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = \frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{4} /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1213.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = -\frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{4} /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1214.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = -\frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1215.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z} \Big/ \sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z} \Big/ \sqrt{2z}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1216.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.1217.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1218.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{3\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1219.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1220.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ (z \in \mathbb{R} \land z < 0)$$

01.25.27.1221.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ (z \in \mathbb{R} \land z > 1)$$

01.25.27.1222.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{z}\left(\frac{\pi}{2} - \frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\cosh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1223.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.1224.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1225.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1226.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1227.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1228.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1229.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi}{4z}\left(\sqrt{\frac{i}{z}}\sqrt{-\frac{1}{z}}\sqrt{-iz}\, z^{3/2} + 3i\left(\sqrt{1+\frac{1}{z}}\sqrt{\frac{z}{z+1}} - 1\right)z - \sqrt{-z^2}\left(1 + i\sqrt{\frac{i}{z}}\sqrt{iz}\right)\right) - \frac{\sqrt{z-1}\, z^{3/2}}{2\sqrt{-z(z+1)}}\sqrt{\frac{z+1}{z-1}}\sqrt{-\frac{1}{z^2}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$

01.25.27.1230.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; 0 \le \arg(z) < \pi$$

01.25.27.1231.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.25.27.1232.01

$$\sinh^{-1}(z) = \frac{1}{2}\pi\sqrt{-\frac{1}{z^2}}\, z + \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$

01.25.27.1233.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; 0 \le \arg(z) \le \frac{\pi}{2}$$

01.25.27.1234.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1235.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1236.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1237.01

$$\sinh^{-1}(z) = \frac{1}{2}\pi\sqrt{-\frac{1}{z^2}}\, z + \frac{\sqrt{z^2}}{z}\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right)$

01.25.27.1238.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1239.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1240.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1241.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1242.01

$$\sinh^{-1}(z) = \frac{1}{2} \pi \sqrt{-\frac{1}{z^2}}\, z + \frac{z \sqrt{-z^2-1}}{\sqrt{-z^2 (z^2+1)}} \tanh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$

01.25.27.1243.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1244.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1245.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1246.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1247.01

$$\sinh^{-1}(z) = \frac{1}{2} \pi \sqrt{-\frac{1}{z^2}}\, z + \frac{z \sqrt{-z^2-1}}{\sqrt{-z^2 (z^2+1)}} \tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$

01.25.27.1248.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) /; i z \notin (-\infty, -1) \bigwedge i z \notin (1, \infty)$$

01.25.27.1249.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) + \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.27.1250.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.1251.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$

01.25.27.1252.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; \mathrm{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.25.27.1253.01

$$\sinh^{-1}(z) = -\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; \mathrm{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.25.27.1254.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) + \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.27.1255.01

$$\sinh^{-1}(z) = -\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.1256.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{z^2}}{z}\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$

01.25.27.1257.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.1258.01

$$\sinh^{-1}(z) = -\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.1259.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) + \pi\,i /; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.1260.01

$$\sinh^{-1}(z) = -\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) - \pi\,i /; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.1261.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{-z^2\left(z^2+1\right)}}{z\sqrt{-z^2-1}}\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.25.27.1262.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.1263.01

$$\sinh^{-1}(z) = -\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.1264.01

$$\sinh^{-1}(z) = \tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) + \pi\,i /; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.1265.01

$$\sinh^{-1}(z) = -\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) - \pi\,i /; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.1266.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{z^2}}{z}\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{1+2z^2}\right)$

01.25.27.1267.01

$$\sinh^{-1}(z) = \frac{1}{2}\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{2z^2+1}\right) /; |\arg(z)| \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4}$$

01.25.27.1268.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{-\frac{i}{z}}\,\sqrt{iz}\,\sqrt{\frac{1}{i\sqrt{2}\,z-1}}\,\sqrt{i\sqrt{2}\,z-1} + i\sqrt{\frac{i}{z}}\,\sqrt{-iz}\,\sqrt{-i\sqrt{2}\,z-1}\,\sqrt{-\frac{1}{\sqrt{2}\,iz+1}} + \frac{z\sqrt{-z^2-1}}{\sqrt{z^4+z^2}}\right) + \frac{1}{2}\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{2z^2+1}\right)$$

Involving $\sinh^{-1}(z)$ and $\tan^{-1}\left(\frac{1+2z^2}{2z\sqrt{-1-z^2}}\right)$

01.25.27.1269.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (iz \in \mathbb{R} \land -1 < iz < 0)$$

01.25.27.1270.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.25.27.1271.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) /; (iz \in \mathbb{R} \land iz > 1)$$

01.25.27.1272.01

$$\sinh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) /; (iz \in \mathbb{R} \land iz < -1)$$

01.25.27.1273.01

$$\sinh^{-1}(z) = \frac{1}{2}\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\,z - \sqrt{iz+1}\,\sqrt{\frac{1}{iz+1}} + \sqrt{\frac{1}{1-iz}}\,\sqrt{1-iz}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$

01.25.27.1274.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /;\ -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1275.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /;\ \operatorname{Re}(z) < 0$$

01.25.27.1276.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /;\ (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1277.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{i z-1}}{\sqrt{1-i z}} \tanh^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right)$

01.25.27.1278.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{1-i z}}\right) /;\ \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1279.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{1-i z}}\right) /;\ \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1280.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{1-i z}}\right) /;\ (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1281.01

$$\sinh^{-1}(z) = \frac{2 i \sqrt{-i z-1}}{\sqrt{i z+1}} \tanh^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{1-i z}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right)$

01.25.27.1282.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /;\ -1 \leq \operatorname{Im}(z) < 1 \bigvee -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1283.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /;\ \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < -1$$

01.25.27.1284.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1285.01

$$\sinh^{-1}(z) = \frac{2\sqrt{z^2+1}}{\sqrt{-i+z}\,\sqrt{i+z}} \tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right)$

01.25.27.1286.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; |\text{Im}(z)| < 1 \lor \text{Re}(z) < 0$$

01.25.27.1287.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; \text{Re}(z) \geq 0 \land \text{Im}(z) \geq 1 \lor \text{Re}(z) > 0 \land \text{Im}(z) \leq -1$$

01.25.27.1288.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1289.01

$$\sinh^{-1}(z) = -\frac{2\sqrt{z^2+1}}{\sqrt{-i-z}\,\sqrt{i-z}} \tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right)$

01.25.27.1290.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; \text{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1291.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; \text{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1292.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1293.01

$$\sinh^{-1}(z) = \frac{2 i\sqrt{-i z-1}}{\sqrt{i z+1}} \tanh^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right)$

01.25.27.1294.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1295.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1296.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1297.01

$$\sinh^{-1}(z) = \pi i\left(\frac{1}{2} - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}}\right) - \frac{2 i \sqrt{i z+1}}{\sqrt{-i z-1}}\sqrt{\frac{z^2+1}{z^2}}\sqrt{\frac{z^2}{z^2+1}}\tanh^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-i z-1}}\right)$

01.25.27.1298.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-i z-1}}\right) /; \operatorname{Re}(z) > 0$$

01.25.27.1299.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-i z-1}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > -1)$$

01.25.27.1300.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-i z-1}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1301.01

$$\sinh^{-1}(z) = \pi i\left(\frac{1}{2} - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}}\right) - \frac{2 i \sqrt{i z+1}}{\sqrt{-i z-1}}\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-i z-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)$

01.25.27.1302.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) /; -1 \le \operatorname{Im}(z) < 1 \lor \operatorname{Re}(z) > 0$$

01.25.27.1303.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) \leq -1$$

01.25.27.1304.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1305.01

$$\sinh^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}}\right) + \frac{2\sqrt{z^2+1}}{\sqrt{-i+z}\sqrt{i+z}}\tanh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$

01.25.27.1306.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; -1 < \operatorname{Im}(z) \leq 1 \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1307.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq -1$$

01.25.27.1308.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1309.01

$$\sinh^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}}\right) + \frac{2 i\sqrt{i-z}\sqrt{1-i z}}{\sqrt{-i-z}\sqrt{i z+1}}\tanh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right)$

01.25.27.1310.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1311.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1312.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1313.01

$$\sinh^{-1}(z) = \pi i \left(\frac{1}{2} - \sqrt{i z + 1} \sqrt{\frac{1}{i z + 1}}\right) - \frac{2 i \sqrt{i z - 1}}{\sqrt{1 - i z}} \tanh^{-1}\left(\sqrt{\frac{z + i}{z - i}}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\tanh^{-1}(z)$

01.25.27.0061.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2 \tanh^{-1}(z) \;/;\; |z| < 1$$

01.25.27.1314.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi i - 2 \tanh^{-1}(z) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.25.27.1315.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi i - 2 \tanh^{-1}(z) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.25.27.1316.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2 \tanh^{-1}(z) - \frac{\pi \sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.25.27.1317.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{2(1 - i z)}{1 + i z} \sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} \tanh^{-1}(z) - \frac{\pi \sqrt{-z^2}}{2 z} \left(1 - \frac{1 - i z}{1 + i z} \sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1318.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi i + 2 \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1 \land (\mathrm{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.25.27.1319.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi i + 2 \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1 \land (\mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.25.27.1320.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi \sqrt{-\frac{1}{z^2}}\, z + 2 \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1$$

01.25.27.1321.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2 \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1$$

01.25.27.1322.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{1}{2}\pi z\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right)+\frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\tanh^{-1}(z^r)$

01.25.27.1323.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2\,i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\tanh^{-1}\left(z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\tanh^{-1}(z)$

01.25.27.1324.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2\tanh^{-1}(z)\ /;\ |z|<1$$

01.25.27.1325.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i+2\tanh^{-1}(z)\ /;\ |z|>1\bigwedge 0<\arg(z)\le\pi$$

01.25.27.1326.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i+2\tanh^{-1}(z)\ /;\ |z|>1\bigwedge -\pi<\arg(z)\le 0$$

01.25.27.1327.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = 2\tanh^{-1}(z)+\frac{\pi\sqrt{-z^2}}{z}\ /;\ |z|>1$$

01.25.27.1328.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tanh^{-1}(z)+\frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1329.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i-2\tanh^{-1}\left(\frac{1}{z}\right)\ /;\ |z|<1\land(\operatorname{Im}(z)>0\lor(z\in\mathbb{R}\land z>0))$$

