MeijerG

Notations

Traditional name

Meijer G-function

Traditional notation

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$$

Mathematica StandardForm notation

MeijerG[{{a_1, …, a_n}, {a_{n+1}, .., a_p}}, {{b_1, …, b_m}, {b_{m+1}, …, b_q}}, z]

Primary definition

07.34.02.0001.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \frac{1}{2\pi i}\int_{\mathcal{L}} \frac{\left(\prod_{k=1}^{m}\Gamma(s+b_k)\right)\prod_{k=1}^{n}\Gamma(1-a_k-s)}{\left(\prod_{k=n+1}^{p}\Gamma(s+a_k)\right)\prod_{k=m+1}^{q}\Gamma(1-b_k-s)} z^{-s}\, ds \,/;$$

$$m \in \mathbb{N} \land n \in \mathbb{N} \land p \in \mathbb{N} \land q \in \mathbb{N} \land m \leq q \land n \leq p$$

The infinite contour of integration $\mathcal{L}$ separates the poles of $\Gamma(1-a_k-s)$at $s = 1-a_k+j$, $j \in \mathbb{N}$ from the poles of $\Gamma(b_i+s)$ at $s = -b_i-l$, $l \in \mathbb{N}$. Such a contour always exists in the cases $a_k - b_i - 1 \notin \mathbb{N}$.

There are three possibilities for the contour $\mathcal{L}$:

(i) $\mathcal{L}$ runs from γ-$i\,\infty$ to γ+$i\,\infty$ (where $\text{Im}(\gamma) = 0$) so that all poles of $\Gamma(b_i+s)$, $i = 1, \ldots, m$, are to the left, and all the poles of $\Gamma(1-a_i-s)$, $i = 1, \ldots, n$, to the right, of $\mathcal{L}$.
This contour can be a straight line $(\gamma - i\,\infty,\ \gamma + i\,\infty)$ if $\text{Re}(b_i - a_k) > -1$ (then $-\text{Re}(b_i) < \gamma < 1 - \text{Re}(a_k)$). (In this case the integral converges if $p + q < 2(m+n)$, $|\text{Arg}(z)| < \left(m+n-\frac{p+q}{2}\right)\pi$. If $m+n-\frac{p+q}{2} = 0$, then z must be real and positive and additional condition $(q-p)\gamma + \text{Re}(\mu) < 0$, $\mu = \sum_{l=1}^{q} b_l - \sum_{k=1}^{p} a_k + \frac{p-q}{2} + 1$, should be added.)

(ii) $\mathcal{L}$ is a left loop, starting and ending at -∞ and encircling all poles of $\Gamma(b_i+s)$, $i = 1, \ldots, m$, once in the positive direction, but none of the poles of $\Gamma(1-a_i-s)$, $i = 1, \ldots, n$.
(In this case the integral converges if $q \geq 1$ and either $q > p$ or $q = p$ and $|z| < 1$ or $q = p$ and $|z| = 1$and $m+n-\frac{p+q}{2} \geq 0$ and $\text{Re}(\mu) < 0$.)

(iii) $\mathcal{L}$ is a right loop, starting and ending at $+\infty$ and encircling all poles of $\Gamma(1-a_i-s)$, $i=1, \ldots, n$, once in the negative direction, but none of the poles of $\Gamma(b_i+s)$, $i=1, \ldots, m$.
(In this case the integral converges if $p \geq 1$ and either $p > q$ or $p = q$ and $|z| > 1$ or $q = p$ and $|z| == 1$and $m + n - \frac{p+q}{2} \geq 0$ and $\operatorname{Re}(\mu) < 0$.)

Special notations for this file:

07.34.02.0002.01

$$\hat{\Phi}(z, s, a) == \sum_{k=0}^{\infty} \frac{z^k}{(a+k)^s} /; |z| < 1 \lor (|z| == 1 \land \operatorname{Re}(s) > 1)$$

07.34.02.0003.01

$$\hat{\zeta}(s, a) == \sum_{k=0}^{\infty} \frac{1}{(a+k)^s} /; \operatorname{Re}(s) > 1$$

07.34.02.0004.01

$$c^* == m + n - \frac{p+q}{2}$$

07.34.02.0005.01

$$\mu == \sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j + \frac{p-q}{2} + 1$$

07.34.02.0006.01

$$\mathbb{CC} == (\mathbb{C}_1 \lor \mathbb{C}_2 \lor \mathbb{C}_3 \lor \mathbb{C}_4 \lor \mathbb{C}_5 \lor \mathbb{C}_6 \lor \mathbb{C}_7 \lor \mathbb{C}_8 \lor \mathbb{C}_9 \lor \mathbb{C}_{10} \lor \mathbb{C}_{11} \lor \mathbb{C}_{12} \lor \mathbb{C}_{13} \lor \mathbb{C}_{14} \lor \mathbb{C}_{15} \lor \mathbb{C}_{16} \lor \mathbb{C}_{17} \lor \mathbb{C}_{18} \lor \mathbb{C}_{19} \lor \mathbb{C}_{20} \lor \mathbb{C}_{21} \lor \mathbb{C}_{22} \lor \mathbb{C}_{23} \lor \mathbb{C}_{24} \lor \mathbb{C}_{25} \lor \mathbb{C}_{26} \lor \mathbb{C}_{27} \lor \mathbb{C}_{28} \lor \mathbb{C}_{29} \lor \mathbb{C}_{30} \lor \mathbb{C}_{31} \lor \mathbb{C}_{32} \lor \mathbb{C}_{33} \lor \mathbb{C}_{34} \lor \mathbb{C}_{35})$$

where $\mathbb{C}_j$, $1 \leq j \leq 39$, are described in subsubsection Generalization of classical Meijer's integral from two G functions.

Specific values

Specialized values

Cases with arbitrary $\{m, n, p, q\}$

Case with fixed $a_1, \ldots, a_p$

07.34.03.0001.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{q-1}, a_1 \end{matrix}\right) == G_{p-1,q-1}^{m,n-1}\left(z \,\middle|\, \begin{matrix} a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{q-1} \end{matrix}\right)$$

07.34.03.0002.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_{m-1}, a_p, b_{m+1}, \ldots, b_q \end{matrix}\right) == G_{p-1,q-1}^{m-1,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{p-1} \\ b_1, \ldots, b_{m-1}, b_{m+1}, \ldots, b_q \end{matrix}\right)$$

Case $\{m, n, p, q\} = \{0, n, n, n\}$

07.34.03.0003.01

$$G_{n,n}^{0,n}\left(z \;\middle|\; \begin{matrix} a, \ldots, a \\ a-1, \ldots, a-1 \end{matrix}\right) = \frac{(-1)^{n-1}}{(n-1)!} z^{a-1} \log^{n-1}\left(\frac{1}{z}\right) \theta(|z|-1)$$

Case $\{m, n, p, q\} = \{1, 0, 0, q\}$

07.34.03.0004.01

$$G_{0,q}^{1,0}\left(z \;\middle|\; b, b+\tfrac{1}{q}, b+\tfrac{2}{q}, \ldots, b+\tfrac{q-1}{q}\right) = \frac{z^b}{(2\pi)^{(q-1)/2}\sqrt{q}} \sum_{k=0}^{q-1} \exp\left(q\, e^{\frac{2\pi i k}{q}} (-z)^{\frac{1}{q}}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 1, q\}$

07.34.03.0005.01

$$G_{1,q+1}^{1,1}\left(z \;\middle|\; \begin{matrix} a \\ a, a-\frac{m}{q}, a+\frac{1-m}{q}, \ldots, a+\frac{q-1-m}{q} \end{matrix}\right) = \frac{(2\pi)^{\frac{1-q}{2}} z^a (-z)^{-\frac{m}{q}}}{\sqrt{q}} \left(\sum_{k=0}^{q-1} e^{-\frac{2\pi i k m}{q}} \exp\left(q\, e^{\frac{2\pi i k}{q}} (-z)^{1/q}\right) - q^{m+1} \sum_{k=1}^{\left\lfloor \frac{m}{q} \right\rfloor} \frac{(-z)^{\frac{m}{q}-k} q^{-qk}}{(m-qk)!}\right) /; m \in \mathbb{N}$$

Case $\{m, n, p, q\} = \{1, p, p, q\}$

07.34.03.0006.01

$$G_{p,q}^{1,p}\left(z \;\middle|\; \begin{matrix} a_1, \ldots, a_p \\ b_1, b_2, \ldots, b_q \end{matrix}\right) = \frac{\prod_{k=1}^{p} \Gamma(b_1-a_k+1)}{\prod_{k=2}^{q} \Gamma(b_1-b_k+1)} z^{b_1} {}_pF_{q-1}(b_1-a_1+1, \ldots, b_1-a_p+1; b_1-b_2+1, \ldots, b_1-b_q+1; -z) /; p \le q$$

07.34.03.0007.01

$$G_{p,q}^{1,p}\left(z \;\middle|\; \begin{matrix} a_1, \ldots, a_p \\ b_1, b_2, \ldots, b_q \end{matrix}\right) = \left(\prod_{k=1}^{p} \Gamma(b_1-a_k+1)\right) z^{b_1} {}_p\tilde{F}_{q-1}(b_1-a_1+1, \ldots, b_1-a_p+1; b_1-b_2+1, \ldots, b_1-b_q+1; -z) /; p \le q$$

07.34.03.0008.01

$$G_{p,q+1}^{1,p}\left(z \;\middle|\; \begin{matrix} a_1, \ldots, a_p \\ 0, a_1-1, \ldots, a_n-1, b_{n+1}, \ldots, b_q \end{matrix}\right) = \frac{\prod_{j=n+1}^{p} \Gamma(1-a_j)}{\prod_{j=n+1}^{q} \Gamma(1-b_j)} \sum_{k=1}^{n} \frac{1}{1-a_k} {}_{p-n+1}F_{q-n+1}(1-a_k, 1-a_{n+1}, \ldots, 1-a_p; 2-a_k, 1-b_{n+1}, \ldots, 1-b_q; -z) \prod_{\substack{j=1 \\ j\ne k}}^{n} \frac{1}{a_k-a_j} /; n \le q$$

07.34.03.0009.01

$$G_{p,q+1}^{1,p}\left(z \;\middle|\; \begin{matrix} a_1, \ldots, a_p \\ 0, a_1-m_1, \ldots, a_n-m_n, b_{n+1}, \ldots, b_q \end{matrix}\right) = \frac{\prod_{j=n+1}^{p} \Gamma(1-a_j)}{\left(\prod_{j=1}^{n} (m_j-1)!\right) \prod_{j=n+1}^{q} \Gamma(1-b_j)} \sum_{k=1}^{n} \sum_{j_1=0}^{m_1-1} \cdots \sum_{j_n=0}^{m_n-1} \frac{1}{j_k-a_k+1} \prod_{l=1}^{n} \frac{(1-m_l)_{j_l}}{j_l!} \prod_{\substack{j=1 \\ j\ne k}}^{n} \frac{1}{a_k-a_i+j_i-j_k} \; {}_{p-n+1}F_{q-n+1}(j_k-a_k+1, 1-a_{n+1}, \ldots, 1-a_p; j_k-a_k+2, 1-b_{n+1}, \ldots, 1-b_q; -z) /; m_n \in \mathbb{N}^+ \land n \le q$$

07.34.03.0010.01

$$G_{p,q+1}^{1,p}\left(z \left| \begin{array}{c} a, b, a_3, \ldots, a_p \\ 0, a-1, b-1, b_3, \ldots, b_q \end{array} \right.\right) = \frac{\prod_{j=3}^{p} \Gamma(a_j)}{(1-a)(1-b)(b-a)\prod_{j=3}^{q}\Gamma(b_j)} \left((1-a)\, {}_{p-1}F_{q-1}(1-b, 1-a_3, \ldots, 1-a_p; 2-b, 1-b_3, \ldots, 1-b_q; -z) - (1-b)\, {}_{p-1}F_{q-1}(1-a, 1-a_3, \ldots, 1-a_p; 2-a, 1-b_3, \ldots, 1-b_q; -z)\right) /; a \neq b$$

07.34.03.0011.01

$$G_{p,q+1}^{1,p}\left(z \left| \begin{array}{c} 0, a_2, \ldots, a_p \\ 0, -n, b_2, \ldots, b_q \end{array} \right.\right) = \frac{(-1)^n \prod_{j=2}^{p} \Gamma(1-n-a_j)}{z^n \prod_{j=2}^{q}\Gamma(1-n-b_j)} \left({}_{p-1}F_{q-1}(1-n-a_2, \ldots, 1-n-a_p; 1-n-b_2, \ldots, 1-n-b_q; -z) - \sum_{k=0}^{n-1} \frac{(-1)^k \prod_{j=2}^{p}(1-n-a_j)_k\, z^k}{\left(\prod_{j=2}^{q}(1-n-b_j)_k\right) k!}\right)$$

07.34.03.0012.01

$$G_{p,q+1}^{1,p}\left(z \left| \begin{array}{c} 0, a_2, \ldots, a_p \\ 0, -1, b_2, \ldots, b_q \end{array} \right.\right) = \frac{\prod_{j=2}^{p} \Gamma(-a_j)}{z \prod_{j=2}^{q}\Gamma(-b_j)} \left(1 - {}_{p-1}F_{q-1}(-a_2, \ldots, -a_p; -b_2, \ldots, -b_q; -z)\right)$$

07.34.03.0013.01

$$G_{p,p+1}^{1,p}\left(z \left| \begin{array}{c} 0, a_2, \ldots, a_p \\ 0, -2, b_2, \ldots, b_q \end{array} \right.\right) = \frac{\left(\prod_{j=2}^{p} \Gamma(-a_j-1)\right)}{z^2 \prod_{j=2}^{q}\Gamma(-b_j-1)} \left({}_{p-1}F_{q-1}(-a_2-1, \ldots, -a_p-1; -b_2-1, \ldots, -b_q-1; -z) + \frac{(-1)^{p-q}\prod_{j=2}^{p}(a_j+1)}{\prod_{j=2}^{q}(b_j+1)} z - 1\right)$$

07.34.03.0014.01

$$G_{p,q+1}^{1,p}\left(z \left| \begin{array}{c} a, a_2, \ldots, a_p \\ 0, a+m, b_2, \ldots, b_q \end{array} \right.\right) = \Gamma(1-a) \sum_{k=0}^{m} \binom{m}{k} \frac{1}{\Gamma(k-a-m+1)\prod_{j=2}^{q}\Gamma(k-b_j+1)} \left(\prod_{j=2}^{p} \Gamma(k-a_j+1)\right) (-z)^k\, {}_{p-1}F_{q-1}(k-a_2+1, \ldots, k-a_p+1; k-b_2+1, \ldots, k-b_q+1; -z)$$

07.34.03.0015.01

$$G_{p,q+1}^{1,p}\left(z \left| \begin{array}{c} a, a_2, \ldots, a_p \\ 0, a+1, b_2, \ldots, b_q \end{array} \right.\right) = -\frac{\prod_{j=2}^{p} \Gamma(1-a_j)}{\prod_{j=2}^{q}\Gamma(1-b_j)} \left(\frac{z\prod_{j=2}^{p}(1-a_j)}{\prod_{j=2}^{q}(1-b_j)}\, {}_{p+1}F_{q+1}(2-a_2, \ldots, 2-a_p; 2-b_2, \ldots, 2-b_q; -z) + a\, {}_3F_3(1-a_2, \ldots, 1-a_p; 1-b_2, \ldots, 1-b_q; -z)\right)$$

07.34.03.0016.01

$$G_{p\,n,q\,n+n}^{1,p\,n}\left(z \,\middle|\, \begin{matrix} 0, \frac{a_1-m}{n}, \frac{a_1-m+1}{n}, \ldots, \frac{a_1-m+n-1}{n}, \ldots, \frac{a_p-m}{n}, \frac{a_p-m+1}{n}, \ldots, \frac{a_p-m+n-1}{n} \\ 0, -\frac{m}{n}, \frac{-m+1}{n}, \ldots, \frac{-m+n-1}{n}, \frac{b_1-m}{n}, \frac{b_1-m+1}{n}, \ldots, \frac{b_1-m+n-1}{n}, \ldots, \frac{b_q-m}{n}, \frac{b_q-m+1}{n}, \ldots, \frac{b_q-m+n-1}{n} \end{matrix}\right) = \frac{(2\pi)^{\frac{1}{2}(q-p+1)(1-n)}}{\prod_{j=1}^{q}\Gamma(1-b_j)} n^{\frac{1}{2}(q-p-1)+\sum_{j=1}^{p}a_j-\sum_{j=1}^{q}b_j} \left(\prod_{j=1}^{p}\Gamma(1-a_j)\right)(-z)^{-\frac{m}{n}} \sum_{k=0}^{n-1} e^{-\frac{2\pi i k m}{n}} {}_pF_q\left(1-a_1, \ldots, 1-a_p; 1-b_1, \ldots, 1-b_q; n^{q-p+1} e^{\frac{2\pi i k}{n}} (-z)^{1/n}\right) /; m \in \mathbb{N}^+ \wedge n \in \mathbb{N}^+$$

Case $\{m, n, p, q\} = \{1, n, n, n\}$

07.34.03.0017.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n \\ b_1, b_2, \ldots, b_n \end{matrix}\right) = \frac{\prod_{k=1}^{n}\Gamma(b_1-a_k+1)}{\prod_{k=2}^{n}\Gamma(b_1-b_k+1)} z^{b_1} {}_nF_{n-1}(b_1-a_1+1, \ldots, b_1-a_n+1; b_1-b_2+1, \ldots, b_1-b_n+1; -z)$$

07.34.03.0018.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} a, a_2, \ldots, a_n \\ 0, a_2-1, \ldots, a_n-1 \end{matrix}\right) = \Gamma(1-a) \sum_{k=2}^{n+1} \frac{1}{1-a_k} {}_2F_1(1-a, 1-a_k; 2-a_k; -z) \prod_{\substack{j=2 \\ j\neq k}}^{n+1} \frac{1}{a_k-a_j}$$

07.34.03.0019.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} b_1+2, \ldots, b_{r+1}+2, b_{r+2}+1, \ldots, b_n+1 \\ 0, -2, \ldots, -2 \end{matrix}\right) = \frac{(-1)^{r-1}}{z} \left(\sum_{k=0}^{r-1} \frac{(-1)^{r-k}(n-1)_k}{k!} \operatorname{Li}_{r-k}(-z) - \frac{1}{z} \sum_{k=0}^{n-2} \frac{(r)_k}{k!} \operatorname{Li}_{n-k-1}(-z) - \binom{n+r-2}{r}\right) /; b_1 = b_2 = \ldots = b_{n-1} = -2$$

07.34.03.0020.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} 0, \ldots, 0 \\ 0, a_1-1, \ldots, a_{n-r-1}-1, a_{n-r}-2, \ldots, a_{n-1}-2 \end{matrix}\right) = \frac{(-1)^n}{z} \left(\sum_{k=0}^{n-2} \frac{(-1)^{n-k-1}(r)_k}{k!} \operatorname{Li}_{n-k-1}(-z) - \frac{1}{z} \sum_{k=0}^{r-1} \frac{(n-1)_k}{k!} \operatorname{Li}_{r-k}(-z) - \binom{n+r-2}{n-1}\right) /; a_1 = a_2 = \ldots = a_n = 0$$

07.34.03.0021.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} a, c, \ldots, c \\ a, c-1, \ldots, c-1 \end{matrix}\right) = z^a \,\hat{\Phi}(-z, n-1, a-c+1) /; n-1 \in \mathbb{N}^+$$

07.34.03.0022.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} 0, a, \ldots, a \\ 0, a-1, \ldots, a-1 \end{matrix}\right) = \hat{\Phi}(-z, n-1, a) /; n-1 \in \mathbb{N}^+$$

07.34.03.0023.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} a, a, \ldots, a \\ a, a-1, \ldots, a-1 \end{matrix}\right) = -z^{a-1} \operatorname{Li}_{n-1}(-z) /; n-1 \in \mathbb{N}^+$$

07.34.03.0024.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} a, \ldots, a \\ a+1, a+1, \ldots, a+1 \end{matrix}\right) = z^{a+1} \sum_{k=0}^{n-1} \frac{(k+1)z^k}{(z+1)^{k+2}} \sum_{j=0}^{k} (-1)^j \binom{k}{j} (j+1)^{n-1}$$

07.34.03.0025.01

$$G_{n,n}^{1,n}\left(z \,\middle|\, \begin{matrix} 0, 1-m, \ldots, 1-m \\ 0, -m, \ldots, -m \end{matrix}\right) = \frac{(-1)^m}{z^m}\left(\mathrm{Li}_{n-1}(-z) - \sum_{k=1}^{m-1} \frac{(-z)^k}{k^{n-1}}\right) /; m \in \mathbb{N}^+$$

07.34.03.0026.01

$$G_{n,n}^{1,n}\left(-1 \,\middle|\, \begin{matrix} 0, a, \ldots, a \\ 0, a-1, \ldots, a-1 \end{matrix}\right) = \frac{(-1)^{n-1}}{(n-2)!} \psi^{(n-2)}(1-a) /; n-2 \in \mathbb{N}^+$$

07.34.03.0027.01

$$G_{n,n}^{1,n}\left(-1 \,\middle|\, \begin{matrix} 0, a, \ldots, a \\ 0, a-1, \ldots, a-1 \end{matrix}\right) = \hat{\zeta}(n-1, 1-a) /; n-1 \in \mathbb{N}^+$$

07.34.03.0028.01

$$G_{n,n}^{1,n}\left(-1 \,\middle|\, \begin{matrix} 0, 1, \ldots, 1 \\ 0, 0, \ldots, 0 \end{matrix}\right) = -\zeta(n-1) /; n-2 \in \mathbb{N}^+$$

07.34.03.0029.01

$$G_{n,n}^{1,n}\left(1 \,\middle|\, \begin{matrix} 0, 1, \ldots, 1 \\ 0, 0, \ldots, 0 \end{matrix}\right) = \left(1-2^{2-n}\right)\zeta(n-1) /; n-2 \in \mathbb{N}^+$$

Case $\{m, n, p, q\} = \{1, n, n, n+1\}$

07.34.03.0030.01

$$G_{n,n+1}^{1,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n \\ b_1, b_2, \ldots, b_{n+1} \end{matrix}\right) = \frac{\prod_{k=1}^{n} \Gamma(b_1 - a_k + 1)}{\prod_{k=2}^{n+1} \Gamma(b_1 - b_k + 1)} z^{b_1} {}_nF_n(b_1 - a_1 + 1, \ldots, b_1 - a_n + 1; b_1 - b_2 + 1, \ldots, b_1 - b_{n+1} + 1; -z)$$

07.34.03.0031.01

$$G_{n,n+1}^{1,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n \\ 0, a_1+1, \ldots, a_n+1 \end{matrix}\right) = \sum_{k=1}^{n} \frac{1}{1-a_k} {}_1F_1(1-a_k; 2-a_k; -z) \prod_{\substack{j=1 \\ j \neq k}}^{n} \frac{1}{a_k - a_j}$$

07.34.03.0032.01

$$G_{n,n+1}^{1,n}\left(-z \,\middle|\, \begin{matrix} a, \ldots, a \\ 0, a-1, \ldots, a-1 \end{matrix}\right) = e^z R_n(z) /; R_0(z) = 1 \bigwedge R_{n+1}(z) = z \frac{\partial R_n(z)}{\partial z} + (z+a-1) R_n(z)$$

07.34.03.0033.01

$$G_{n,n+1}^{1,n}\left(-z \,\middle|\, \begin{matrix} a, \ldots, a \\ 0, a+1, \ldots, a+1 \end{matrix}\right) = \frac{\partial^n e^{z e^t + (a-1)t}}{\partial t^n} /; t = 0 \bigwedge R_0(z) = 1 \bigwedge R_{n+1}(z) = z \frac{\partial R_n(z)}{\partial z} + (z+a-1) R_n(z)$$

07.34.03.0034.01

$$G_{n,n+1}^{1,n}\left(z \,\middle|\, \begin{matrix} -1, \ldots, -1 \\ 0, 0, \ldots, 0 \end{matrix}\right) = e^{-z} \sum_{k=0}^{n} \frac{(-1)^k}{(k+1)!} \sum_{j=0}^{k} (-1)^j \binom{k+1}{j+1} (j+1)^{n+1} (-z)^k$$

07.34.03.0035.01

$$G_{n,n+1}^{1,n}\left(z \,\middle|\, \begin{matrix} -1, \ldots, -1 \\ 0, 0, \ldots, 0 \end{matrix}\right) = -\left(\frac{d}{dz} \prod_{k=1}^{n} \left(z \frac{d}{dz}\right)\right) e^{-z}$$

Case $\{m, n, p, q\} = \{m, 0, m, m\}$

07.34.03.0036.01

$$G_{m,m}^{m,0}\left(z \,\middle|\, \begin{matrix} a, \ldots, a \\ a-1, \ldots, a-1 \end{matrix}\right) = \frac{(-1)^{m-1}}{(m-1)!} z^{a-1} \log^{m-1}(z)\, \theta(1-|z|)$$