01.25.27.1330.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i-2\tanh^{-1}\left(\frac{1}{z}\right)\ /;\ |z|<1\land(\operatorname{Im}(z)<0\lor(z\in\mathbb{R}\land z<0))$$

01.25.27.1331.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi\sqrt{-\frac{1}{z^2}}\, z - 2\tanh^{-1}\left(\frac{1}{z}\right) /;\ |z| < 1$$

01.25.27.1332.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = 2\tanh^{-1}\left(\frac{1}{z}\right) /;\ |z| > 1$$

01.25.27.1333.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) - \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\tanh^{-1}(z^r)$

01.25.27.1334.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2\, i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\tanh^{-1}\left(z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\tanh^{-1}(\sqrt{z})$

01.25.27.1335.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} + \tanh^{-1}(\sqrt{z}) /;\ 0 < \arg(z) \le \pi$$

01.25.27.1336.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\pi i}{2} + \tanh^{-1}(\sqrt{z}) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1337.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} - \tanh^{-1}(\sqrt{z}) /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1338.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(\frac{\sqrt{-z}}{\sqrt{z}}\tanh^{-1}(\sqrt{z}) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1339.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ z \notin (0, 1)$$

01.25.27.1340.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi\, i \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1341.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\, i}{2}\left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1342.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\; z \notin (-\infty, 1)$$

01.25.27.1343.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1344.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\pi\, i - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1345.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \sqrt{\frac{1}{z-1}} \sqrt{z-1} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\, i}{2}\left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.25.27.1346.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi\, i}{2} + \tanh^{-1}\left(\sqrt{z}\right) /;\; -\pi < \arg(z) \leq 0$$

01.25.27.1347.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\frac{\pi\, i}{2} + \tanh^{-1}\left(\sqrt{z}\right) /;\; \operatorname{Im}(z) > 0$$

01.25.27.1348.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi\, i}{2} - \tanh^{-1}\left(\sqrt{z}\right) /;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1349.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{1-z}\,\sqrt{\frac{1}{z-1}}\left(\frac{\pi}{2} - \frac{\sqrt{-z}}{\sqrt{z}}\tanh^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1350.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 1)$$

01.25.27.1351.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1352.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1353.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{z}\,\sqrt{\frac{1}{z}}\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1354.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (0, 1)$$

01.25.27.1355.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1356.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.25.27.1357.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) /; z \notin (1, \infty)$$

01.25.27.1358.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\tanh^{-1}\left(\sqrt{z}\right) - \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.0060.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{1-z} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2}\left(1 - \sqrt{1-z} \sqrt{\frac{1}{1-z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1359.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1360.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1361.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1362.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{\frac{1}{1-z}} \sqrt{1-z} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi \sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1363.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1364.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1365.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1366.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.25.27.1367.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{\frac{1}{z}} \sqrt{z} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi \sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.25.27.1368.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\tanh^{-1}\left(\sqrt{z}\right) /; z \notin (0, \infty)$$

01.25.27.1369.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \tanh^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.25.27.1370.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \tanh^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.25.27.1371.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1} \sqrt{z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2}\left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1372.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.1373.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1374.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge z > 0)$$

01.25.27.1375.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{-z}} \sqrt{\frac{z}{1-z}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi \sqrt{-z}}{2\sqrt{z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1376.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.1377.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1378.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.25.27.1379.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1380.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\sqrt{-1+z}\,\sqrt{-z}\,\sqrt{\frac{1}{z}}\,\sqrt{\frac{1}{1-z}}\,\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\sqrt{-z}}{2\sqrt{z}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.25.27.1381.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) /; z \notin (1, \infty)$$

01.25.27.1382.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.0059.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2}\left(1 - \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1383.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.25.27.1384.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1385.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{1}{2}\pi\sqrt{-\frac{1}{z}}\sqrt{z}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1386.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \le \arg(z) < \pi$$

01.25.27.1387.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1388.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1389.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{z}\sqrt{\frac{1}{z}}\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{1}{2}\pi\sqrt{-\frac{1}{z}}\sqrt{z}$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\tanh^{-1}(z)$

01.25.27.1390.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + \tanh^{-1}(z) /; 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1391.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1392.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - \tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1393.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - \tanh^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0056.02

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}} \left(\frac{\sqrt{-z^2}}{z} \tanh^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1394.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1395.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1396.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\tanh^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1397.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \tanh^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1398.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}} \left(\frac{\pi i}{2}\left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}}\right) + \frac{\sqrt{-z^2}}{z} \tanh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\tanh^{-1}(z)$

01.25.27.1399.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\frac{\pi i}{2} + \tanh^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.1400.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi i}{2} + \tanh^{-1}(z) \,/;\, -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.25.27.1401.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi i}{2} - \tanh^{-1}(z) \,/;\, \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.25.27.1402.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\frac{\pi i}{2} - \tanh^{-1}(z) \,/;\, -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1403.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \sqrt{-\frac{1}{1-z^2}}\,\sqrt{1-z^2}\left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z}\tanh^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1404.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \tanh^{-1}\left(\frac{1}{z}\right) \,/;\, -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1405.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\tanh^{-1}\left(\frac{1}{z}\right) \,/;\, \frac{\pi}{2} \leq \arg(z) < \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1406.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \pi i + \tanh^{-1}\left(\frac{1}{z}\right) \,/;\, (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1407.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \pi i - \tanh^{-1}\left(\frac{1}{z}\right) \,/;\, (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1408.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\sqrt{1-z^2}\,\sqrt{\frac{1}{z^2-1}}\left(\frac{\pi i}{2}\left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}}\right) + \frac{\sqrt{-z^2}}{z}\tanh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\tanh^{-1}(z)$

01.25.27.0057.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \tanh^{-1}(z) /; z \notin (-\infty, -1) \bigwedge z \notin (1, \infty)$$

01.25.27.1409.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\tanh^{-1}(z) - \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1410.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\tanh^{-1}(z) + \pi i /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.0058.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} \tanh^{-1}(z) + \frac{\pi i}{2}\left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1411.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1412.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1413.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1414.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1415.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2}\left(-i \sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}} \sqrt{1-z} - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\tanh^{-1}(z)$

01.25.27.1416.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1417.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1418.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\pi i + \tanh^{-1}(z) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1419.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\pi i - \tanh^{-1}(z) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1420.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-z}}\sqrt{1-z} + \sqrt{\frac{1}{z+1}}\sqrt{z+1} - 2\right) + \frac{z\sqrt{1-z^2}}{\sqrt{z^2}}\sqrt{\frac{1}{1-z^2}}\tanh^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1421.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1422.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1423.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1424.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1425.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\tanh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\tanh^{-1}(z)$

01.25.27.1426.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1427.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1428.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \tanh^{-1}(z) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1429.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\tanh^{-1}(z) + \pi i /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1430.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2}\left(2 - \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) - \frac{\sqrt{-z}\,\sqrt{z^2-1}}{\sqrt{z}}\,\sqrt{\frac{1}{1-z^2}}\,\tanh^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1431.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1432.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1433.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.25.27.1434.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1435.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z}\sqrt{z^2-1}}{\sqrt{-z}} \sqrt{\frac{1}{1-z^2}} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^4}}{2z^2}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\tanh^{-1}(z)$

01.25.27.1436.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1437.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1438.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \tanh^{-1}(z) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1439.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\tanh^{-1}(z) + \pi i /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1440.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) == \frac{\pi i}{2}\left(-\sqrt{\frac{1}{1-z}}\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\sqrt{z+1} + 2\right) + \frac{z}{\sqrt{z^2}}\tanh^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1441.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) == \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1442.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) == -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1443.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) == -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1444.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) == \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1445.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) == \frac{z}{\sqrt{z^2}}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{1}{2}\pi\sqrt{\frac{1}{1-z^2}}\sqrt{z^2-1}$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1-z^2}} \Big/ \left(\sqrt{2}\,(1-z^2)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1-z^2}} \Big/ \left(\sqrt{2}\,(1-z^2)^{1/4}\right)\right)$ and $\tanh^{-1}(z)$

01.25.27.1446.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) == \frac{1}{2}\tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1447.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = -\frac{1}{2}\tanh^{-1}(z)\;/;\;\frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.25.27.1448.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = \frac{\sqrt{z^2}}{2z}\tanh^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1-z^2}} \Big/ \left(\sqrt{2}\,(1-z^2)^{1/4}\right)\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1449.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,(1-z^2)^{1/4}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\;/;\;0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1450.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}\;/;\;-\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1451.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}\;/;\;\frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1452.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\;/;\;-\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1453.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,(1-z^2)^{1/4}}\right) = \frac{\sqrt{z^2}}{2z}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\,\sqrt{z^2} + \sqrt{\frac{1}{1-z^2}}\,\sqrt{1-z^2} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{z^2-1}}\Big/\left(\sqrt{2}\,(z^2-1)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{z^2-1}}\Big/\left(\sqrt{2}\,(z^2-1)^{1/4}\right)\right)$ and $\tanh^{-1}(z)$

01.25.27.1454.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right)=\frac{1}{2}\tanh^{-1}(z)-\frac{\pi i}{4}\;/;\;0<\arg(z)\leq\frac{\pi}{2}\bigvee-\pi<\arg(z)\leq-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land-1<z<1)$$

01.25.27.1455.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right)=\frac{1}{2}\tanh^{-1}(z)+\frac{\pi i}{4}\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.25.27.1456.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right)=-\frac{1}{2}\tanh^{-1}(z)+\frac{3\pi i}{4}\;/;\;(z\in\mathbb{R}\land z<-1)$$

01.25.27.1457.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right)=$$

$$\frac{\pi}{4}\left(i\sqrt{z}\sqrt{\frac{1}{z}}+\frac{\sqrt{-z^4}}{z^2}+i\sqrt{\frac{z-1}{z}}\sqrt{\frac{z}{z-1}}-2i\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right)+\frac{1}{2}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\tanh^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{z^2-1}}\Big/\left(\sqrt{2}\,(z^2-1)^{1/4}\right)\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1458.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1459.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1460.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1461.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,(z^2-1)^{1/4}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1462.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,(z^2-1)^{1/4}}\right) =$$

$$\frac{1}{4}\pi\left(z\sqrt{-\frac{1}{z^2}} + \frac{\sqrt{-z^4}}{z^2} + i\sqrt{-z-1}\,\sqrt{-\frac{1}{z+1}} - i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1-z^2}\right)\Big/\left(2\sqrt{1-z^2}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1-z^2}\right)\Big/\left(2\sqrt{1-z^2}\right)}\right)$ and $\tanh^{-1}(z)$

01.25.27.1463.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1464.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1465.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\tanh^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1-z^2}\right)\Big/\left(2\sqrt{1-z^2}\right)}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1466.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1467.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1468.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1469.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1470.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\sqrt{z^2} + \sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{z^2-1}\right)\Big/\left(2\sqrt{z^2-1}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{z^2-1}\right)\Big/\left(2\sqrt{z^2-1}\right)}\right)$ and $\tanh^{-1}(z)$

01.25.27.1471.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}(z) - \frac{\pi i}{4} /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1472.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}(z) + \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1473.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}(z) - \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1474.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}(z) + \frac{\pi i}{4} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.1475.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}(z) + \frac{3\pi i}{4} /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1476.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2} i \sqrt{-\frac{i}{z}} \sqrt{-i z} \tanh^{-1}(z) + \frac{\pi i}{4}\left(2 + i z \sqrt{-\frac{1}{z^2}} - \sqrt{-\frac{i}{z}} \sqrt{i z} - \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{z^2-1}\right) \Big/ \left(2\sqrt{z^2-1}\right)}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1477.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0$$

01.25.27.1478.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1479.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1480.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.1481.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{\pi}{4}\left(-\sqrt{z}\sqrt{-\frac{1}{z}} - 2 i \sqrt{z}\sqrt{\frac{1}{z}} + 2 i + \frac{\sqrt{z^2}}{\sqrt{z}}\sqrt{-\frac{1}{z}}\right) + \frac{1}{2} i \sqrt{-\frac{i}{z}}\sqrt{-i z}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\coth^{-1}$

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$

01.25.27.1482.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) \;/;\; i z \notin (-\infty, -1) \bigwedge i z \notin (1, \infty)$$

01.25.27.1483.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) + \pi i \;/;\; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1484.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) - \pi i \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1485.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \coth^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$

01.25.27.1486.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.1487.01

$$\sinh^{-1}(z) = -\coth^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.1488.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) + \pi\,i /; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.1489.01

$$\sinh^{-1}(z) = -\coth^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) - \pi\,i /; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.1490.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{z^2}}{z}\coth^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$

01.25.27.1491.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.1492.01

$$\sinh^{-1}(z) = -\coth^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.1493.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) + \pi\,i /; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.1494.01

$$\sinh^{-1}(z) = -\coth^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) - \pi\,i /; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.1495.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{-z^2\left(z^2+1\right)}}{z\sqrt{-z^2-1}}\coth^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$

01.25.27.1496.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /; \operatorname{Re}(z) > 0 \lor (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.25.27.1497.01

$$\sinh^{-1}(z) = -\coth^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /; \operatorname{Re}(z) < 0 \lor (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.25.27.1498.01

$$\sinh^{-1}(z) = \coth^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) + \pi\, i /; (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.25.27.1499.01

$$\sinh^{-1}(z) = -\coth^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) - \pi\, i /; (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.25.27.1500.01

$$\sinh^{-1}(z) = \frac{\pi}{2\sqrt{z^2+1}}\left((i+z)\sqrt{\frac{i-z}{i+z}} - \sqrt{\frac{i+z}{i-z}}\,(i-z)\right) + \frac{\sqrt{z}\,\sqrt{-1-z^2}}{\sqrt{-z}\,\sqrt{1+z^2}}\coth^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)$

01.25.27.1501.01

$$\sinh^{-1}(z) = \frac{\pi\, i}{2} + \coth^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; 0 \le \arg(z) < \pi$$

01.25.27.1502.01

$$\sinh^{-1}(z) = -\frac{\pi\, i}{2} + \coth^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.25.27.1503.01

$$\sinh^{-1}(z) = \frac{1}{2}\pi\sqrt{-\frac{1}{z^2}}\, z + \coth^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$

01.25.27.1504.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1505.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1506.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \coth^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1507.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \coth^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1508.01

$$\sinh^{-1}(z) = \frac{1}{2} \pi \sqrt{-\frac{1}{z^2}}\, z + \frac{\sqrt{z^2}}{z} \coth^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$

01.25.27.1509.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1510.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1511.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \coth^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1512.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \coth^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1513.01

$$\sinh^{-1}(z) = \frac{1}{2} \pi \sqrt{-\frac{1}{z^2}}\, z + \frac{z \sqrt{-z^2-1}}{\sqrt{-z^2 \left(z^2+1\right)}} \coth^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.25.27.1514.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1515.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1516.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1517.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1518.01

$$\sinh^{-1}(z) = \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} + \frac{\sqrt{z^2}}{z} \coth^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{2 z \sqrt{1+z^2}}{1+2 z^2}\right)$

01.25.27.1519.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} \coth^{-1}\left(\frac{2 z \sqrt{1+z^2}}{1+2 z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1520.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} \coth^{-1}\left(\frac{2 z \sqrt{1+z^2}}{1+2 z^2}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1521.01

$$\sinh^{-1}(z) = -\frac{3 \pi i}{4} + \frac{1}{2} \coth^{-1}\left(\frac{2 z \sqrt{1+z^2}}{1+2 z^2}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1522.01

$$\sinh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2}\coth^{-1}\left(\frac{2z\sqrt{1+z^2}}{1+2z^2}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1523.01

$$\sinh^{-1}(z) = \frac{1}{2}\coth^{-1}\left(\frac{2z\sqrt{1+z^2}}{1+2z^2}\right) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\, z - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}} + \sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{1+2z^2}{2z\sqrt{z^2+1}}\right)$

01.25.27.1524.01

$$\sinh^{-1}(z) = \frac{1}{2}\coth^{-1}\left(\frac{1+2z^2}{2z\sqrt{z^2+1}}\right) /; |\arg(z)| \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4}$$

01.25.27.1525.01

$$\sinh^{-1}(z) = \frac{\pi}{4}\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{-\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{i\sqrt{2}\, z-1}}\sqrt{i\sqrt{2}\, z-1} + i\sqrt{\frac{i}{z}}\sqrt{-i z}\sqrt{-i\sqrt{2}\, z-1}\sqrt{-\frac{1}{\sqrt{2}\, i z+1}} + \frac{z\sqrt{-z^2-1}}{\sqrt{z^4+z^2}}\right) + \frac{1}{2}\coth^{-1}\left(\frac{1+2z^2}{2z\sqrt{z^2+1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$

01.25.27.1526.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1527.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1528.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1529.01

$$\sinh^{-1}(z) = \pi i\left(\frac{1}{2} - \sqrt{i z+1}\sqrt{\frac{1}{i z+1}}\right) - \frac{2i\sqrt{i z+1}}{\sqrt{-i z-1}}\sqrt{\frac{z^2+1}{z^2}}\sqrt{\frac{z^2}{z^2+1}}\coth^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right)$

01.25.27.1530.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-1 - i z}}{\sqrt{1 - i z}}\right) /; \operatorname{Re}(z) > 0$$

01.25.27.1531.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-1 - i z}}{\sqrt{1 - i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > -1)$$

01.25.27.1532.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-1 - i z}}{\sqrt{1 - i z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1533.01

$$\sinh^{-1}(z) = \pi i\left(\frac{1}{2} - \sqrt{i z + 1}\sqrt{\frac{1}{i z + 1}}\right) - \frac{2 i \sqrt{i z + 1}}{\sqrt{-i z - 1}}\coth^{-1}\left(\frac{\sqrt{-1 - i z}}{\sqrt{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right)$

01.25.27.1534.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{z + i}}\right) /; -1 \leq \operatorname{Im}(z) < 1 \lor \operatorname{Re}(z) > 0$$

01.25.27.1535.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{z + i}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) \leq -1$$

01.25.27.1536.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{z + i}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1537.01

$$\sinh^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{i z + 1}\sqrt{\frac{1}{i z + 1}}\right) + \frac{2\sqrt{z^2 + 1}}{\sqrt{-i + z}\sqrt{i + z}}\coth^{-1}\left(\frac{\sqrt{z - i}}{\sqrt{z + i}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right)$

01.25.27.1538.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i - z}}{\sqrt{-i - z}}\right) /; -1 < \operatorname{Im}(z) \leq 1 \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1539.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i - z}}{\sqrt{-i - z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq -1$$

01.25.27.1540.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1541.01

$$\sinh^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{i z + 1}\sqrt{\frac{1}{i z + 1}}\right) + \frac{2 i \sqrt{i-z}\sqrt{1 - i z}}{\sqrt{-i-z}\sqrt{i z + 1}}\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right)$

01.25.27.1542.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; \operatorname{Re}(z) > 0$$

01.25.27.1543.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1544.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1545.01

$$\sinh^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{i z + 1}\sqrt{\frac{1}{i z + 1}}\right) + \frac{2 i \sqrt{-i z - 1}}{\sqrt{i z + 1}}\coth^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right)$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right)$

01.25.27.1546.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right) /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1547.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right) /; \operatorname{Re}(z) < 0$$

01.25.27.1548.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1549.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{i z - 1}}{\sqrt{1 - i z}}\coth^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right) + \left(\sqrt{1 - z i}\sqrt{\frac{1}{1 - z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-1-i z}}\right)$

01.25.27.1550.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-1-i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1551.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-1-i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1552.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-1-i z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1553.01

$$\sinh^{-1}(z) = \frac{2 i \sqrt{-i z - 1}}{\sqrt{i z + 1}} \coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{-1-i z}}\right) + \left(\sqrt{1 - z i}\,\sqrt{\frac{1}{1 - z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)$

01.25.27.1554.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) /; -1 \leq \operatorname{Im}(z) < 1 \bigvee -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1555.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < -1$$

01.25.27.1556.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1557.01

$$\sinh^{-1}(z) = \frac{2\sqrt{z^2+1}}{\sqrt{-i+z}\,\sqrt{i+z}} \coth^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right) + \left(\sqrt{1 - z i}\,\sqrt{\frac{1}{1 - z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$

01.25.27.1558.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; |\operatorname{Im}(z)| < 1 \lor \operatorname{Re}(z) < 0$$

01.25.27.1559.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq -1$$

01.25.27.1560.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1561.01

$$\sinh^{-1}(z) = -\frac{2\sqrt{z^2+1}}{\sqrt{-i-z}\,\sqrt{i-z}} \coth^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right)$

01.25.27.1562.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1563.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; \operatorname{Re}(z) < 0$$