Case $\{m, n, p, q\} = \{m, 0, 0, m\}$

07.34.03.1081.01

$$G_{0,m}^{m,0}\left(z \,\middle|\, b, b+\frac{1}{m}, b+\frac{2}{m}, \ldots, b+\frac{m-1}{m}\right) = \frac{(2\pi)^{\frac{m-1}{2}}}{\sqrt{m}} z^b e^{-m z^{1/m}} /; m \in \mathbb{N}^+$$

Case $\{m, n, p, q\} = \{m, 1, m, m\}$

07.34.03.0037.01

$$G_{m,m}^{m,1}\left(z \,\middle|\, \begin{matrix} a, c, \ldots, c \\ a, c-1, \ldots, c-1 \end{matrix}\right) = z^{a-1} \hat{\Phi}\left(-\frac{1}{z}, m-1, c-a\right) /; m-2 \in \mathbb{N}^+$$

07.34.03.0038.01

$$G_{m,m}^{m,1}\left(z \,\middle|\, \begin{matrix} a, a+1, \ldots, a+1 \\ a, a, \ldots, a \end{matrix}\right) = -z^a \operatorname{Li}_{m-1}\left(-\frac{1}{z}\right) /; m-1 \in \mathbb{N}^+$$

07.34.03.0039.01

$$G_{m,m}^{m,1}\left(-1 \,\middle|\, \begin{matrix} 1, a, \ldots, a \\ 1, a-1, \ldots, a-1 \end{matrix}\right) = \frac{(-1)^{m-1}}{(m-2)!} \psi^{(m-2)}(a-1) /; m-2 \in \mathbb{N}^+$$

07.34.03.0040.01

$$G_{m,m}^{m,1}\left(-1 \,\middle|\, \begin{matrix} 1, a, \ldots, a \\ 1, a-1, \ldots, a-1 \end{matrix}\right) = \hat{\zeta}(m-1, a-1) /; m-1 \in \mathbb{N}^+$$

07.34.03.0041.01

$$G_{m,m}^{m,1}\left(-1 \,\middle|\, \begin{matrix} 0, 1, \ldots, 1 \\ 0, 0, \ldots, 0 \end{matrix}\right) = -\zeta(m-1) /; m-2 \in \mathbb{N}^+$$

07.34.03.0042.01

$$G_{m,m}^{m,1}\left(1 \,\middle|\, \begin{matrix} 0, 1, \ldots, 1 \\ 0, 0, \ldots, 0 \end{matrix}\right) = \left(1-2^{2-m}\right) \zeta(m-1) /; m-2 \in \mathbb{N}^+$$

Case $\{m, n, p, q\} = \{q, 1, p, q\}$

07.34.03.0043.01

$$G_{p,q}^{q,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2, \ldots, a_p \\ b_1, \ldots, b_q \end{matrix}\right) = \frac{\prod_{k=1}^{q} \Gamma(b_k - a_1 + 1)}{\prod_{k=2}^{p} \Gamma(a_k - a_1 + 1)} z^{a_1 - 1} {}_qF_{p-1}\left(b_1 - a_1 + 1, \ldots, b_q - a_1 + 1; a_2 - a_1 + 1, \ldots, a_p - a_1 + 1; -\frac{1}{z}\right) /; p \geq q$$

07.34.03.0044.01

$$G_{p,q}^{q,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2, \ldots, a_p \\ b_1, \ldots, b_q \end{matrix}\right) = \prod_{k=1}^{q} \Gamma(b_k - a_1 + 1) z^{a_1 - 1} {}_q\tilde{F}_{p-1}\left(b_1 - a_1 + 1, \ldots, b_q - a_1 + 1; a_2 - a_1 + 1, \ldots, a_p - a_1 + 1; -\frac{1}{z}\right) /; p \geq q$$

Cases with $m = 0$

Case $\{m, n, p, q\} = \{0, 0, 0, 0\}$

07.34.03.0045.01

$$G_{0,0}^{0,0}\left(x \,\middle|\, \right) = \delta(x-1) /; x > -1$$

Case {m, n, p, q} = {0, 1, 1, 0}

07.34.03.0046.01

$$G_{1,0}^{0,1}(z \mid a) = z^{a-1} e^{-1/z}$$

Case {m, n, p, q} = {0, 1, 1, 1}

07.34.03.0047.01

$$G_{1,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a \\ b \end{matrix}\right) = \frac{z^{a-1}}{\Gamma(a-b)} \left(1-\frac{1}{z}\right)^{a-b-1} \theta(|z|-1)$$

07.34.03.0048.01

$$G_{1,1}^{0,1}\left(x \,\middle|\, \begin{matrix} a \\ b \end{matrix}\right) = \frac{x^b}{\Gamma(a-b)} (x-1)^{a-b-1} \theta(x-1) /; x > 0$$

07.34.03.0049.01

$$G_{1,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a \\ a-1 \end{matrix}\right) = z^{a-1} \theta(|z|-1)$$

07.34.03.0050.01

$$G_{1,1}^{0,1}\left(x \,\middle|\, \begin{matrix} a \\ a-1 \end{matrix}\right) = x^{a-1} \theta(x-1) /; x \in \mathbb{R} \land x > -1$$

Case {m, n, p, q} = {0, 1, 2, 0}

07.34.03.0051.01

$$G_{2,0}^{0,1}(z \mid a_1, a_2) = \frac{1}{\Gamma(1-a_1+a_2)} z^{a_1-1} {}_0F_1\left(; 1-a_1+a_2; -\frac{1}{z}\right)$$

07.34.03.0052.01

$$G_{2,0}^{0,1}(z \mid a_1, a_2) = z^{\frac{1}{2}(a_1+a_2)-1} J_{a_2-a_1}\left(\frac{2}{\sqrt{z}}\right)$$

07.34.03.0053.01

$$G_{2,0}^{0,1}\left(z \,\middle|\, a, a+n-\tfrac{1}{2}\right) = -\frac{i}{\sqrt{\pi}} e^{-\frac{\pi i n}{2}} z^{a-1} (-z)^{n/2} \left(\sqrt{-z} \left(\sin\left(\frac{n\pi}{2} - \frac{2i}{\sqrt{-z}}\right) \sum_{k=0}^{\left\lfloor \frac{1}{4}\left(2\left|n-\frac{1}{2}\right|-3\right)\right\rfloor} \frac{2^{-4k-2} (-z)^k \left(2k+\left|n-\frac{1}{2}\right|+\frac{1}{2}\right)!}{\left(\left|n-\frac{1}{2}\right|-\frac{3}{2}-2k\right)!\, \Gamma(2k+2)}\right) + \right.$$
$$\left. i \cos\left(\frac{n\pi}{2} - \frac{2i}{\sqrt{-z}}\right) \sum_{k=0}^{\left\lfloor \frac{1}{4}\left(2\left|n-\frac{1}{2}\right|-1\right)\right\rfloor} \frac{16^{-k} (-z)^k \Gamma\left(2k+\left|n-\frac{1}{2}\right|+\frac{1}{2}\right)}{(2k)!\, \Gamma\left(\left|n-\frac{1}{2}\right|+\frac{1}{2}-2k\right)}\right) /; n \in \mathbb{Z}$$

07.34.03.0054.01

$$G_{2,0}^{0,1}\left(z \,\middle|\, a, a-\tfrac{1}{2}\right) = \frac{z^{a-1}}{\sqrt{\pi}} \cos\left(\frac{2}{\sqrt{z}}\right)$$

07.34.03.0055.01

$$G_{2,0}^{0,1}\left(z \,\middle|\, a, a+\tfrac{1}{2}\right) = \frac{z^{a-\frac{1}{2}}}{\sqrt{\pi}} \sin\left(\frac{2}{\sqrt{z}}\right)$$

Case $\{m, n, p, q\} = \{0, 1, 2, 1\}$

07.34.03.0056.01

$$G_{2,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1 \end{matrix}\right) = \frac{1}{\Gamma(a_1 - b_1)} z^{a_1 - 1} \, {}_1\tilde{F}_1\left(1 - a_1 + b_1; 1 - a_1 + a_2; \frac{1}{z}\right)$$

07.34.03.0057.01

$$G_{2,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b \end{matrix}\right) = \frac{z^{a-1}}{\Gamma(c - b)} L_{a-b-1}^{c-a}\left(\frac{1}{z}\right)$$

07.34.03.0058.01

$$G_{2,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a, a \\ b \end{matrix}\right) = \frac{z^{a-1}}{\Gamma(a - b)} L_{a-b-1}\left(\frac{1}{z}\right)$$

07.34.03.0059.01

$$G_{2,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a, b \\ b \end{matrix}\right) = \frac{\sin((a - b)\pi)}{\pi} z^{a-1} e^{1/z}$$

Case $\{m, n, p, q\} = \{0, 1, 2, 2\}$

07.34.03.0060.01

$$G_{2,2}^{0,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = \frac{\theta(|z| - 1)}{\Gamma(a_1 - b_1)\Gamma(a_1 - b_2)} z^{a_1 - 1} \, {}_2\tilde{F}_1\left(1 - a_1 + b_1, 1 - a_1 + b_2; 1 - a_1 + a_2; -\frac{1}{z}\right)$$

Case $\{m, n, p, q\} = \{0, 1, 3, 0\}$

07.34.03.0061.01

$$G_{3,0}^{0,1}(z \mid a_1, a_2, a_3) = z^{a_1 - 1} \, {}_0\tilde{F}_2\left(; 1 - a_1 + a_2, 1 - a_1 + a_3; -\frac{1}{z}\right)$$

07.34.03.0062.01

$$G_{3,0}^{0,1}\left(z \,\middle|\, a, a - \tfrac{2}{3}, a - \tfrac{1}{3}\right) = \frac{z^{a-1}}{2\sqrt{3}\,\pi} \exp\left(-\frac{3}{2\sqrt[3]{-z}}\right)\left(2\cos\left(\frac{3\sqrt{3}}{2\sqrt[3]{-z}}\right) + \exp\left(\frac{9}{2\sqrt[3]{-z}}\right)\right)$$

07.34.03.0063.01

$$G_{3,0}^{0,1}\left(z \,\middle|\, a, a - \tfrac{1}{3}, a + \tfrac{1}{3}\right) = \frac{\sqrt[3]{-z}\, z^{a-1}}{2\sqrt{3}\,\pi} \exp\left(-\frac{3}{2\sqrt[3]{-z}}\right)\left(\exp\left(\frac{9}{2\sqrt[3]{-z}}\right) - 2\cos\left(\frac{\pi}{3} + \frac{3\sqrt{3}}{2\sqrt[3]{-z}}\right)\right)$$

07.34.03.0064.01

$$G_{3,0}^{0,1}\left(z \,\middle|\, a, a + \tfrac{1}{3}, a + \tfrac{2}{3}\right) = \frac{(-z)^{2/3} z^{a-1}}{2\sqrt{3}\,\pi} \exp\left(-\frac{3}{2\sqrt[3]{-z}}\right)\left(\exp\left(\frac{9}{2\sqrt[3]{-z}}\right) - 2\cos\left(\frac{\pi}{3} - \frac{3\sqrt{3}}{2\sqrt[3]{-z}}\right)\right)$$

Case $\{m, n, p, q\} = \{0, 1, 3, 1\}$

07.34.03.0065.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1 \end{matrix}\right) = \frac{1}{\Gamma(a_1 - b_1)} z^{a_1 - 1} \, {}_1\tilde{F}_2\left(1 - a_1 + b_1; 1 - a_1 + a_2, 1 - a_1 + a_3; \frac{1}{z}\right)$$

07.34.03.0066.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, c,\, a-\frac{1}{2} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-1}}{\pi\,\Gamma(c-a+1)}\, {}_0F_1\left(;\, c-a+1;\, \frac{1}{z}\right)$$

07.34.03.0067.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, c,\, a-\frac{1}{2} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-1}}{\pi}\, {}_0\tilde{F}_1\left(;\, -a+c+1;\, \frac{1}{z}\right)$$

07.34.03.0068.01

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

07.34.03.0069.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{2}{3},\, a-\frac{1}{2} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-1}}{2\sqrt[6]{3}\,\pi}\left(\mathrm{Bi}'\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right) - \sqrt{3}\,\mathrm{Ai}'\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right)\right)$$

07.34.03.0070.01

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

07.34.03.0071.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2},\, a-\frac{1}{3} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-1}}{2\sqrt[3]{3}\,\pi}\left(3\,\mathrm{Ai}\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right) + \sqrt{3}\,\mathrm{Bi}\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right)\right)$$