01.25.27.1564.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1565.01

$$\sinh^{-1}(z) = -\frac{2 i \sqrt{i z - 1}}{\sqrt{1 - i z}} \coth^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) + \left(\sqrt{1-z i}\,\sqrt{\frac{1}{1-z i}} - \frac{1}{2}\right)\pi i$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\coth^{-1}(z)$

01.25.27.1566.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi i + 2\coth^{-1}(z) /; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.25.27.1567.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi i + 2\coth^{-1}(z) /; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.25.27.1568.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi\sqrt{-\frac{1}{z^2}}\; z + 2\coth^{-1}(z) \;/;\; |z| < 1$$

01.25.27.0065.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2\coth^{-1}(z) \;/;\; |z| > 1$$

01.25.27.1569.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{1}{2}\pi z\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) + \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1570.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1$$

01.25.27.1571.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \pi i - 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1 \land 0 < \arg(z) \leq \pi$$

01.25.27.1572.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -\pi i - 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1 \land -\pi < \arg(z) \leq 0$$

01.25.27.1573.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = -2\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.25.27.1574.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$ and $\coth^{-1}(z^r)$

01.25.27.1575.01

$$\sinh^{-1}\left(\frac{2z}{1-z^2}\right) = 2\, i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\coth^{-1}\left(z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\coth^{-1}(z)$

01.25.27.1576.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i - 2\coth^{-1}(z) \text{ /; } |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.25.27.1577.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i - 2\coth^{-1}(z) \text{ /; } |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.25.27.1578.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi \sqrt{-\frac{1}{z^2}}\, z - 2\coth^{-1}(z) \text{ /; } |z| < 1$$

01.25.27.1579.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = 2\coth^{-1}(z) \text{ /; } |z| > 1$$

01.25.27.1580.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\frac{1}{2}\pi z \sqrt{-\frac{1}{z^2}} \left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2} + 1\right) - \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1581.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -2\coth^{-1}\left(\frac{1}{z}\right) \text{ /; } |z| < 1$$

01.25.27.1582.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\pi i + 2\coth^{-1}\left(\frac{1}{z}\right) \text{ /; } |z| > 1 \bigwedge 0 < \arg(z) \le \pi$$

01.25.27.1583.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = \pi i + 2\coth^{-1}\left(\frac{1}{z}\right) \text{ /; } |z| > 1 \bigwedge -\pi < \arg(z) \le 0$$

01.25.27.1584.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = 2\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}}{z} \text{ /; } |z| > 1$$

01.25.27.1585.01

$$\sinh^{-1}\left(\frac{2z}{z^2-1}\right) = -\frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}}{2z}\left(1 - \frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$ and $\coth^{-1}(z^r)$

01.25.27.1586.01

$$\sinh^{-1}\left(\frac{2\,z}{z^2-1}\right) = -2\,i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\,\coth^{-1}\left(z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.25.27.1587.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \coth^{-1}\left(\sqrt{z}\right) /;\ z \notin (0,\ 1)$$

01.25.27.1588.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\coth^{-1}\left(\sqrt{z}\right) - \pi\,i /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.0064.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}}\,\coth^{-1}\left(\sqrt{z}\right) + \frac{\pi\,i}{2}\left(\sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}} - 1\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1589.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi\,i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ 0 < \arg(z) \leq \pi$$

01.25.27.1590.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\pi\,i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ \mathrm{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1591.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi\,i}{2} - \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1592.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(\frac{\sqrt{-z}}{\sqrt{z}}\,\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1593.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi\,i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \mathrm{Im}(z) > 0$$

01.25.27.1594.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1595.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.25.27.1596.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(\sqrt{-z}\,\sqrt{\frac{1}{z}}\,\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.25.27.1597.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \coth^{-1}\left(\sqrt{z}\right) /; z \notin (-\infty, 1)$$

01.25.27.1598.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \coth^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1599.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\coth^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1600.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{z}\,\sqrt{\frac{1}{z}}\,\coth^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2}\left(1 - \sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1601.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.1602.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.1603.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1604.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{\frac{1}{z}}\,\sqrt{z}\,\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{1}{2}\pi\sqrt{1-z}\,\sqrt{\frac{1}{z-1}}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1605.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) \leq 0$$

01.25.27.1606.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.1607.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{1}{2}\pi\sqrt{1-z}\,\sqrt{\frac{1}{z-1}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.25.27.1608.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; 0 < \arg(z) \leq \pi \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1609.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1610.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1611.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{\frac{1}{1-z}}\,\sqrt{1-z}\,\coth^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1612.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (1, \infty)$$

01.25.27.1613.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1614.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{1-z}\sqrt{\frac{1}{1-z}} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}\left(1 - \sqrt{1-z}\sqrt{\frac{1}{1-z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1615.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (1, \infty) \bigwedge z \notin (-\infty, 0)$$

01.25.27.1616.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1617.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1618.01

$$\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{1-z}\sqrt{\frac{1}{1-z}}\sqrt{z}\sqrt{\frac{1}{z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}\left(1 - \sqrt{1-z}\sqrt{\frac{1}{1-z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.25.27.1619.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{z}\right) /; 0 < \arg(z) \leq \pi$$

01.25.27.1620.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} - \coth^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1621.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.25.27.1622.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{-z}} \sqrt{\frac{z}{1-z}} \coth^{-1}\left(\sqrt{z}\right) + \frac{\pi \sqrt{-z}}{2\sqrt{z}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1623.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (0, \infty)$$

01.25.27.1624.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1625.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1626.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}\sqrt{z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}\left(\sqrt{1-z}\sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1627.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) \neq 0$$

01.25.27.1628.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.25.27.1629.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1630.01

$$\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\sqrt{z-1}\,\sqrt{-z}\,\sqrt{\frac{1}{1-z}}\,\sqrt{\frac{1}{z}}\,\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}\left(\sqrt{1-z}\,\sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.25.27.1631.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) \geq 0$$

01.25.27.1632.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1633.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \coth^{-1}\left(\sqrt{z}\right) + \frac{1}{2}\pi\sqrt{-\frac{1}{z}}\,\sqrt{z}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1634.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (1, \infty)$$

01.25.27.1635.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1636.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1637.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (1, \infty) \bigwedge z \notin (-\infty, 0)$$

01.25.27.1638.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1639.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i \text{ /; } (z \in \mathbb{R} \land z > 1)$$

01.25.27.1640.01

$$\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{z}\sqrt{\frac{1}{z}}\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{1-z}\sqrt{\frac{1}{1-z}}\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\coth^{-1}(z)$

01.25.27.1641.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \coth^{-1}(z) \text{ /; } -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1642.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\coth^{-1}(z) \text{ /; } \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1643.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\coth^{-1}(z) - \pi i \text{ /; } (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1644.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \coth^{-1}(z) - \pi i \text{ /; } (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.0062.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2}}{z}\coth^{-1}(z) \text{ /; } \operatorname{Im}(z) \neq 0$$

01.25.27.0063.02

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}}\left(\frac{\pi i}{2}\left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}}\right) + \frac{\sqrt{-z^2}}{z}\coth^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1645.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1646.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1647.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1648.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1649.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}} \left(\frac{\sqrt{-z^2}}{z} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\coth^{-1}(z)$

01.25.27.1650.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \coth^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1651.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\coth^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1652.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \pi i + \coth^{-1}(z) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1653.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \pi i - \coth^{-1}(z) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1654.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\sqrt{1-z^2}\,\sqrt{\frac{1}{z^2-1}}\left(\frac{\pi\,i}{2}\left(\frac{\sqrt{-z-1}}{\sqrt{z+1}}+\frac{\sqrt{z-1}}{\sqrt{1-z}}\right)+\frac{\sqrt{-z^2}}{z}\coth^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1655.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\frac{\pi\,i}{2}+\coth^{-1}\left(\frac{1}{z}\right)\;/;\;0<\arg(z)<\frac{\pi}{2}$$

01.25.27.1656.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi\,i}{2}+\coth^{-1}\left(\frac{1}{z}\right)\;/;\;-\frac{\pi}{2}\leq\arg(z)\leq 0$$

01.25.27.1657.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi\,i}{2}-\coth^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2}\leq\arg(z)\leq\pi$$

01.25.27.1658.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\frac{\pi\,i}{2}-\coth^{-1}\left(\frac{1}{z}\right)\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.1659.01

$$\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \sqrt{-\frac{1}{1-z^2}}\,\sqrt{1-z^2}\left(\frac{\pi}{2}-\frac{\sqrt{-z^2}}{z}\coth^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\coth^{-1}(z)$

01.25.27.1660.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi\,i}{2}+\coth^{-1}(z)\;/;\;\mathrm{Im}(z)>0\lor(z\in\mathbb{R}\land 0<z<1)$$

01.25.27.1661.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi\,i}{2}+\coth^{-1}(z)\;/;\;\mathrm{Im}(z)<0\lor(z\in\mathbb{R}\land -1<z<0)$$

01.25.27.1662.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1663.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - \coth^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1664.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1665.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) \;/;\; z \notin (-\infty, -1) \bigwedge z \notin (1, \infty)$$

01.25.27.1666.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) - \pi i \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1667.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) + \pi i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1668.01

$$\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}\left(\sqrt{1-z}\,\sqrt{\frac{1}{1-z}} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\coth^{-1}(z)$

01.25.27.1669.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \coth^{-1}(z) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1670.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + \coth^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1671.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1672.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - \coth^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1673.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1674.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1675.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1676.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\pi i + \coth^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1677.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\pi i - \coth^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1678.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-z}}\,\sqrt{1-z} + \sqrt{\frac{1}{z+1}}\,\sqrt{z+1} - 2\right) + \frac{z\sqrt{1-z^2}}{\sqrt{z^2}}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\coth^{-1}(z)$

01.25.27.1679.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1680.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - \coth^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1681.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \coth^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.25.27.1682.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + \coth^{-1}(z) \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1683.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z}\sqrt{z^2-1}}{\sqrt{-z}} \sqrt{\frac{1}{1-z^2}} \coth^{-1}(z) + \frac{\pi\sqrt{-z^4}}{2z^2}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1684.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1685.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \coth^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1686.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \coth^{-1}\left(\frac{1}{z}\right) + \pi i \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1687.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) + \pi i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1688.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2}\left(2-\sqrt{\frac{1}{1-z}}\sqrt{1-z}-\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right)-\frac{\sqrt{-z}\sqrt{z^2-1}}{\sqrt{z}}\sqrt{\frac{1}{1-z^2}}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\coth^{-1}(z)$

01.25.27.1689.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi i}{2}+\coth^{-1}(z) \;/;\; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1690.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{\pi i}{2}+\coth^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.1691.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{\pi i}{2}-\coth^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1692.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi i}{2}-\coth^{-1}(z) \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1693.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{z}{\sqrt{z^2}}\coth^{-1}(z)+\frac{1}{2}\pi\sqrt{\frac{1}{1-z^2}}\sqrt{z^2-1}$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1694.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1695.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1696.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.25.27.1697.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) + \pi i /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1698.01

$$\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi i}{2}\left(-\sqrt{\frac{1}{1-z}}\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\sqrt{z+1} + 2\right) + \frac{z}{\sqrt{z^2}}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1-z^2}} \Big/ \left(\sqrt{2}\,(1-z^2)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1-z^2}} \Big/ \left(\sqrt{2}\,(1-z^2)^{1/4}\right)\right)$ and $\coth^{-1}(z)$

01.25.27.1699.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,(1-z^2)^{1/4}}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1700.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1701.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1702.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi\, i}{4} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1703.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,(1-z^2)^{1/4}}\right) = \frac{\sqrt{z^2}}{2\,z}\coth^{-1}(z) + \frac{\pi\, i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\,\sqrt{z^2} + \sqrt{\frac{1}{1-z^2}}\,\sqrt{1-z^2} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{1-\sqrt{1-z^2}} \,/\left(\sqrt{2}\,(1-z^2)^{1/4}\right)\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1704.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) /;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1705.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) /;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1706.01

$$\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\,\sqrt[4]{1-z^2}}\right) = \frac{\sqrt{z^2}}{2\,z}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{z^2-1}} \,/\left(\sqrt{2}\,(z^2-1)^{1/4}\right)\right)$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{z^2-1}} \,/\left(\sqrt{2}\,(z^2-1)^{1/4}\right)\right)$ and $\coth^{-1}(z)$

01.25.27.1707.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\coth^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1708.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1709.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1710.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,(z^2-1)^{1/4}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1711.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,(z^2-1)^{1/4}}\right) =$$

$$\frac{1}{4}\pi\left(z\sqrt{-\frac{1}{z^2}} + \frac{\sqrt{-z^4}}{z^2} + i\sqrt{-z-1}\,\sqrt{-\frac{1}{z+1}} - i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\coth^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z-\sqrt{z^2-1}} \Big/ \left(\sqrt{2}\,(z^2-1)^{1/4}\right)\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1712.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 1)$$

01.25.27.1713.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1714.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{3\pi i}{4} /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1715.01

$$\sinh^{-1}\left(\frac{\sqrt{z-\sqrt{z^2-1}}}{\sqrt{2}\,\sqrt[4]{z^2-1}}\right) =$$

$$\frac{\pi}{4}\left(i\sqrt{z}\,\sqrt{\frac{1}{z}} + \frac{\sqrt{-z^4}}{z^2} + i\sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}} - 2i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1-z^2}\right)/\left(2\sqrt{1-z^2}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1-z^2}\right)/\left(2\sqrt{1-z^2}\right)}\right)$ and $\coth^{-1}(z)$

01.25.27.1716.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1717.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1718.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1719.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1720.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\coth^{-1}(z) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\sqrt{z^2} + \sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(1-\sqrt{1-z^2}\right)/\left(2\sqrt{1-z^2}\right)}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1721.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1722.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1723.01

$$\sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z^2}}{2\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{z^2-1}\right)/\left(2\sqrt{z^2-1}\right)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{z^2-1}\right)/\left(2\sqrt{z^2-1}\right)}\right)$ and $\coth^{-1}(z)$

01.25.27.1724.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}(z) \;/;\; \operatorname{Re}(z) > 0$$

01.25.27.1725.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1726.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1727.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}(z) /; (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.1728.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{\pi}{4}\left(-\sqrt{z}\sqrt{-\frac{1}{z}} - 2 i \sqrt{z}\sqrt{\frac{1}{z}} + 2 i + \frac{\sqrt{z^2}}{\sqrt{z}}\sqrt{-\frac{1}{z}}\right) + \frac{1}{2} i \sqrt{-\frac{i}{z}}\sqrt{-i z}\coth^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(z-\sqrt{z^2-1}\right)\Big/\left(2\sqrt{z^2-1}\right)}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.25.27.1729.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1730.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1731.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1732.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.25.27.1733.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{3\pi i}{4} /; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1734.01

$$\sinh^{-1}\left(\sqrt{\frac{z-\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) == \frac{1}{2}\,i\sqrt{-\frac{i}{z}}\,\sqrt{-i\,z}\,\coth^{-1}\left(\frac{1}{z}\right)+\frac{\pi\,i}{4}\left(2+i\,z\sqrt{-\frac{1}{z^2}}-\sqrt{-\frac{i}{z}}\,\sqrt{i\,z}-\sqrt{\frac{1}{1-z^2}}\,\sqrt{1-z^2}\right)$$

Involving csch^{-1}

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\mathrm{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.0067.01

$$\sinh^{-1}(z) == \mathrm{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}(-z)$

Involving $\sinh^{-1}(-z)$ and $\mathrm{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1735.01

$$\sinh^{-1}(-z) == -\mathrm{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\mathrm{csch}^{-1}(z)$

01.25.27.1736.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) == \mathrm{csch}^{-1}\left(\frac{1}{z}\right)\;/;\; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.25.27.1737.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) == -\mathrm{csch}^{-1}\left(\frac{1}{z}\right)\;/;\; \frac{\pi}{2} < \arg(z) \le \pi \bigwedge -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.25.27.1738.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) == \frac{\sqrt{z^2}}{z}\,\mathrm{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(a\left(b\,z^c\right)^m\right)$

Involving $\sinh^{-1}(a\,(b\,z^c)^m)$ and $\mathrm{csch}^{-1}\left(\frac{1}{a}\,b^{-m}\,z^{-m\,c}\right)$

01.25.27.1739.01

$$\sinh^{-1}(a\,(b\,z^c)^m) \equiv \frac{(b\,z^c)^m}{b^m\,z^{m\,c}}\,\text{csch}^{-1}\left(\frac{1}{a}\,b^{-m}\,z^{-m\,c}\right) /;\, 2\,m \in \mathbb{Z}$$

Involving $\sinh^{-1}\left(\sqrt{-1+c\,z}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\text{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right)$

01.25.27.1740.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv \frac{\pi\,i}{2} + \text{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right) /;\, 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1741.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv -\frac{\pi\,i}{2} - \text{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right) /;\, \text{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1742.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(-i\,\text{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\text{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.1743.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv \frac{\pi\,i}{2} + \text{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /;\, 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1744.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv -\frac{\pi\,i}{2} + \text{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /;\, \text{Im}(z) < 0$$

01.25.27.1745.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv -\frac{\pi\,i}{2} - \text{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /;\, (z \in \mathbb{R} \land z > 1)$$

01.25.27.1746.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) \equiv \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(-\sqrt{z}\,\sqrt{-\frac{1}{z}}\,\text{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-z-1}\right)$ and $\text{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1747.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) \equiv \frac{\pi\,i}{2} + \text{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\, -\pi < \arg(z) \leq 0$$

01.25.27.1748.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.1749.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.1750.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \left(\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi \sqrt{-z^2}}{2 z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-z-1}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1751.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.1752.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.25.27.1753.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.1754.01

$$\sinh^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi \sqrt{-z-1}}{2 \sqrt{z+1}} - \frac{\sqrt{-z-1} \sqrt{-z}}{\sqrt{z+1}} \sqrt{\frac{1}{z}} \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-1+c z}{2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.25.27.1755.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2}}\right) = \frac{\pi i}{4} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.1756.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2}}\right) = -\frac{\pi i}{4} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) /; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.1757.01

$$\sinh^{-1}\left(\sqrt{\frac{-1-z}{2}}\right) = -\frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\frac{\pi}{2} + i\,\mathrm{csch}^{-1}\left(\frac{i}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right)$ and $\mathrm{csch}^{-1}\left(\frac{i}{z}\right)$

01.25.27.1758.01

$$\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right) = \frac{\pi i}{4} + \frac{1}{2}\mathrm{csch}^{-1}\left(\frac{i}{z}\right) /;\ 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.25.27.1759.01

$$\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\mathrm{csch}^{-1}\left(\frac{i}{z}\right) /;\ \mathrm{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.25.27.1760.01

$$\sinh^{-1}\left(\sqrt{\frac{z-1}{2}}\right) = -\frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(-i\,\mathrm{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right)$ and $\mathrm{csch}^{-1}\left(\sqrt{z}\right)$

01.25.27.1761.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = -\mathrm{csch}^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2} /;\ 0 < \arg(z) \leq \pi$$

01.25.27.1762.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = -\mathrm{csch}^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2} /;\ \mathrm{Im}(z) < 0$$

01.25.27.1763.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \mathrm{csch}^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2} /;\ (z \in \mathbb{R} \wedge z > 0)$$

01.25.27.1764.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\mathrm{csch}^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right)$ and $\mathrm{csch}^{-1}\left(\sqrt{z}\right)$

01.25.27.1765.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1766.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1767.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z > -1)$$

01.25.27.1768.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-z}}\right) = \frac{\pi\sqrt{z+1}}{2\sqrt{-z-1}} - \frac{\sqrt{z}}{\sqrt{-z-1}}\sqrt{-\frac{z+1}{z}}\operatorname{csch}^{-1}\left(\sqrt{z}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$

01.25.27.1769.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \operatorname{csch}^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2} /; 0 \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1770.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1771.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1772.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{z}}\right) = \sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}}\left(\operatorname{csch}^{-1}\left(\sqrt{z}\right) - \frac{\pi\sqrt{-z^2}}{2z} - \frac{\pi i}{2}\left(\sqrt{-\frac{1}{z}}\sqrt{-z} - 1\right)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1773.01

$$\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > -1$$

01.25.27.1774.01

$$\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \leq -1 \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1775.01

$$\sinh^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{2z}}\right) = \frac{i\pi\sqrt{z}}{4\sqrt{-i-z}}\sqrt{-\frac{i+z}{z}}\left(-\sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{1-iz}}\sqrt{1-iz} + 1\right) + \frac{1}{2}\sqrt{-i-z}\sqrt{\frac{i}{z}}\sqrt{z}\sqrt{\frac{1}{1-iz}}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1776.01

$$\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1$$

01.25.27.1777.01

$$\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) > 1 \bigvee \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.25.27.1778.01

$$\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) = \frac{i\pi\sqrt{2z}}{4\sqrt{i-z}}\sqrt{\frac{i-z}{2z}}\left(\sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{iz+1}}\sqrt{iz+1} + 1\right) + \frac{1}{2}\sqrt{i-z}\sqrt{-\frac{i}{z}}\sqrt{z}\sqrt{\frac{1}{iz+1}}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2z}}\right)$ and $\operatorname{csch}^{-1}(iz)$