07.34.03.0072.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2},\, a+\frac{1}{4} \\ a-\frac{3}{4} \end{matrix}\right) = \frac{1-i}{\pi}\, z^{a-\frac{3}{4}}\, C\left((1+i)\sqrt{\frac{2}{\pi}}\,\frac{1}{\sqrt[4]{z}}\right)$$

07.34.03.0073.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2},\, a+\frac{1}{4} \\ a-\frac{3}{4} \end{matrix}\right) = \frac{z^{a-\frac{3}{4}}}{2\pi}\left(\mathrm{erf}\left(\sqrt{2}\,\frac{1}{\sqrt[4]{z}}\right) + \mathrm{erfi}\left(\sqrt{2}\,\frac{1}{\sqrt[4]{z}}\right)\right)$$

07.34.03.0074.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2},\, a+\frac{1}{3} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-\frac{2}{3}}}{2\sqrt[3]{3}\,\pi}\left(\sqrt{3}\,\mathrm{Bi}\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right) - 3\,\mathrm{Ai}\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right)\right)$$

07.34.03.0075.01

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

07.34.03.0076.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2},\, a+\frac{2}{3} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-\frac{1}{3}}}{2\sqrt[6]{3}\,\pi}\left(\sqrt{3}\,\mathrm{Ai}'\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right) + \mathrm{Bi}'\left(\frac{3^{2/3}}{\sqrt[3]{z}}\right)\right)$$

07.34.03.0077.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, a+\frac{3}{4} \\ a-\frac{1}{4} \end{matrix}\right) = -\frac{1+i}{\pi}\, z^{a-\frac{1}{4}}\, S\left((1+i)\sqrt{\frac{2}{\pi}}\, \frac{1}{\sqrt[4]{z}}\right)$$

07.34.03.0078.01

$$G_{3,1}^{0,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, a+\frac{3}{4} \\ a-\frac{1}{4} \end{matrix}\right) = \frac{z^{a-\frac{1}{4}}}{2\pi}\left(\operatorname{erfi}\left(\sqrt{2}\, \frac{1}{\sqrt[4]{z}}\right) - \operatorname{erf}\left(\sqrt{2}\, \frac{1}{\sqrt[4]{z}}\right)\right)$$

Case $\{m, n, p, q\} = \{0, 1, 3, 2\}$

07.34.03.0079.01

$$G_{3,2}^{0,1}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2,\, a_3 \\ b_1,\, b_2 \end{matrix}\right) = \frac{1}{\Gamma(a_1-b_1)\,\Gamma(a_1-b_2)}\, z^{a_1-1}\, {}_2\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2;\, 1-a_1+a_2,\, 1-a_1+a_3;\, -\frac{1}{z}\right)$$

Case $\{m, n, p, q\} = \{0, 1, 3, 3\}$

07.34.03.0080.01

$$G_{3,3}^{0,1}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2,\, a_3 \\ b_1,\, b_2,\, b_3 \end{matrix}\right) =$$
$$\frac{\theta(|z|-1)}{\Gamma(a_1-b_1)\,\Gamma(a_1-b_2)\,\Gamma(a_1-b_3)}\, z^{a_1-1}\, {}_3\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2,\, 1-a_1+b_3;\, 1-a_1+a_2,\, 1-a_1+a_3;\, \frac{1}{z}\right)$$

Case $\{m, n, p, q\} = \{0, 1, 4, 0\}$

07.34.03.0081.01

$$G_{4,0}^{0,1}(z \mid a_1,\, a_2,\, a_3,\, a_4) = z^{a_1-1}\, {}_0\tilde{F}_3\left(;\, a_2-a_1+1,\, a_3-a_1+1,\, a_4-a_1+1;\, -\frac{1}{z}\right)$$

07.34.03.0082.01

$$G_{4,0}^{0,1}\left(z \,\middle|\, a,\, c,\, c+\frac{1}{2},\, 2c-a+1\right) = \frac{z^{c-\frac{1}{2}}}{\sqrt{\pi}}\, I_{2c-2a+1}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) J_{2c-2a+1}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right)$$

Case $\{m, n, p, q\} = \{0, 2, 2, 0\}$

07.34.03.0083.01

$$G_{2,0}^{0,2}(z \mid a_1,\, a_2) = \pi\csc(\pi(a_1-a_2))\left(z^{a_1-1}\, {}_0\tilde{F}_1\left(;\, 1-a_1+a_2;\, \frac{1}{z}\right) - z^{a_2-1}\, {}_0\tilde{F}_1\left(;\, a_1-a_2+1;\, \frac{1}{z}\right)\right) /;\, a_2-a_1 \notin \mathbb{Z}$$

07.34.03.0084.01

$$G_{2,0}^{0,2}(z \mid a,\, c) = 2\, z^{\frac{1}{2}(a+c)-1}\, K_{a-c}\left(\frac{2}{\sqrt{z}}\right)$$

07.34.03.0085.01

$$G_{2,0}^{0,2}\left(z \,\middle|\, a,\, a+\frac{1}{2}\right) = \sqrt{\pi}\, z^{a-\frac{1}{2}}\, e^{-\frac{2}{\sqrt{z}}}$$

Case $\{m, n, p, q\} = \{0, 2, 2, 1\}$

07.34.03.0086.01

$$G_{2,1}^{0,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1 \end{matrix}\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{1}{\Gamma(a_1 - b_1)} z^{a_1 - 1} {}_1\tilde{F}_1\left(1 - a_1 + b_1; -a_1 + a_2 + 1; -\frac{1}{z}\right) - \frac{1}{\Gamma(a_2 - b_1)} z^{a_2 - 1} {}_1\tilde{F}_1\left(1 - a_2 + b_1; a_1 - a_2 + 1; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0087.01

$$G_{2,1}^{0,2}\left(z \middle| \begin{matrix} a, c \\ b \end{matrix}\right) = z^{a-1} e^{-\frac{1}{z}} U\left(c - b, c - a + 1, \frac{1}{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0088.01

$$G_{2,1}^{0,2}\left(z \middle| \begin{matrix} a, c \\ a - 1 \end{matrix}\right) = z^{a-1} \Gamma\left(a - c, \frac{1}{z}\right)$$

07.34.03.0089.01

$$G_{2,1}^{0,2}\left(z \middle| \begin{matrix} a, c \\ a - 1 \end{matrix}\right) = \Gamma(a - c) z^{a-1} Q\left(a - c, \frac{1}{z}\right)$$

07.34.03.0090.01

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

07.34.03.0091.01

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

07.34.03.0092.01

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

07.34.03.0093.01

$$G_{2,1}^{0,2}\left(z \middle| \begin{matrix} a, a \\ a - 1 \end{matrix}\right) = -\frac{1}{2} z^{a-1} \left(2 \operatorname{Ei}\left(-\frac{1}{z}\right) + 2 \log\left(\frac{1}{z}\right) - \log\left(-\frac{1}{z}\right) + \log(-z)\right)$$

07.34.03.0094.01

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

Case $\{m, n, p, q\} = \{0, 2, 2, 2\}$

07.34.03.0095.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{1}{\Gamma(a_1 - b_1) \Gamma(a_1 - b_2)} z^{a_1 - 1} {}_2\tilde{F}_1\left(1 - a_1 + b_1, 1 - a_1 + b_2; 1 - a_1 + a_2; \frac{1}{z}\right) - \frac{1}{\Gamma(a_2 - b_1) \Gamma(a_2 - b_2)} z^{a_2 - 1} {}_2\tilde{F}_1\left(1 - a_2 + b_1, 1 - a_2 + b_2; a_1 - a_2 + 1; \frac{1}{z}\right)\right) \theta(|z| - 1) /; a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0096.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = z^{b_1} (z - 1)^{a_1 + a_2 - b_1 - b_2 - 1} {}_2\tilde{F}_1(a_1 - b_2, a_2 - b_2; a_1 + a_2 - b_1 - b_2; 1 - z) \theta(|z| - 1)$$

07.34.03.0097.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix} \right.\right) = z^{b_1} (z-1)^{a_1+a_2-b_1-b_2-1} \, {}_2\tilde{F}_1(a_1-b_2, a_2-b_2; a_1+a_2-b_1-b_2; 1-z) \, \theta(|z|-1) \,/;\, z \notin (-\infty, -1)$$

07.34.03.0098.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, d \end{matrix} \right.\right) = \frac{\Gamma(b-c+1)\,\theta(|z|-1)}{\Gamma(a-d)} (z-1)^{a-b+c-d-1} z^d \, P_{b-c}^{(a-b+c-d-1,d-b)}(2z-1)$$

07.34.03.0099.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, d \end{matrix} \right.\right) = \frac{\Gamma(b-a+1)\,\theta(|z|-1)}{\Gamma(c-d)} z^{b+d-a} (z-1)^{a-b+c-d-1} \, P_{b-a}^{(a-b+c-d-1,a-c)}\left(\frac{2}{z}-1\right) /;$$

07.34.03.0100.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, 2c-b-1 \end{matrix} \right.\right) = \theta(|z|-1)\, z^{c-1} (z-1)^{\frac{a-c}{2}} \, P_{c-b-1}^{c-a}\left(\frac{2}{z}-1\right) /;\, z \notin (-\infty, -1)$$

07.34.03.0101.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, 2c-b-1 \end{matrix} \right.\right) = \frac{\Gamma(2c-a-b)\,\theta(|z|-1)}{\Gamma(a-c+1)\,(2a-2c+1)_{2c-a-b-1}} z^{2c-a-1} (z-1)^{a-c} \, C_{2c-a-b-1}^{a-c+\frac{1}{2}}\left(\frac{2}{z}-1\right)$$

07.34.03.0102.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, b+c-a \end{matrix} \right.\right) = \frac{\sqrt{\pi}\;\theta(|z|-1)}{\Gamma(a-b)} z^{\frac{1}{4}(2c-2a-1)+b} (z-1)^{a-b-\frac{1}{2}} \, \mathfrak{P}_{a-c-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\frac{z+1}{2\sqrt{z}}\right)$$

07.34.03.0103.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, a-b+c-\frac{1}{2} \end{matrix} \right.\right) =$$

$$\frac{2^{c-a-1}\,\Gamma(b-a+1)\,\Gamma\left(c-b+\frac{1}{2}\right)}{\pi\sqrt{z-1}} z^{\frac{a+c-1}{2}} \theta(|z|-1) \left(P_{2b-a-c}^{a-c}\left(-\sqrt{\frac{z-1}{z}}\right) + P_{2b-a-c}^{a-c}\left(\sqrt{\frac{z-1}{z}}\right)\right) /;\, z \notin (-\infty, -1)$$

07.34.03.0104.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, b+c-a \end{matrix} \right.\right) = \frac{2\, e^{-i(a-c)\pi}\,\theta(|z|-1)}{\Gamma(a-b)\,\Gamma(2a-b-c)} z^{b+\frac{c-a}{2}} (z-1)^{a-b-1} \, \mathfrak{Q}_{a-b-1}^{a-c}\left(\frac{z+1}{z-1}\right)$$

07.34.03.0105.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, b+\frac{1}{2} \end{matrix} \right.\right) = \frac{\Gamma(2b-2c+2)\,\theta(|z|-1)}{\Gamma\left(a-2b+c-\frac{1}{2}\right)(2(a-2b+c-1))_{2b-2c+1}} z^b (z-1)^{a-2b+c-\frac{3}{2}} \, C_{2b-2c+1}^{a-2b+c-1}\left(\sqrt{z}\right)$$

07.34.03.0106.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, b+\frac{1}{2} \end{matrix} \right.\right) = 2^{a-2b+c-\frac{3}{2}}\,\theta(|z|-1)\, z^b (z-1)^{\frac{1}{4}(2a+2c-3)-b} \, \mathfrak{P}_{a-c-\frac{1}{2}}^{2b-a-c+\frac{3}{2}}\left(\sqrt{z}\right)$$

07.34.03.0107.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, b+\frac{1}{2} \end{matrix} \right.\right) = \frac{2^{a-2b+c-1}\, e^{i(a-c)\pi}\,\theta(|z|-1)}{\sqrt{\pi}\;\Gamma(2c-2b-1)} z^b (z-1)^{\frac{a+c}{2}-b-1} \, \mathfrak{Q}_{a-2b+c-2}^{c-a}\left(\sqrt{\frac{z}{z-1}}\right)$$

07.34.03.0108.01

$$G_{2,2}^{0,2}\left(z \left| \begin{matrix} a, c \\ b, \frac{a+c-1}{2} \end{matrix} \right.\right) = \frac{\Gamma(b-a+1)\,\theta(|z|-1)}{\Gamma\left(\frac{1}{2}(a-2b+c+1)\right)(a-2b+c)_{b-a}} z^{\frac{a+c-1}{2}} (z-1)^{\frac{a+c-1}{2}-b} \, C_{b-a}^{\frac{a+c}{2}-b}(2z-1)$$