01.25.27.1779.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(iz) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.1780.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(iz) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq 0$$

01.25.27.1781.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\sqrt{-z^2}}{4z}\left(\pi + 2i\operatorname{csch}^{-1}(iz)\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\operatorname{csch}^{-1}(i z)$

01.25.27.1782.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(i z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1783.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(i z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1784.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{-\frac{1}{z}}\sqrt{(1-z)z}\left(-i\operatorname{csch}^{-1}(i z) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1785.01

$$\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) > 0 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \ge -1$$

01.25.27.1786.01

$$\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) < -1 \bigvee -\frac{\pi}{2} \le \arg(z) \le 0$$

01.25.27.1787.01

$$\sinh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{-2z}}\right) = \frac{i\pi\sqrt{-2z}}{4\sqrt{i+z}}\sqrt{-\frac{i+z}{2z}}\left(1 - \sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{1-iz}}\sqrt{1-iz}\right) - \frac{1}{2}\sqrt{i+z}\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\sqrt{-z}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1788.01

$$\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \le 0 \lor \operatorname{Re}(z) \le 0 \land \operatorname{Im}(z) < 1$$

01.25.27.1789.01

$$\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \ge 1 \bigvee 0 < \arg(z) < \frac{\pi}{2}$$

01.25.27.1790.01

$$\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) = \frac{i\pi\sqrt{-z}}{4\sqrt{z-i}}\sqrt{\frac{i-z}{z}}\left(\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{iz+1}}\sqrt{iz+1}+1\right)-\frac{1}{2}\sqrt{z-i}\sqrt{\frac{1}{iz+1}}\sqrt{-\frac{i}{z}}\sqrt{-z}\,\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\operatorname{csch}^{-1}(iz)$

01.25.27.1791.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(iz)+\frac{\pi i}{4}\;/;\;\operatorname{Im}(z)>0\lor(z\in\mathbb{R}\land z<-1)$$

01.25.27.1792.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(iz)-\frac{\pi i}{4}\;/;\;-\pi<\arg(z)\leq 0\lor(z\in\mathbb{R}\land -1<z<0)$$

01.25.27.1793.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{\sqrt{-z-1}}{4\sqrt{z+1}}\left(2i\operatorname{csch}^{-1}(iz)+\pi\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\operatorname{csch}^{-1}(iz)$

01.25.27.1794.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(iz)-\frac{\pi i}{4}\;/;\;-\pi<\arg(z)\leq 0$$

01.25.27.1795.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(iz)+\frac{\pi i}{4}\;/;\;0<\arg(z)\leq\pi$$

01.25.27.1796.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{\sqrt{-z^2}}{z}\left(-\frac{1}{2}i\operatorname{csch}^{-1}(iz)+\frac{\pi}{4}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1797.01

$$\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right) = -\frac{\pi i}{4}+\frac{1}{2}\operatorname{csch}^{-1}(z)\;/;\;\operatorname{Re}(z)>0\lor(iz\in\mathbb{R}\land 0<iz<1)$$

01.25.27.1798.01

$$\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.25.27.1799.01

$$\sinh^{-1}\left(\sqrt{-\frac{i+z}{2z}}\right) = \frac{z}{2}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\operatorname{csch}^{-1}(z) - \frac{i\pi}{4}\left(\sqrt{\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-i z}}\sqrt{1-i z} - 1\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1800.01

$$\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.27.1801.01

$$\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.25.27.1802.01

$$\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) = \frac{i\pi}{4}\left(\sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{i z+1}}\sqrt{i z+1} + 1\right) + \frac{1}{2} z \sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{i z+1}}\sqrt{i z+1}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-1-z}{2z}}\right)$ and $\operatorname{csch}^{-1}(i z)$

01.25.27.1803.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(i z) + \frac{\pi i}{4} /; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.1804.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(i z) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.1805.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{i\sqrt{-z-1}\sqrt{-z}}{2\sqrt{z+1}}\sqrt{-\frac{1}{z}}\operatorname{csch}^{-1}(i z) + \frac{\pi}{4}\left(i - i\sqrt{-\frac{1}{z}}\sqrt{-z} - \frac{\sqrt{-z-1}}{\sqrt{z+1}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\operatorname{csch}^{-1}(i z)$

01.25.27.1806.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(i z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1807.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(i z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1808.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = -\frac{1}{2} z \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} \left(-i \operatorname{csch}^{-1}(i z) + \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}\left(\sqrt{-1-z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{-1-z^2}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1809.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1810.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1811.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1812.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1813.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}} \left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\frac{1}{z}\right)\right)$$

01.25.27.1814.01

$$\sinh^{-1}\left(\sqrt{-z^2-1}\right) = \sqrt{\frac{-i z-1}{1-i z}} \sqrt{\frac{1-i z}{-i z-1}} \left(\frac{\sqrt{z^2}}{z} \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \frac{\pi \sqrt{-z^4}}{2 z^2}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1815.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) > 0$$

01.25.27.1816.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) < 0$$

01.25.27.1817.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1818.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z > 0)$$

01.25.27.0066.02

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi \sqrt{-z^2}}{2 z} - \sqrt{-\frac{1}{z^2}} \sqrt{-z^2} \operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1819.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(z) \;/;\; 0 < \arg(z) \le \frac{\pi}{2}$$

01.25.27.1820.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1821.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.25.27.1822.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1823.01

$$\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi\sqrt{-z^2}}{2\sqrt{z^2}} - \frac{z\sqrt{-z^2}}{\sqrt{z^2}}\sqrt{-\frac{1}{z^2}}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1824.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1825.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1826.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0) \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1827.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1828.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) = \frac{\pi\sqrt{z^2+1}}{2\sqrt{-z^2-1}} - \frac{z\sqrt{z^2+1}}{\sqrt{-z^2-1}}\sqrt{-\frac{1}{z^2}}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1829.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(z) /; 0 \le \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1830.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1831.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1832.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1833.01

$$\sinh^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi \sqrt{-z^2 (z^2+1)}}{2\sqrt{-z^2-1}} \sqrt{-\frac{1}{z^2}} - \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}\sqrt{-z^2-1}} \operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(2 z \sqrt{1+z^2}\right)$

Involving $\sinh^{-1}\left(2 z \sqrt{1+z^2}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1834.01

$$\sinh^{-1}\left(2 z \sqrt{z^2+1}\right) = 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; |\arg(z)| \le \frac{\pi}{4} \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi$$

01.25.27.1835.01

$$\sinh^{-1}\left(2 z \sqrt{z^2+1}\right) = -\frac{\pi \sqrt{2 z^2+1} \sqrt{z^4+z^2}}{2\sqrt{z^2}\sqrt{-2 z^2-1}\sqrt{-z^2-1}} \left(\frac{\sqrt{-z^2}}{z} + i \sqrt{\frac{i}{z}} \sqrt{-i z} \sqrt{\frac{1}{1-i\sqrt{2}\, z}} \sqrt{1-i\sqrt{2}\, z} - i \sqrt{-\frac{i}{z}} \sqrt{i z} \sqrt{\frac{1}{\sqrt{2}\, i z+1}} \sqrt{\sqrt{2}\, i z+1} + \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{2\sqrt{2 z^2+1}\sqrt{z^4+z^2}}{\sqrt{z^2}\sqrt{-2 z^2-1}\sqrt{-z^2-1}} \operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1836.01

$$\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) = 2\operatorname{csch}^{-1}(z) \;/;\; |z| \geq \sqrt{2} \bigwedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1837.01

$$\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) = -2\operatorname{csch}^{-1}(z) \;/;\; |z| \geq \sqrt{2} \bigwedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.25.27.1838.01

$$\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) = \frac{\sqrt{-z^2-2}\sqrt{z^2+1}}{2\sqrt{1-iz}\,(-i+z)\left(-\frac{i}{z}\right)^{5/2}\sqrt{-(z^2+1)(z^2+2)}}\sqrt{\frac{i-z}{z}}\sqrt{\frac{z^2+1}{z^4}}\left(\pi\left(\sqrt{-\frac{1}{z^2}}\,z - \frac{z^3}{z^2+1}\sqrt{\frac{z^2+1}{z^4}}\sqrt{-\frac{z^2+1}{z^2}} + i\sqrt{\frac{-i\sqrt{2}+z}{z}}\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{z}{-i\sqrt{2}+z}} - i\sqrt{-iz}\sqrt{\frac{i}{z}}\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{z}{i\sqrt{2}+z}}\right) + 4\operatorname{csch}^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1+z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1+z^2}-1\right)/2}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1839.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1+z^2}-1}{2}}\right) = \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1840.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1+z^2}-1}{2}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1841.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1+z^2}-1}{2}}\right) = \frac{\sqrt{z^2}}{2z}\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1+z^2}-1}\Big/\sqrt{2z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1+z^2}-1}\Big/\sqrt{2z^2}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1842.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{z^2+1}-1}}{\sqrt{2z^2}}\right) = \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1+z^2}-1\right)\Big/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1+z^2}-1\right)\Big/\left(2z^2\right)}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1843.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1+z^2}-1}{2z^2}}\right) = \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sin^{-1}\left(\sqrt{\sqrt{z^2+1}-z}\Big/\sqrt{2z}\right)$

Involving $\sin^{-1}\left(\sqrt{\sqrt{z^2+1}-z}\Big/\sqrt{2z}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1844.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1) \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.25.27.1845.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = -\frac{\pi\,i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.25.27.1846.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = -\frac{\pi\,i}{2} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1847.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) = \frac{\pi\,i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.25.27.1848.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2+1}-z}}{\sqrt{2z}}\right) =$$

$$\frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2} + \sqrt{-z} - i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)\right) + \frac{\sqrt{-i\,z-1}\,\sqrt{i\,z-1}}{2\sqrt{z}}\sqrt{\frac{1}{z}}\,\sqrt{\frac{z^2}{z^2+1}}\operatorname{csch}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2+1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2+1}-z\right)/(2z)}\right)$ and $\operatorname{csch}^{-1}(z)$