07.34.03.0109.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, c \\ b, \frac{a+c-1}{2} \end{array} \right.\right) = (z-1)^{\frac{1}{4}(a-2b+c-1)}\, \theta(|z|-1)\, z^{\frac{1}{4}(a+2b+c-1)}\, \mathrm{P}_{\frac{a-c-1}{2}}^{b+\frac{1-a-c}{2}}(2z-1)$$

07.34.03.0110.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, c \\ b, \frac{a+c-1}{2} \end{array} \right.\right) = \frac{e^{\frac{\pi i}{2}(c-a)}\, \theta(|z|-1)}{\sqrt{\pi}\, \Gamma(a-b)} (z-1)^{\frac{1}{4}(a-2b+c-2)}\, z^{\frac{1}{4}(a+2b+c-2)}\, \mathbb{Q}_{\frac{a+c}{2}-b-1}^{\frac{a-c}{2}}\left(\frac{2z-1}{2\sqrt{z-1}\,\sqrt{z}}\right) /;\ \mathrm{Re}(z) > 0$$

07.34.03.0111.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, c \end{array} \right.\right) = 2^{2a-b-c-\frac{1}{2}}\, \theta(|z|-1)\, z^{\frac{1}{4}(2b+2c-1)}(z-1)^{a-\frac{1}{4}(2b+2c+1)}\, P_{b-c-\frac{1}{2}}^{b+c-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0112.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+1 \\ b, b \end{array} \right.\right) = z^b\, P_{b-a}(2z-1)\, \theta(|z|-1)$$

07.34.03.0113.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{\theta(|z|-1)}{\sqrt{\pi}\, \sqrt{z-1}} z^b\, T_{a-b-\frac{1}{2}}(2z-1)$$

07.34.03.0114.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{z^b\, \theta(|z|-1)}{\sqrt{\pi}\, \sqrt{z-1}} T_{\frac{2a-2b-1}{4}}\left(8z^2-8z+1\right) /;\ \mathrm{Re}(z) > 0$$

07.34.03.0115.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{\theta(|z|-1)}{2\sqrt{\pi}\, \sqrt{z-1}} z^b \left(\left(\sqrt{z}-\sqrt{z-1}\right)^{2(a-b)-1} + \left(\sqrt{z}+\sqrt{z-1}\right)^{2(a-b)-1}\right)$$

07.34.03.0116.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{2^{2(b-a)}\, \theta(|z|-1)}{\sqrt{\pi}\, \sqrt{z-1}} z^b \left(\left(\sqrt{\sqrt{z}+1}-\sqrt{\sqrt{z}-1}\right)^{4(a-b)-2} + \left(\sqrt{\sqrt{z}-1}+\sqrt{\sqrt{z}+1}\right)^{4(a-b)-2}\right)$$

07.34.03.0117.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{\theta(|z|-1)}{\sqrt{\pi}\, \sqrt{z-1}} z^b \cosh\left((2b-2a+1)\cosh^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0118.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+2 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{2\, \theta(|z|-1)}{(a-b-1)\sqrt{\pi}} z^{b+\frac{1}{2}} \sqrt{z-1}\, U_{a-b-2}(2z-1)$$

07.34.03.0119.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+2 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{4\, \theta(|z|-1)}{(a-b-1)\sqrt{\pi}} z^{b+\frac{1}{2}} (2z-1)\sqrt{z-1}\, U_{\frac{a-b-3}{2}}\left(8z^2-8z+1\right) /;\ \mathrm{Re}(z) > 0$$

07.34.03.0120.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+2 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{\theta(|z|-1)}{2\sqrt{\pi}\, (a-b-1)} z^b \left(\left(\sqrt{z}+\sqrt{z-1}\right)^{2(a-b-1)} - \left(\sqrt{z}-\sqrt{z-1}\right)^{2(a-b-1)}\right)$$

07.34.03.0121.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a, 2b-a+2 \\ b, b+\frac{1}{2} \end{array} \right.\right) = \frac{2^{2(b-a)+1}\, \theta(|z|-1)}{\sqrt{\pi}\, (a-b-1)} z^b \left(\left(\sqrt{\sqrt{z}-1}+\sqrt{\sqrt{z}+1}\right)^{4(a-b-1)} - \left(\sqrt{\sqrt{z}+1}-\sqrt{\sqrt{z}-1}\right)^{4(a-b-1)}\right)$$

07.34.03.0122.01

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

07.34.03.0123.01

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

07.34.03.0124.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a,\, b+1 \\ b,\, a-1 \end{matrix}\right) = \frac{\theta(|z|-1)}{a-b-1} z^{\frac{a+b-3}{2}} \left(z^2-1\right) U_{\frac{a-b-3}{2}}\left(\frac{z^2+1}{2z}\right)$$

07.34.03.0125.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a,\, a \\ b,\, 2a-b-1 \end{matrix}\right) = z^{a-1} P_{b-a}\left(\frac{2}{z}-1\right) \theta(|z|-1)$$

07.34.03.0126.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b-1 \end{matrix}\right) = \frac{4\,\theta(|z|-1)}{(2a-2b-1)\sqrt{\pi}} z^{a-\frac{3}{2}} \sqrt{z-1}\, U_{a-b-\frac{3}{2}}\left(\frac{2}{z}-1\right)$$

07.34.03.0127.01

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

07.34.03.0128.01

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

07.34.03.0129.01

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

07.34.03.0130.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a,\, a \\ a-1,\, a-1 \end{matrix}\right) = -z^{a-1} \log\left(\frac{1}{z}\right) \theta(|z|-1)$$

07.34.03.0131.01

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

07.34.03.0132.01

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

07.34.03.0133.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a,\, a \\ a-\frac{3}{4},\, a-\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a-\frac{3}{4}} K\left(\frac{1}{2}\left(1-\sqrt{z}\right)\right)$$

07.34.03.0134.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{matrix} a,\, a \\ a-\frac{3}{4},\, a-\frac{1}{4} \end{matrix}\right) = \frac{2\sqrt{2}\,\theta(|z|-1)}{\pi\sqrt{\sqrt{z}+1}} z^{a-\frac{3}{4}} K\left(\frac{\sqrt{z}-1}{\sqrt{z}+1}\right)$$

07.34.03.0135.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi} \sqrt{\sqrt{z}-\sqrt{z-1}}\; z^{a-\frac{3}{4}} K\left(2\left(\sqrt{z}-\sqrt{z-1}\right)\sqrt{z-1}\right) /; z \notin (-\infty, -1)$$

07.34.03.0136.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi} \sqrt{\sqrt{z}-\sqrt{z-1}}\; z^{a-\frac{3}{4}} K\left(\frac{2\sqrt{z-1}}{\left(\sqrt{z-1}+\sqrt{z}\right)}\right) /; z \notin (-\infty, -1)$$

07.34.03.0137.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{\sqrt{z-1}+\sqrt{z}}}\; z^{a-\frac{3}{4}} K\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}+\sqrt{z}}\right) /; z \notin (-\infty, -1)$$

07.34.03.0138.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{\sqrt{z}-\sqrt{z-1}}}\; z^{a-\frac{3}{4}} K\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right)$$

07.34.03.0139.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi}\; z^{a-\frac{1}{2}} K(1-z) /; z \notin (-\infty, -1)$$

07.34.03.0140.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi}\; z^{a-1} K\left(\frac{z-1}{z}\right) /; z \notin (-\infty, -1)$$

07.34.03.0141.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = \frac{4\,\theta(|z|-1)}{\pi\left(\sqrt{z}+1\right)}\; z^{a-\frac{1}{2}} K\left(\left(\frac{1-\sqrt{z}}{1+\sqrt{z}}\right)^2\right)$$

07.34.03.0142.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi}\; z^{a-\frac{3}{4}} K\left(-\frac{\left(\sqrt{z}-1\right)^2}{4\sqrt{z}}\right)$$

07.34.03.0143.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi\left(\sqrt{z-1}+\sqrt{z}\right)}\; z^{a-\frac{1}{2}} K\left(\frac{4\sqrt{z-1}\sqrt{z}}{\left(\sqrt{z-1}+\sqrt{z}\right)^2}\right) /; \mathrm{Re}(z) > 0$$

07.34.03.0144.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = \frac{2\,\theta(|z|-1)}{\pi\left(\sqrt{z}-\sqrt{z-1}\right)}\; z^{a-\frac{1}{2}} K\left(-\frac{4\sqrt{z-1}\sqrt{z}}{\left(\sqrt{z-1}-\sqrt{z}\right)^2}\right) /; \mathrm{Re}(z) > 0$$

07.34.03.0145.01

$$G_{2,2}^{0,2}\left(z \middle| \begin{array}{c} a, a \\ a+\left\lfloor\frac{n}{2}\right\rfloor, a-n+\left\lfloor\frac{n}{2}\right\rfloor-\frac{1}{2} \end{array}\right) = \frac{(-1)^{\left\lfloor\frac{n}{2}\right\rfloor}\left\lfloor\frac{n}{2}\right\rfloor!}{\Gamma\left(n-\left\lfloor\frac{n}{2}\right\rfloor+\frac{1}{2}\right)} \left(\frac{z-1}{z}\right)^{\frac{1}{2}\left(n-2\left\lfloor\frac{n}{2}\right\rfloor-1\right)} z^{a-1} P_n\left(\sqrt{\frac{z-1}{z}}\right) \theta(|z|-1) /; n \in \mathbb{N}$$

07.34.03.0146.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi}\, z^{a-\frac{3}{4}} \sqrt{\sqrt{1-z}+1}\; E\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right)$$

07.34.03.0147.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi}\, z^{a-\frac{3}{4}} \sqrt{1-\sqrt{1-z}}\; E\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right)$$

07.34.03.0148.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{1-\sqrt{1-z}}}\, z^{a-\frac{1}{4}}\; E\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right)$$

07.34.03.0149.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{\sqrt{1-z}+1}}\, z^{a-\frac{1}{4}}\; E\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\, z \notin (-\infty,\, -1)$$

07.34.03.0150.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi}\, z^{a-\frac{3}{4}} \sqrt{1+\sqrt{1-z}}\; E\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right) /;\, z \notin (-\infty,\, -1)$$

07.34.03.0151.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi}\, z^{a-\frac{3}{4}} \sqrt{1-\sqrt{1-z}}\; E\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\, z \notin (-\infty,\, -1)$$

07.34.03.0152.01

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

07.34.03.0153.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi}\, z^{a-\frac{1}{2}}\, K\!\left(\frac{\sqrt{z}-1}{2\sqrt{z}}\right)$$

07.34.03.0154.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{matrix}\right) = \frac{2\sqrt{2}\;\theta(|z|-1)}{\pi\sqrt{\sqrt{z}+1}}\, z^{a-\frac{1}{4}}\, K\!\left(\frac{1-\sqrt{z}}{1+\sqrt{z}}\right)$$

07.34.03.0155.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{\sqrt{1-z}+1}}\, z^{a-\frac{1}{4}}\, K\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right)$$

07.34.03.0156.01

$$G_{2,2}^{0,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{matrix}\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{1-\sqrt{1-z}}}\, z^{a-\frac{1}{4}}\, K\!\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\, z \notin (-\infty,\, -1)$$

07.34.03.0157.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} \sqrt{\sqrt{1-z}+1}\; z^{a-\frac{3}{4}} K\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\; z \notin (-\infty, -1)$$

07.34.03.0158.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+1 \\ a-\frac{1}{2},\, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a-\frac{1}{2}} E(1-z)$$

07.34.03.0159.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+1 \\ a-\frac{1}{2},\, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a} E\left(1-\frac{1}{z}\right) /;\; z \notin (-\infty, -1)$$

07.34.03.0160.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+1 \\ a-\frac{1}{4},\, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{\sqrt{z}-\sqrt{z-1}}} z^{a-\frac{1}{4}} E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}+\sqrt{z}}\right) /;\; z \notin (-\infty, -1)$$

07.34.03.0161.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+1 \\ a-\frac{1}{4},\, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi\sqrt{\sqrt{z-1}+\sqrt{z}}} z^{a-\frac{1}{4}} E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right)$$

07.34.03.0162.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+1 \\ a-\frac{1}{4},\, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a-\frac{1}{4}} \sqrt{\sqrt{z-1}+\sqrt{z}}\; E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}+\sqrt{z}}\right) /;\; z \notin (-\infty, -1)$$

07.34.03.0163.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+1 \\ a-\frac{1}{4},\, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a-\frac{1}{4}} \sqrt{\sqrt{z}-\sqrt{z-1}}\; E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right)$$

07.34.03.0164.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+2 \\ a+\frac{1}{2},\, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi\left(\sqrt{z}-\sqrt{z-1}\right)} z^{a+\frac{1}{2}} E\left(\frac{4\sqrt{z-1}\sqrt{z}}{\left(\sqrt{z-1}+\sqrt{z}\right)^2}\right) /;\; |z|<1 \lor \mathrm{Re}(z)>0$$

07.34.03.0165.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+2 \\ a+\frac{1}{2},\, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi\left(\sqrt{z-1}+\sqrt{z}\right)} z^{a+\frac{1}{2}} E\left(-\frac{4\sqrt{z-1}\sqrt{z}}{\left(\sqrt{z}-\sqrt{z-1}\right)^2}\right) /;\; |z|<1 \lor \mathrm{Re}(z)>0$$

07.34.03.0166.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+2 \\ a+\frac{1}{2},\, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a+\frac{1}{2}} \left(\sqrt{z-1}+\sqrt{z}\right) E\left(\frac{4\sqrt{z-1}\sqrt{z}}{\left(\sqrt{z-1}+\sqrt{z}\right)^2}\right) /;\; |z|<1 \lor \mathrm{Re}(z)>0$$

07.34.03.0167.01

$$G_{2,2}^{0,2}\left(z \left| \begin{array}{c} a,\, a+2 \\ a+\frac{1}{2},\, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(|z|-1)}{\pi} z^{a+\frac{1}{2}} \left(\sqrt{z}-\sqrt{z-1}\right) E\left(-\frac{4\sqrt{z-1}\sqrt{z}}{\left(\sqrt{z}-\sqrt{z-1}\right)^2}\right) /;\; |z|<1 \lor \mathrm{Re}(z)>0$$

Case $\{m, n, p, q\} = \{0, 2, 3, 0\}$

07.34.03.0168.01

$$G_{3,0}^{0,2}(z \mid a_1, a_2, a_3) = \pi \csc(\pi (a_2 - a_1)) \left(z^{a_2-1} {}_0\tilde{F}_2\left(; a_1 - a_2 + 1, -a_2 + a_3 + 1; \frac{1}{z}\right) - z^{a_1-1} {}_0\tilde{F}_2\left(; -a_1 + a_2 + 1, -a_1 + a_3 + 1; \frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \land a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0169.01

$$G_{3,0}^{0,2}\left(z \,\middle|\, a, a - \tfrac{1}{3}, a + \tfrac{1}{3}\right) = \frac{2 z^{a-\frac{2}{3}}}{\sqrt{3}} \exp\left(-\frac{3}{2\sqrt[3]{z}}\right) \sin\left(\frac{3\sqrt{3}}{2\sqrt[3]{z}}\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 2, 3, 1\}$

07.34.03.0170.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1 \end{matrix}\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{1}{\Gamma(a_1 - b_1)} z^{a_1-1} {}_1\tilde{F}_2\left(1 - a_1 + b_1; 1 - a_1 + a_2, 1 - a_1 + a_3; -\frac{1}{z}\right) - \frac{1}{\Gamma(a_2 - b_1)} z^{a_2-1} {}_1\tilde{F}_2\left(1 - a_2 + b_1; a_1 - a_2 + 1, 1 - a_2 + a_3; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \land a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0171.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, c, b \\ b \end{matrix}\right) = z^{\frac{a+c}{2}-1} \left(J_{c-a}\left(\frac{2}{\sqrt{z}}\right) \cos((b - c)\pi) + Y_{c-a}\left(\frac{2}{\sqrt{z}}\right) \sin((b - c)\pi)\right) /; z \notin (-\infty, 0)$$

07.34.03.0172.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, c, a + \frac{1}{2} \\ a + \frac{1}{2} \end{matrix}\right) = z^{\frac{1}{2}(a+c-2)} Y_{a-c}\left(\frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0173.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a + 1, b \\ b \end{matrix}\right) = \frac{1}{2} \sec((a - b)\pi) z^{b-\frac{1}{2}} \left(J_{2a-2b-1}\left(\frac{2}{\sqrt{z}}\right) - J_{2b-2a+1}\left(\frac{2}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0174.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a, b \\ b \end{matrix}\right) = \frac{\sec((b - a)\pi)}{2} z^{b-1} \left(J_{2b-2a}\left(\frac{2}{\sqrt{z}}\right) + J_{2a-2b}\left(\frac{2}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0175.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a + 1, b + \frac{1}{2} \\ b \end{matrix}\right) = \frac{\sqrt{\pi}}{2} \sec((a - b)\pi) z^{b-\frac{1}{2}} \left(J_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 - J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right) /; z \notin (-\infty, 0)$$

07.34.03.0176.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a + 1, b + \frac{1}{2} \\ b \end{matrix}\right) = -\frac{\sqrt{\pi}}{2} z^{b-\frac{1}{2}} \left(J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) + J_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0177.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, b - 1, a - \frac{1}{2} \\ b \end{matrix}\right) = \frac{z^{a-\frac{3}{2}}}{\sqrt{\pi}} \left((a - b)\sqrt{z} \cos\left(\frac{2}{\sqrt{z}}\right) + \sin\left(\frac{2}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0178.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, b - 1, a + \frac{1}{2} \\ b \end{matrix}\right) = \frac{z^{a-1}}{2\sqrt{\pi}} \left((2a - 2b + 1)\sqrt{z} \sin\left(\frac{2}{\sqrt{z}}\right) - 2\cos\left(\frac{2}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0179.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, b+\frac{1}{2}, 2b-a+1 \\ b \end{matrix}\right) = -\sqrt{\pi}\, z^{b-\frac{1}{2}} J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0180.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, b+1, a-\frac{1}{2} \\ b \end{matrix}\right) = -\frac{4^{a-b-1} e^{-i(a+b)\pi}}{\sqrt{\pi}} z^b \left(e^{2ib\pi}\Gamma\left(-2a+2b+2, -2\sqrt{-\frac{1}{z}}\right) + e^{2ia\pi}\Gamma\left(-2a+2b+2, 2\sqrt{-\frac{1}{z}}\right)\right) /; 0 \leq \arg(z) < \pi$$

07.34.03.0181.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, b+1, a+\frac{1}{2} \\ b \end{matrix}\right) = \frac{2^{2a-2b-1} e^{-i(a+b)\pi} z^b}{\sqrt{\pi}} \left(e^{2ib\pi}\Gamma\left(-2a+2b+1, -2\sqrt{-\frac{1}{z}}\right) + e^{2ia\pi}\Gamma\left(-2a+2b+1, 2\sqrt{-\frac{1}{z}}\right)\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

07.34.03.0182.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2}, b \\ b \end{matrix}\right) = \frac{z^{a-1}}{\sqrt{\pi}} \sin\left(\pi(a-b) + \frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0183.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, b-1 \\ b \end{matrix}\right) = \frac{z^{a-1}}{2\sqrt{\pi}} \left((2b-2a-1)\sqrt{z}\cos\left(\pi(a-b) + \frac{2}{\sqrt{z}}\right) - 2\sin\left(\pi(a-b) + \frac{2}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0184.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, b \\ b \end{matrix}\right) = \frac{z^{a-\frac{1}{2}}}{\sqrt{\pi}} \cos\left(\pi(a-b) + \frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0185.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, b+1 \\ b \end{matrix}\right) = -\frac{i\, 2^{2a-2b-1} z^b}{\sqrt{\pi}} \left(\Gamma\left(2b-2a+1, -2\sqrt{-\frac{1}{z}}\right) - \Gamma\left(2b-2a+1, 2\sqrt{-\frac{1}{z}}\right)\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

07.34.03.0186.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a, a-\frac{1}{2} \\ a-1 \end{matrix}\right) = -\frac{2z^{a-1}}{\sqrt{\pi}} \operatorname{Ci}\left(\frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0187.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a, a-\frac{1}{2} \\ a-1 \end{matrix}\right) = -\frac{2z^{a-1}}{\sqrt{\pi}} \left(\operatorname{Chi}\left(\frac{2i}{\sqrt{z}}\right) + \log\left(\frac{2}{\sqrt{z}}\right) - \log\left(\frac{2i}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0188.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{4}, a-\frac{1}{2} \\ a-\frac{3}{4} \end{matrix}\right) = z^{a-\frac{3}{4}} \left(1 - 2C\left(\frac{2}{\sqrt{\pi}\sqrt[4]{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0189.01

$$G_{3,1}^{0,2}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, a+\frac{1}{2} \\ a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-\frac{1}{2}}}{\sqrt{\pi}} \left(\pi - 2\operatorname{Si}\left(\frac{2}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0190.01

$$G_{3,1}^{0,2}\left(z \left| \begin{array}{c} a, a+\frac{3}{4}, a+\frac{1}{2} \\ a-\frac{1}{4} \end{array} \right.\right) = z^{a-\frac{1}{4}} \left(1 - 2\, S\left(\frac{2}{\sqrt{\pi}\, \sqrt[4]{z}}\right)\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 2, 3, 2\}$

07.34.03.0191.01

$$G_{3,2}^{0,2}\left(z \left| \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2 \end{array} \right.\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{1}{\Gamma(a_1 - b_1)\, \Gamma(a_1 - b_2)} z^{a_1 - 1}\, {}_2\tilde{F}_2\left(1 - a_1 + b_1, 1 - a_1 + b_2; 1 - a_1 + a_2, 1 - a_1 + a_3; \frac{1}{z}\right) - \frac{1}{\Gamma(a_2 - b_1)\, \Gamma(a_2 - b_2)} z^{a_2 - 1}\, {}_2\tilde{F}_2\left(1 - a_2 + b_1, 1 - a_2 + b_2; a_1 - a_2 + 1, 1 - a_2 + a_3; \frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2 - a_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{0, 2, 3, 3\}$

07.34.03.0192.01

$$G_{3,3}^{0,2}\left(z \left| \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{array} \right.\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{1}{\Gamma(a_1 - b_1)\, \Gamma(a_1 - b_2)\, \Gamma(a_1 - b_3)} z^{a_1 - 1}\, {}_3\tilde{F}_2\left(1 - a_1 + b_1, 1 - a_1 + b_2, 1 - a_1 + b_3; 1 - a_1 + a_2, 1 - a_1 + a_3; -\frac{1}{z}\right) - \frac{1}{\Gamma(a_2 - b_1)\, \Gamma(a_2 - b_2)\, \Gamma(a_2 - b_3)} z^{a_2 - 1}\, {}_3\tilde{F}_2\left(1 - a_2 + b_1, 1 - a_2 + b_2, 1 - a_2 + b_3; a_1 - a_2 + 1, 1 - a_2 + a_3; -\frac{1}{z}\right)\right) \theta(|z| - 1) /; z \notin (-\infty, 0) \bigwedge a_2 - a_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{0, 2, 4, 0\}$

07.34.03.0193.01

$$G_{4,0}^{0,2}(z \mid a_1, a_2, a_3, a_4) = \pi \csc(\pi (a_2 - a_1)) \left(z^{a_2 - 1}\, {}_0\tilde{F}_3\left(; a_1 - a_2 + 1, -a_2 + a_3 + 1, -a_2 + a_4 + 1; \frac{1}{z}\right) - z^{a_1 - 1}\, {}_0\tilde{F}_3\left(; -a_1 + a_2 + 1, -a_1 + a_3 + 1, -a_1 + a_4 + 1; \frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0194.01

$$G_{4,0}^{0,2}\left(z \mid a, a, a-\frac{1}{2}, a-\frac{1}{2}\right) = z^{a-1} \left(\frac{2}{\pi} K_0\left(\frac{4}{\sqrt[4]{z}}\right) - Y_0\left(\frac{4}{\sqrt[4]{z}}\right)\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 2, 5, 1\}$

07.34.03.0195.01

$$G_{5,1}^{0,2}\left(z \left| \begin{array}{c} a_1, a_2, a_3, a_4, a_5 \\ b_1 \end{array} \right.\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{z^{a_1 - 1}}{\Gamma(a_1 - b_1)}\, {}_1\tilde{F}_4\left(-a_1 + b_1 + 1; -a_1 + a_2 + 1, -a_1 + a_3 + 1, -a_1 + a_4 + 1, -a_1 + a_5 + 1; -\frac{1}{z}\right) - \frac{z^{a_2 - 1}}{\Gamma(a_2 - b_1)}\, {}_1\tilde{F}_4\left(-a_2 + b_1 + 1; a_1 - a_2 + 1, -a_2 + a_3 + 1, -a_2 + a_4 + 1, -a_2 + a_5 + 1; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0196.01

$$G_{5,1}^{0,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, b, b+\frac{1}{2}, 2a-b+\frac{1}{2} \\ b \end{matrix}\right) = \frac{z^{a-\frac{1}{2}}}{\sqrt{\pi}} I_{2a-2b}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) J_{2b-2a}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 3, 3, 0\}$