01.25.27.1849.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.25.27.1850.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right) == -\frac{\pi i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.25.27.1851.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right) == \frac{\pi i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1) \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.25.27.1852.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right) == -\frac{1}{2}\operatorname{csch}^{-1}(z) /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.27.1853.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2+1}-z}{2z}}\right) ==$$

$$\frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2} + \sqrt{-z} - 2 i \sqrt{\frac{1}{z}}\, z - i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 3\right)\right) + \frac{i\sqrt{(-i+z)^2}}{2\sqrt{z^2+1}}\sqrt{\frac{z}{i-z}}\sqrt{\frac{i+z}{z}}\operatorname{csch}^{-1}(z)$$

Involving sech^{-1}

Involving $\sinh^{-1}(z)$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$

01.25.27.1854.01

$$\sinh^{-1}(z) == \operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.25.27.1855.01

$$\sinh^{-1}(z) == -\operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.25.27.1856.01

$$\sinh^{-1}(z) == -\frac{i\sqrt{i z+1}}{\sqrt{-i z-1}}\operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2}$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(-\frac{i}{z}\right)$

01.25.27.1857.01

$$\sinh^{-1}(z) == \operatorname{sech}^{-1}\left(-\frac{i}{z}\right) - \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.25.27.1858.01

$$\sinh^{-1}(z) = -\operatorname{sech}^{-1}\left(-\frac{i}{z}\right) - \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1859.01

$$\sinh^{-1}(z) = i\left(\frac{\sqrt{1 - i z}}{\sqrt{i z - 1}} \operatorname{sech}^{-1}\left(-\frac{i}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{1}{1+2z^2}\right)$

01.25.27.1860.01

$$\sinh^{-1}(z) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{1 + 2 z^2}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1861.01

$$\sinh^{-1}(z) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{1 + 2 z^2}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1862.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}}{2 z} \operatorname{sech}^{-1}\left(\frac{1}{1 + 2 z^2}\right)$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+i z}}\right)$

01.25.27.1863.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 + i z}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1864.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 + i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1865.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 i \sqrt{\frac{1}{1 - i z}} \sqrt{\frac{i}{z}} \sqrt{z (i + z)} \operatorname{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{i z + 1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2}{1+i z}}\right)$

01.25.27.1866.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2}{1 + i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1867.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2}{1 + i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1868.01

$$\sinh^{-1}(z) = \frac{3\pi i}{2} + 2\,\text{sech}^{-1}\left(\sqrt{\frac{2}{1 + i z}}\right) /;\ (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1869.01

$$\sinh^{-1}(z) = \left(\frac{1}{2} - \sqrt{\frac{1}{i z + 1}}\ \sqrt{i z + 1}\right) \pi i - 2 i \sqrt{\frac{1}{1 - i z}}\ \sqrt{\frac{i}{z}}\ \sqrt{z (i + z)}\ \text{sech}^{-1}\left(\sqrt{\frac{2}{i z + 1}}\right)$$

Involving $\sinh^{-1}(z)$ and $\text{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - i z}}\right)$

01.25.27.1870.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\,\text{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - i z}}\right) /;\ \text{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1871.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\,\text{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - i z}}\right) /;\ \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1872.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2 i \sqrt{\frac{1}{i z + 1}}\ \sqrt{-\frac{i}{z}}\ \sqrt{z (-i + z)}\ \text{sech}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\text{sech}^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right)$

01.25.27.1873.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + 2\,\text{sech}^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) /;\ \text{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1874.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - 2\,\text{sech}^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) /;\ \text{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.25.27.1875.01

$$\sinh^{-1}(z) = -\frac{3\pi i}{2} - 2\,\text{sech}^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right) /;\ (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1876.01

$$\sinh^{-1}(z) = \left(\sqrt{\frac{1}{1 - i z}}\ \sqrt{1 - i z} - \frac{1}{2}\right) \pi i + 2 i \sqrt{\frac{1}{i z + 1}}\ \sqrt{-\frac{i}{z}}\ \sqrt{z (-i + z)}\ \text{sech}^{-1}\left(\sqrt{\frac{2}{1 - i z}}\right)$$

Involving $\sinh^{-1}(z)$ and $\text{sech}^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$

01.25.27.1877.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1878.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1879.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1880.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1881.01

$$\sinh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(\frac{\sqrt{1 - \sqrt{-z^2}}}{\sqrt{\sqrt{-z^2} - 1}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) - \frac{\pi}{2} \right)$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$

01.25.27.1882.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1883.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1884.01

$$\sinh^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1885.01

$$\sinh^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.25.27.1886.01

$$\sinh^{-1}(z) = \frac{\sqrt{1-\sqrt{-z^2}}\,\sqrt{-z^2}}{\sqrt{\sqrt{-z^2}-1}\,z}\,\operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) + \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$

01.25.27.1887.01

$$\sinh^{-1}(z) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.25.27.1888.01

$$\sinh^{-1}(z) = -\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.25.27.1889.01

$$\sinh^{-1}(z) = \frac{\sqrt{z^2}}{z}\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right)$

01.25.27.1890.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1891.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) /; -\frac{\pi}{2} < \arg(z) \le 0$$

01.25.27.1892.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) /; \frac{3\pi}{4} < \arg(z) \le 0$$

01.25.27.1893.01

$$\sinh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) /; -\pi < \arg(z) \le -\frac{3\pi}{4}$$

01.25.27.1894.01

$$\sinh^{-1}(z) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) - \frac{\pi\sqrt{-z}}{4\sqrt{z}} /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

Involving $\sinh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(-\frac{i}{2z\sqrt{1+z^2}}\right)$

01.25.27.1895.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(-\frac{i}{2z\sqrt{1+z^2}}\right) /; \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1896.01

$$\sinh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(-\frac{i}{2z\sqrt{1+z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{4}$$

01.25.27.1897.01

$$\sinh^{-1}(z) = \frac{1}{4}\pi\left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-i z}\sqrt{1-i\sqrt{2}\,z}\sqrt{\frac{1}{1-i\sqrt{2}\,z}} + i\sqrt{-\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{\sqrt{2}\,i z+1}}\sqrt{\sqrt{2}\,i z+1} + \frac{i\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}}{\sqrt{2z^2+1}\sqrt{z^4+z^2}} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{i\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}\sqrt{1-2 i z\sqrt{z^2+1}}}{2\sqrt{2z^2+1}\sqrt{z^4+z^2}\sqrt{2 i z\sqrt{z^2+1}-1}}\operatorname{sech}^{-1}\left(-\frac{i}{2z\sqrt{1+z^2}}\right)$$

Involving $\sinh^{-1}(\sqrt{z})$

Involving $\sinh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.25.27.1898.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1899.01

$$\sinh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; -\pi < \arg(z) \le 0$$

01.25.27.1900.01

$$\sinh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1901.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\sinh^{-1}\left(\sqrt{z}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.25.27.1902.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1903.01

$$\sinh^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.25.27.1904.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1905.01

$$\sinh^{-1}\left(\sqrt{z}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{1}{2}\pi\sqrt{-\frac{1}{z}} \sqrt{z}$$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{-z}\right)$

01.25.27.1906.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1907.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-z}\right) /; -\pi < \arg(z) \leq 0$$

01.25.27.1908.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1909.01

$$\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \operatorname{sech}^{-1}\left(\sqrt{-z}\right) + \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\sinh^{-1}\left(\sqrt{c\,z^2}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$

01.25.27.1910.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.25.27.1911.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \operatorname{sech}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1912.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -\operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.25.27.1913.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \sqrt{\frac{z-i}{z}}\,\sqrt{\frac{z}{z-i}}\,\operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i \sqrt{z^2}}{2 z}$$

Involving $\sinh^{-1}\left(\sqrt{z^2}\right)$ and $\operatorname{sech}^{-1}\left(-\frac{i}{z}\right)$

01.25.27.1914.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \operatorname{sech}^{-1}\left(-\frac{i}{z}\right) - \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1915.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \operatorname{sech}^{-1}\left(-\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.25.27.1916.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = -\operatorname{sech}^{-1}\left(-\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.25.27.1917.01

$$\sinh^{-1}\left(\sqrt{z^2}\right) = \sqrt{\frac{z+i}{z}}\,\sqrt{\frac{z}{z+i}}\,\operatorname{sech}^{-1}\left(-\frac{i}{z}\right) - \frac{\pi i \sqrt{z^2}}{2 z}$$

Involving $\sinh^{-1}\left(\sqrt{-z^2}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1918.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi$$

01.25.27.1919.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1920.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1921.01

$$\sinh^{-1}\left(\sqrt{-z^2}\right) = \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi \sqrt{-z^2}}{2 z}$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.25.27.1922.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{z-1}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.25.27.1923.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.25.27.1924.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1925.01

$$\sinh^{-1}\left(\sqrt{z-1}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1+c z}}{\sqrt{2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1926.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1927.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1928.01

$$\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land -1 < z < 1)$$

01.25.27.1929.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2}}\right) = \frac{\sqrt{z+1}\,\sqrt{1-z}}{2\sqrt{-z-1}\,\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{z+1}}{2\sqrt{-z-1}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1930.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{z}\right)$

01.25.27.1931.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) /; |\arg(z)| < \pi$$

01.25.27.1932.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{z}\right) - \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0070.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right)\sqrt{\frac{1}{z}}\,\sqrt{z} + \frac{\pi i}{2}\left(\sqrt{z}\,\sqrt{\frac{1}{z}} - 1\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{z}\right)$

01.25.27.1933.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{z}\right) /; z \notin (-\infty, 1)$$

01.25.27.1934.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1935.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1936.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\sqrt{z-1}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2}\left(1 - \sqrt{z}\sqrt{\frac{1}{z}}\right)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{z}\right)$

01.25.27.1937.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) /; |\arg(z)| < \pi$$

01.25.27.1938.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.25.27.0069.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2}\left(\sqrt{z}\sqrt{\frac{1}{z}} - 1\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1939.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.25.27.1940.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} /; (i\, m(z) \in \mathbb{R} \land i\, m(z) < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1941.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.25.27.1942.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.25.27.1943.01

$$\sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \frac{1}{2}\sqrt{z-1}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1944.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) /; |\arg(z)| < \pi$$