07.34.03.0197.01

$$G_{3,0}^{0,3}(z \mid a_1, a_2, a_3) = \pi^2 \left(\csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3)) z^{a_1-1} {}_0\tilde{F}_2\left(; 1-a_1+a_2, 1-a_1+a_3; -\frac{1}{z}\right) + \csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3)) z^{a_2-1} {}_0\tilde{F}_2\left(; a_1-a_2+1, 1-a_2+a_3; -\frac{1}{z}\right) + \csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2)) z^{a_3-1} {}_0\tilde{F}_2\left(; a_1-a_3+1, a_2-a_3+1; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{0, 3, 3, 1\}$

07.34.03.0198.01

$$G_{3,1}^{0,3}\left(z \middle| \begin{matrix} a_1, a_2, a_3 \\ b_1 \end{matrix}\right) = \pi^2 \left(\frac{\csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3))}{\Gamma(a_1-b_1)} z^{a_1-1} {}_1\tilde{F}_2\left(1-a_1+b_1; 1-a_1+a_2, 1-a_1+a_3; \frac{1}{z}\right) + \frac{\csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3))}{\Gamma(a_2-b_1)} z^{a_2-1} {}_1\tilde{F}_2\left(1-a_2+b_1; a_1-a_2+1, 1-a_2+a_3; \frac{1}{z}\right) + \frac{\csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2))}{\Gamma(a_3-b_1)} z^{a_3-1} {}_1\tilde{F}_2\left(1-a_3+b_1; a_1-a_3+1, a_2-a_3+1; \frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

07.34.03.0199.01

$$G_{3,1}^{0,3}\left(z \middle| \begin{matrix} a, b+\frac{1}{2}, 2b-a \\ b \end{matrix}\right) = \frac{2z^{b-1}}{\sqrt{\pi}} K_{b-a-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) K_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0200.01

$$G_{3,1}^{0,3}\left(z \middle| \begin{matrix} a, b+\frac{1}{2}, 2b-a+1 \\ b \end{matrix}\right) = \frac{2}{\sqrt{\pi}} z^{b-\frac{1}{2}} K_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 /; z \notin (-\infty, 0)$$

07.34.03.0201.01

$$G_{3,1}^{0,3}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, b+1 \\ b \end{matrix}\right) = 4^{a-b} \sqrt{\pi}\, z^b\, \Gamma\left(2b-2a+1, \frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0202.01

$$G_{3,1}^{0,3}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, b+1 \\ b \end{matrix}\right) = 2\sqrt{\pi}\, z^{a-\frac{1}{2}} E_{2a-2b}\left(\frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0203.01

$$G_{3,1}^{0,3}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, a+\frac{3}{4} \\ a-\frac{1}{4} \end{matrix}\right) = \sqrt{2}\, \pi\, z^{a-\frac{1}{4}} \left(1-\operatorname{erf}\left(\frac{\sqrt{2}}{\sqrt[4]{z}}\right)\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 3, 3, 2\}$

07.34.03.0204.01

$$G_{3,2}^{0,3}\left(z \,\middle|\, \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2 \end{array}\right) = \pi^2 \left(\frac{\csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3))}{\Gamma(a_1-b_1)\Gamma(a_1-b_2)} z^{a_1-1} \, {}_2\tilde{F}_2\left(1-a_1+b_1, 1-a_1+b_2; 1-a_1+a_2, 1-a_1+a_3; -\frac{1}{z}\right) + \frac{\csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3))}{\Gamma(a_2-b_1)\Gamma(a_2-b_2)} z^{a_2-1} \, {}_2\tilde{F}_2\left(1-a_2+b_1, 1-a_2+b_2; a_1-a_2+1, 1-a_2+a_3; -\frac{1}{z}\right) + \frac{\csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2))}{\Gamma(a_3-b_1)\Gamma(a_3-b_2)} z^{a_3-1} \, {}_2\tilde{F}_2\left(1-a_3+b_1, 1-a_3+b_2; a_1-a_3+1, a_2-a_3+1; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{0, 3, 3, 3\}$

07.34.03.0205.01

$$G_{3,3}^{0,3}\left(z \,\middle|\, \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{array}\right) = \pi^2 \left(\frac{\csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3))}{\Gamma(a_1-b_1)\Gamma(a_1-b_2)\Gamma(a_1-b_3)} z^{a_1-1} \, {}_3\tilde{F}_2\left(1-a_1+b_1, 1-a_1+b_2, 1-a_1+b_3; 1-a_1+a_2, 1-a_1+a_3; \frac{1}{z}\right) + \frac{\csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3))}{\Gamma(a_2-b_1)\Gamma(a_2-b_2)\Gamma(a_2-b_3)} z^{a_2-1} \, {}_3\tilde{F}_2\left(1-a_2+b_1, 1-a_2+b_2, 1-a_2+b_3; a_1-a_2+1, 1-a_2+a_3; \frac{1}{z}\right) + \frac{\csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2))}{\Gamma(a_3-b_1)\Gamma(a_3-b_2)\Gamma(a_3-b_3)} z^{a_3-1} \, {}_3\tilde{F}_2\left(1-a_3+b_1, 1-a_3+b_2, 1-a_3+b_3; a_1-a_3+1, a_2-a_3+1; \frac{1}{z}\right)\right) \theta(|z|-1) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

07.34.03.0206.01

$$G_{3,3}^{0,3}\left(z \,\middle|\, \begin{array}{c} a, c, d \\ b, e, a-b+c+d-1 \end{array}\right) = \frac{\theta(|z|-1)}{\Gamma(1-e)} (z-1)^{-e} z^{a+c-1} F_{1\times 0\times 0}^{0\times 2\times 2}\left(\begin{array}{c} ; c-e, a-e; b-a-c+1, d-b; \\ 1-e;;; \end{array} 1-z, 1-\frac{1}{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0207.01

$$G_{3,3}^{0,3}\left(z \,\middle|\, \begin{array}{c} a, a, a \\ a-1, a-1, a-1 \end{array}\right) = \frac{1}{2} z^{a-1} \log^2\left(\frac{1}{z}\right) \theta(|z|-1)$$

Case $\{m, n, p, q\} = \{0, 3, 4, 0\}$

07.34.03.0208.01

$$G_{4,0}^{0,3}(z \mid a_1, a_2, a_3, a_4) = \pi^2 \csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3)) z^{a_1-1} \, {}_0\tilde{F}_3\left(; -a_1+a_2+1, -a_1+a_3+1, -a_1+a_4+1; -\frac{1}{z}\right) + \pi^2 \csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3)) z^{a_2-1} \, {}_0\tilde{F}_3\left(; a_1-a_2+1, -a_2+a_3+1, -a_2+a_4+1; -\frac{1}{z}\right) + \pi^2 \csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2)) z^{a_3-1} \, {}_0\tilde{F}_3\left(; a_1-a_3+1, a_2-a_3+1, -a_3+a_4+1; -\frac{1}{z}\right) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

07.34.03.0209.01

$$G_{4,0}^{0,3}\left(z \,\middle|\, a, c, 2a-c, a-\tfrac{1}{2}\right) = 2\sqrt{\pi} \csc((a-c)\pi) z^{a-1} \left(J_{2c-2a}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) - J_{2a-2c}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right)\right) K_{2a-2c}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0210.01

$$G_{4,0}^{0,3}\left(z \,\middle|\, a, c, 2a-c+1, a+\tfrac{1}{2}\right) = 2\sqrt{\pi}\,\csc((c-a)\pi)\, z^{a-\frac{1}{2}} \left(J_{2c-2a-1}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) + J_{2a-2c+1}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right)\right) K_{2a-2c+1}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) /;\, z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 3, 4, 2\}$

07.34.03.0211.01

$$G_{4,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2 \end{matrix}\right) = \frac{\pi^2 z^{a_1-1} \csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3))}{\Gamma(a_1-b_1)\Gamma(a_1-b_2)} \, {}_2\tilde{F}_3\left(-a_1+b_1+1, -a_1+b_2+1; -a_1+a_2+1, -a_1+a_3+1, -a_1+a_4+1; -\frac{1}{z}\right) + \frac{\pi^2 z^{a_2-1} \csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3))}{\Gamma(a_2-b_1)\Gamma(a_2-b_2)} \, {}_2\tilde{F}_3\left(-a_2+b_1+1, -a_2+b_2+1; a_1-a_2+1, -a_2+a_3+1, -a_2+a_4+1; -\frac{1}{z}\right) + \frac{\pi^2 z^{a_3-1} \csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2))}{\Gamma(a_3-b_1)\Gamma(a_3-b_2)} \, {}_2\tilde{F}_3\left(-a_3+b_1+1, -a_3+b_2+1; a_1-a_3+1, a_2-a_3+1, -a_3+a_4+1; -\frac{1}{z}\right) /;$$
$$z \notin (-\infty, 0) \land a_2-a_1 \notin \mathbb{Z} \land a_3-a_1 \notin \mathbb{Z} \land a_3-a_2 \notin \mathbb{Z}$$

07.34.03.0212.01

$$G_{4,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a, c, 2b-c, 2b-a \\ b, b-\frac{1}{2} \end{matrix}\right) = -\frac{\sqrt{\pi}}{2} z^{b-1} \left(J_{c-a}\left(\frac{1}{\sqrt{z}}\right) Y_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) + J_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) Y_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0213.01

$$G_{4,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+\frac{1}{2}, 2b-a+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \frac{z^{b-\frac{1}{4}}}{\sqrt{2}} \left(\cos\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) - \sin\left(\frac{1}{\sqrt{z}}\right) Y_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0214.01

$$G_{4,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+1, 2b-a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = -\frac{z^{b-\frac{1}{4}}}{\sqrt{2}} \left(\cos\left(\frac{1}{\sqrt{z}}\right) Y_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) + \sin\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0215.01

$$G_{4,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a, b+\frac{1}{2}, 2b-a+1, 2b-a+\frac{1}{2} \\ b, 2b-a+\frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi}}{2} z^{b-\frac{1}{2}} \left(Y_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 - J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right)$$

07.34.03.0216.01

$$G_{4,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a, b+\frac{1}{2}, 2b-a+1, b \\ b, b \end{matrix}\right) = \frac{\sqrt{\pi}}{2} z^{b-\frac{1}{2}} \left(Y_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) - J_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Case $\{m, n, p, q\} = \{0, 3, 4, 1\}$

07.34.03.0217.01

$$G_{5,1}^{0,3}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4, a_5 \\ b_1 \end{matrix}\right) = \frac{\pi^2 z^{a_1-1} \csc(\pi (a_1-a_2)) \csc(\pi (a_1-a_3))}{\Gamma(a_1-b_1)} \, {}_1\tilde{F}_4\left(-a_1+b_1+1; -a_1+a_2+1, -a_1+a_3+1, -a_1+a_4+1, -a_1+a_5+1; \frac{1}{z}\right) + \frac{\pi^2 z^{a_2-1} \csc(\pi (a_2-a_1)) \csc(\pi (a_2-a_3))}{\Gamma(a_2-b_1)} \, {}_1\tilde{F}_4\left(-a_2+b_1+1; a_1-a_2+1, -a_2+a_3+1, -a_2+a_4+1, -a_2+a_5+1; \frac{1}{z}\right) + \frac{\pi^2 z^{a_3-1} \csc(\pi (a_3-a_1)) \csc(\pi (a_3-a_2))}{\Gamma(a_3-b_1)} \, {}_1\tilde{F}_4\left(-a_3+b_1+1; a_1-a_3+1, a_2-a_3+1, -a_3+a_4+1, -a_3+a_5+1; \frac{1}{z}\right) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

07.34.03.0218.01

$$G_{5,1}^{0,3}\left(z \,\middle|\, \begin{matrix} a, a-\frac{n+1}{2}, a-\frac{n}{2}, a-\frac{1}{2}, a-\frac{1}{2} \\ a-\frac{1}{2} \end{matrix}\right) = z^{a-\frac{n}{4}-1} \left(\frac{2}{\pi} K_n\left(\frac{4}{\sqrt[4]{z}}\right) - Y_n\left(\frac{4}{\sqrt[4]{z}}\right)\right) /; n \in \mathbb{Z} \bigwedge z \notin (-\infty, 0)$$