01.25.27.1945.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) /; (z \in \mathbb{R} \wedge z < 0)$$

01.25.27.0072.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{2z}}\right) = \frac{1}{2}\sqrt{z}\sqrt{\frac{1}{z}}\operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{-2z}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1946.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.25.27.1947.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.25.27.1948.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.25.27.1949.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} \text{ /; } (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1950.01

$$\sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) = \frac{\sqrt{-z-1}\,\sqrt{z-1}\,\sqrt{z}}{2\sqrt{1-z^2}}\sqrt{\frac{1}{z}}\operatorname{sech}^{-1}(z) - \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}}$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.25.27.1951.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) \text{ /; } z \notin (-\infty, 1)$$

01.25.27.1952.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) \text{ /; } (z \in \mathbb{R} \land z < 1)$$

01.25.27.1953.01

$$\sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right) = -\frac{\sqrt{z-1}}{2}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{a-z}{2z}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1954.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} \text{ /; } \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1955.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} \text{ /; } \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1956.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} \text{ /; } (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < -1)$$

01.25.27.1957.01

$$\sinh^{-1}\left(\sqrt{\frac{-z-1}{2z}}\right) = \frac{\pi}{2}\left(z\sqrt{-\frac{1}{z^2}} - i\sqrt{z+1}\sqrt{\frac{1}{z+1}} + i\right) + \frac{1}{2}\sqrt{\frac{z+1}{1-z}}\sqrt{\frac{1-z}{z+1}}\operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.0071.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(\sqrt{z^2-1}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1958.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.25.27.1959.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.25.27.1960.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.25.27.1961.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1962.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) > 0$$

01.25.27.1963.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) + 2 i \pi /; \operatorname{Im}(z) < 0 \land \operatorname{Re}(z) \leq 0$$

01.25.27.1964.01

$$\sinh^{-1}\left(\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{z}{\sqrt{z-1}\,\sqrt{z+1}}\sqrt{\frac{z^2-1}{z^2}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.0068.02

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \operatorname{sech}^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.25.27.1965.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\operatorname{sech}^{-1}(z) - \pi i \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.25.27.1966.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\operatorname{sech}^{-1}(z) + \pi i \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1967.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \operatorname{sech}^{-1}(z) - \pi i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1968.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi \sqrt{z^2 - z^4}}{2 z \sqrt{z^2 - 1}} \left(1 - \sqrt{\frac{1}{z^2}}\; z\right) + \sqrt{\frac{1}{z+1}}\; \sqrt{z+1}\; z \sqrt{\frac{1}{z^2}}\; \operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1969.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \operatorname{sech}^{-1}(z) \;/;\; \operatorname{Re}(z) > 0$$

01.25.27.1970.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \operatorname{sech}^{-1}(z) + \pi i \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1971.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi i \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1972.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\operatorname{sech}^{-1}(z) + \pi\, i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1973.01

$$\sinh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi \sqrt{1-z^2}}{2\sqrt{z^2-1}} \left(1 - \sqrt{\frac{1}{z^2}}\, z\right) + \frac{\sqrt{z-1}\; z^{3/2} \sqrt{z+1}}{\sqrt{z^2-1}} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{z^2}}\, \operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1974.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\operatorname{sech}^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1975.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \operatorname{sech}^{-1}(z) \;/;\; (z \in \mathbb{R} \land 0 < z < 1) \lor (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.25.27.1976.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\operatorname{sech}^{-1}(z) - \pi\, i \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.1977.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\operatorname{sech}^{-1}(z) + \pi\, i \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.1978.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \operatorname{sech}^{-1}(z) + \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.25.27.1979.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi\, i \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.1980.01

$$\sinh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi \sqrt{-z^2}}{2\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right) + \frac{\sqrt{1-z}\, \sqrt{-z}\, \sqrt{z^2}}{\sqrt{z-1}} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{z^2}}\, \operatorname{sech}^{-1}(z)$$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1981.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \operatorname{sech}^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.25.27.1982.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \operatorname{sech}^{-1}(z) + \pi\, i \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.25.27.1983.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi\, i \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.25.27.1984.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\operatorname{sech}^{-1}(z) + \pi\, i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.25.27.1985.01

$$\sinh^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\sqrt{z+1}}{\sqrt{1-\frac{1}{z^2}}} \sqrt{\frac{z-1}{z^2}} \operatorname{sech}^{-1}(z) - \frac{\pi \sqrt{z^2-z^4}}{2\sqrt{z^2-1}} \sqrt{\frac{1}{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right)$$

Involving $\sinh^{-1}\left(2\, z \sqrt{z^2-1}\right)$

Involving $\sinh^{-1}\left(2\, z \sqrt{z^2-1}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1986.01

$$\sinh^{-1}\left(2\, z \sqrt{z^2-1}\right) = \frac{2\, z^2}{\sqrt{-z^4}} \left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right) \;/;\; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\,\pi}{4}$$

01.25.27.1987.01

$$\sinh^{-1}\left(2z\sqrt{z^2-1}\right) = \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}z+1}}\sqrt{\sqrt{2}z+1} + \sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}z}}\sqrt{1-\sqrt{2}z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right) - \frac{2\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$

Involving $\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.1988.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\left(\frac{\pi}{2} - \frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\operatorname{sech}^{-1}(z)\right) /;\ |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.25.27.1989.01

$$\sinh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2} \left(\pi\left(\frac{\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}z^3}{1-z^2} + \sqrt{\frac{1}{z^2}}z - \sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}} - 2\right) + 4\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\operatorname{sech}^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{1-z^2}-1\right)/2}\right)$ and $\text{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1990.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{1}{2}\,\text{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\, i}{4} \;/;\; 0 < \arg(z) \le \pi$$

01.25.27.1991.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\pi\, i}{4} + \frac{1}{2}\,\text{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; \text{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.25.27.1992.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\pi\, i}{4} - \frac{1}{2}\,\text{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.25.27.1993.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2}}\right) = \frac{\sqrt{-z^2}}{2\,z}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\,\text{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\,/\sqrt{2\,z^2}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\sqrt{1-z^2}-1}\,/\sqrt{2\,z^2}\right)$ and $\text{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1994.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2\,z^2}}\right) = \frac{1}{2}\,\text{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\, i}{4} \;/;\; 0 < \arg(z) \le \frac{\pi}{2}$$

01.25.27.1995.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2\,z^2}}\right) = \frac{\pi\, i}{4} + \frac{1}{2}\,\text{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.25.27.1996.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right)=\frac{\pi i}{4}-\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)/;\ (z\in\mathbb{R}\land 0<z<1)$$

01.25.27.1997.01

$$\sinh^{-1}\left(\frac{z\sqrt{\sqrt{1-z^2}-1}}{\sqrt{2z^2}}\right)=\frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2}-\frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)/\left(2z^2\right)}\right)$

Involving $\sinh^{-1}\left(z\sqrt{\left(\sqrt{1-z^2}-1\right)/\left(2z^2\right)}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.25.27.1998.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4}/;\ 0<\arg(z)<\frac{\pi}{2}$$

01.25.27.1999.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}/;\ -\frac{\pi}{2}\leq\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.25.27.2000.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=-\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}/;\ \frac{\pi}{2}\leq\arg(z)\leq\pi\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.25.27.2001.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=-\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4}/;\ -\pi<\arg(z)<-\frac{\pi}{2}$$

01.25.27.2002.01

$$\sinh^{-1}\left(z\sqrt{\frac{\sqrt{1-z^2}-1}{2z^2}}\right)=\frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\left(\frac{\pi}{2}-\frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z} \Big/ \sqrt{2z}\right)$

Involving $\sinh^{-1}\left(\sqrt{\sqrt{z^2-1}-z} \Big/ \sqrt{2z}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.2003.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.25.27.2004.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.25.27.2005.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{3\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.25.27.2006.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{3\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.25.27.2007.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.25.27.2008.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.25.27.2009.01

$$\sinh^{-1}\left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1-\frac{i\sqrt{-iz}}{\sqrt{iz}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{iz}\sqrt{z}\left(\frac{\pi}{2}-\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\operatorname{sech}^{-1}(z)\right)$$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$

Involving $\sinh^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/(2z)}\right)$ and $\operatorname{sech}^{-1}(z)$

01.25.27.2010.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4}+\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; 0<\arg(z)\le\frac{\pi}{2} \bigvee (z\in\mathbb{R}\land 0<z<1) \bigvee (iz\in\mathbb{R}\land iz>0)$$

01.25.27.2011.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{\pi i}{4}+\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; -\frac{\pi}{2}<\arg(z)<0$$

01.25.27.2012.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{3\pi i}{4}+\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; \frac{\pi}{2}<\arg(z)<\pi$$

01.25.27.2013.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = -\frac{3\pi i}{4}+\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; -\pi<\arg(z)<-\frac{\pi}{2} \bigvee (z\in\mathbb{R}\land -1<z<0)$$

01.25.27.2014.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{3\pi i}{4}-\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z\in\mathbb{R}\land z<-1)$$

01.25.27.2015.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2z}}\right) = \frac{\pi i}{4}-\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z\in\mathbb{R}\land z>1)$$

01.25.27.2016.01

$$\sinh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\,z}}\right) = \frac{\pi}{4\,z}\left(\sqrt{\frac{i}{z}}\,\sqrt{-\frac{1}{z}}\,\sqrt{-i\,z}\,z^{3/2}+3\,i\left(\sqrt{1+\frac{1}{z}}\,\sqrt{\frac{z}{z+1}}-1\right)z-\sqrt{-z^2}\left(1+i\,\sqrt{\frac{i}{z}}\,\sqrt{i\,z}\right)\right)-$$
$$\frac{\sqrt{z-1}\,z^{3/2}}{2\,\sqrt{-z\,(z+1)}}\,\sqrt{\frac{z+1}{z-1}}\,\sqrt{-\frac{1}{z^2}}\,\operatorname{sech}^{-1}(z)$$

Inequalities

01.25.29.0001.01

$$\sinh^{-1}(x) \geq 0 \;/;\; x \geq 0 \land x \in \mathbb{R}$$

Zeros

01.25.30.0001.01

$$\sinh^{-1}(z) == 0 \;/;\; z == 0$$

History

– J. Houel (1878)

The function $\sinh^{-1}$ is encountered often in mathematics and the natural sciences.

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