07.34.03.0219.01

$$G_{5,1}^{0,3}\left(z \,\middle|\, \begin{matrix} a, a-\frac{n}{2}, a+\frac{1-n}{2}, a+\frac{1}{2}, a+\frac{1}{2} \\ a+\frac{1}{2} \end{matrix}\right) = z^{a-\frac{n+1}{4}} \left(\frac{2}{\pi} K_n\left(\frac{4}{\sqrt[4]{z}}\right) + Y_n\left(\frac{4}{\sqrt[4]{z}}\right)\right) /; n \in \mathbb{Z} \bigwedge z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 3, 6, 2\}$

07.34.03.0220.01

$$G_{6,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4, a_5, a_6 \\ b_1, b_2 \end{matrix}\right) = \frac{\pi^2 \csc(\pi (a_1-a_2)) \csc(\pi (a_1-a_3))}{\Gamma(a_1-b_1)\,\Gamma(a_1-b_2)} z^{a_1-1} \, {}_2\tilde{F}_5\left(-a_1+b_1+1, -a_1+b_2+1; -a_1+a_2+1, -a_1+a_3+1, -a_1+a_4+1, -a_1+a_5+1, -a_1+a_6+1; -\frac{1}{z}\right) + \frac{\pi^2 \csc(\pi (a_2-a_1)) \csc(\pi (a_2-a_3))}{\Gamma(a_2-b_1)\,\Gamma(a_2-b_2)} z^{a_2-1} \, {}_2\tilde{F}_5\left(-a_2+b_1+1, -a_2+b_2+1; a_1-a_2+1, -a_2+a_3+1, -a_2+a_4+1, -a_2+a_5+1, -a_2+a_6+1; -\frac{1}{z}\right) + \frac{\pi^2 \csc(\pi (a_3-a_1)) \csc(\pi (a_3-a_2))}{\Gamma(a_3-b_1)\,\Gamma(a_3-b_2)} z^{a_3-1} \, {}_2\tilde{F}_5\left(-a_3+b_1+1, -a_3+b_2+1; a_1-a_3+1, a_2-a_3+1, -a_3+a_4+1, -a_3+a_5+1, -a_3+a_6+1; -\frac{1}{z}\right) /; z \notin (-\infty, 0) \bigwedge a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

07.34.03.0221.01

$$G_{6,2}^{0,3}\left(z \,\middle|\, \begin{matrix} a, b+\frac{3}{4}, b+\frac{1}{4}, b, b+\frac{1}{2}, 2b-a+\frac{3}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = -\frac{z^{b-\frac{1}{4}}}{\sqrt{\pi}} I_{2b-2a+\frac{3}{2}}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) Y_{2b-2a+\frac{3}{2}}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 4, 4, 0\}$

07.34.03.0222.01

$$G_{4,0}^{0,4}\left(z \,\middle|\, a, a+\frac{1}{2}, c, 2a-c+1\right) = 8\sqrt{\pi}\, z^{a-\frac{1}{2}} K_{2a-2c+1}\left(\frac{2\sqrt{2}}{\sqrt[4]{-z}}\right) K_{2a-2c+1}\left(\frac{2\sqrt{2}\,\sqrt[4]{-z}}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{0, 4, 4, 2\}$

07.34.03.0223.01

$$G_{4,2}^{0,4}\left(z \middle| \begin{matrix} a, c, c+\frac{1}{2}, 2c-a+1 \\ b, 2c-b \end{matrix}\right) = 2^{2c-2a+2}\sqrt{\pi}\exp\left(-\frac{2}{\sqrt{z}}\right) z^{a-1} U\left(b-a+1, 2c-2a+2, \frac{2}{\sqrt{z}}\right) U\left(2c-a-b+1, 2c-2a+2, \frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0224.01

$$G_{4,2}^{0,4}\left(z \middle| \begin{matrix} a, c, 2b-a+1, 2b-c+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \frac{2}{\sqrt{\pi}} z^{b-\frac{1}{2}} K_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) K_{c-a}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0225.01

$$G_{4,2}^{0,4}\left(z \middle| \begin{matrix} a, c, \frac{a+c-1}{2}, \frac{a+c}{2} \\ b, a-b+c-1 \end{matrix}\right) = 2^{a-c+1}\sqrt{\pi}\, z^{c-1}\exp\left(-\frac{2}{\sqrt{z}}\right) U\left(a-b, a-c+1, \frac{2}{\sqrt{z}}\right) U\left(b-c+1, a-c+1, \frac{2}{\sqrt{z}}\right)$$

Case $\{m, n, p, q\} = \{0, 4, 5, 1\}$

07.34.03.0226.01

$$G_{5,1}^{0,4}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, 2a-b+\frac{1}{2}, b+\frac{1}{2}, b \\ b \end{matrix}\right) = -4\sqrt{\pi}\, z^{a-\frac{1}{2}} K_{2b-2a}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right) Y_{2b-2a}\left(\frac{2\sqrt{2}}{\sqrt[4]{z}}\right)$$

Case $\{m, n, p, q\} = \{0, 4, 5, 3\}$

07.34.03.0227.01

$$G_{5,3}^{0,4}\left(z \middle| \begin{matrix} a, c, 2b-a, 2b-c, 2b-a-\frac{1}{2} \\ b, b-\frac{1}{2}, 2b-a-\frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi}}{2} z^{b-1}\left(Y_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) Y_{c-a}\left(\frac{1}{\sqrt{z}}\right) - J_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) J_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

Cases with $m = 1$

Case $\{m, n, p, q\} = \{1, 0, 0, 1\}$

07.34.03.0228.01

$$G_{0,1}^{1,0}(z \mid b) = e^{-z} z^b$$

Case $\{m, n, p, q\} = \{1, 0, 0, 2\}$

07.34.03.0229.01

$$G_{0,2}^{1,0}(z \mid b_1, b_2) = z^{b_1}\, {}_0\tilde{F}_1(; b_1-b_2+1; -z)$$

07.34.03.0230.01

$$G_{0,2}^{1,0}(z \mid b_1, b_2) = z^{\frac{1}{2}(b_1+b_2)} J_{b_1-b_2}\left(2\sqrt{z}\right)$$

07.34.03.0231.01

$$G_{0,2}^{1,0}\left(z \middle| b, b-\frac{1}{2}\right) = \frac{z^{b-\frac{1}{2}}}{\sqrt{\pi}} \sin\left(2\sqrt{z}\right)$$

07.34.03.0232.01

$$G_{0,2}^{1,0}\left(z \,\middle|\, b, b+\tfrac{1}{2}\right) = \frac{z^b}{\sqrt{\pi}} \cos\left(2\sqrt{z}\right)$$

07.34.03.0233.01

$$G_{0,2}^{1,0}\left(z \,\middle|\, b, b-n-\tfrac{1}{3}\right) = \frac{(-1)^n \sqrt[6]{3}}{2} z^b \frac{\partial^n\left(\frac{1}{\sqrt[3]{-z}}\left(\operatorname{Bi}\left(3^{2/3}\sqrt[3]{-z}\right) - \sqrt{3}\operatorname{Ai}\left(3^{2/3}\sqrt[3]{-z}\right)\right)\right)}{\partial z^n} /; n \in \mathbb{N}$$

07.34.03.0234.01

$$G_{0,2}^{1,0}\left(z \,\middle|\, b, b+n-\tfrac{1}{3}\right) = \frac{\sqrt[6]{3}}{2} z^{b+n} (-z)^{-\frac{1}{3}} \frac{\partial^n\left(\operatorname{Bi}\left(3^{2/3}\sqrt[3]{-z}\right) - \sqrt{3}\operatorname{Ai}\left(3^{2/3}\sqrt[3]{-z}\right)\right)}{\partial z^n} /; n \in \mathbb{N}$$

07.34.03.0235.01

$$G_{0,2}^{1,0}\left(z \,\middle|\, b, b-n+\tfrac{1}{3}\right) = \frac{(-1)^n \sqrt[6]{3}}{2} z^b \frac{\partial^n\left(\sqrt{3}\operatorname{Ai}\left(3^{2/3}\sqrt[3]{-z}\right) + \operatorname{Bi}\left(3^{2/3}\sqrt[3]{-z}\right)\right)}{\partial z^n} /; n \in \mathbb{N}$$

07.34.03.0236.01

$$G_{0,2}^{1,0}\left(z \,\middle|\, b, b+n+\tfrac{1}{3}\right) = \frac{\sqrt[6]{3}}{2} z^{b+n} \sqrt[3]{-z} \frac{\partial^n\left(\frac{1}{\sqrt[3]{-z}}\left(\sqrt{3}\operatorname{Ai}\left(3^{2/3}\sqrt[3]{-z}\right) + \operatorname{Bi}\left(3^{2/3}\sqrt[3]{-z}\right)\right)\right)}{\partial z^n} /; n \in \mathbb{N}$$

07.34.03.0237.01

$$G_{0,2}^{1,0}\left(z \,\middle|\, b, b+\tfrac{1}{2}-n\right) = -\frac{i}{\sqrt{\pi}} e^{-\frac{\pi i n}{2}} z^b (-z)^{-\frac{n}{2}} \left(\frac{1}{\sqrt{-z}} \sin\left(\frac{n\pi}{2} - 2i\sqrt{-z}\right) \sum_{k=0}^{\left\lfloor \frac{1}{4}\left(2\left|n-\frac{1}{2}\right|-3\right)\right\rfloor} \frac{2^{-4k-2}(-z)^{-k}\left(2k+\left|n-\frac{1}{2}\right|+\frac{1}{2}\right)!}{\left(\left|n-\frac{1}{2}\right|-\frac{3}{2}-2k\right)!\,\Gamma(2k+2)} + \right.$$

$$\left. i\cos\left(\frac{n\pi}{2} - 2i\sqrt{-z}\right) \sum_{k=0}^{\left\lfloor \frac{1}{4}\left(2\left|n-\frac{1}{2}\right|-1\right)\right\rfloor} \frac{16^{-k}(-z)^{-k}\,\Gamma\left(2k+\left|n-\frac{1}{2}\right|+\frac{1}{2}\right)}{(2k)!\,\Gamma\left(\left|n-\frac{1}{2}\right|+\frac{1}{2}-2k\right)}\right) /; n \in \mathbb{Z}$$

Case $\{m, n, p, q\} = \{1, 0, 0, 3\}$

07.34.03.0238.01

$$G_{0,3}^{1,0}(z \mid b_1, b_2, b_3) = z^{b_1}\,{}_0\tilde{F}_2(; b_1-b_2+1, b_1-b_3+1; -z)$$

07.34.03.0239.01

$$G_{0,3}^{1,0}\left(z \,\middle|\, a, a-\tfrac{2}{3}, a-\tfrac{1}{3}\right) = \frac{z^a}{2\sqrt{3}\,\pi\,(-z)^{2/3}} e^{-\frac{3}{2}\sqrt[3]{-z}} \left(e^{\frac{9}{2}\sqrt[3]{-z}} - 2\cos\left(\frac{\pi}{3} - \frac{3\sqrt{3}}{2}\sqrt[3]{-z}\right)\right)$$

07.34.03.0240.01

$$G_{0,3}^{1,0}\left(z \,\middle|\, a, a-\tfrac{1}{3}, a+\tfrac{1}{3}\right) = \frac{z^a}{2\sqrt{3}\,\pi\sqrt[3]{-z}} e^{-\frac{3}{2}\sqrt[3]{-z}} \left(e^{\frac{9}{2}\sqrt[3]{-z}} - 2\cos\left(\frac{3\sqrt{3}}{2}\sqrt[3]{-z} + \frac{\pi}{3}\right)\right)$$

07.34.03.0241.01

$$G_{0,3}^{1,0}\left(z \,\middle|\, a, a+\tfrac{1}{3}, a+\tfrac{2}{3}\right) = \frac{z^a}{2\sqrt{3}\,\pi} e^{-\frac{3}{2}\sqrt[3]{-z}} \left(2\cos\left(\frac{3\sqrt{3}}{2}\sqrt[3]{-z}\right) + e^{\frac{9}{2}\sqrt[3]{-z}}\right)$$

Case $\{m, n, p, q\} = \{1, 0, 0, 4\}$

07.34.03.0242.01

$$G_{0,4}^{1,0}(z \mid b_1, b_2, b_3, b_4) = z^{b_1}\, {}_0\tilde{F}_3(; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; -z)$$

07.34.03.0243.01

$$G_{0,4}^{1,0}\left(z \,\middle|\, b, c, c + \tfrac{1}{2}, 2c - b\right) = \frac{z^c}{\sqrt{\pi}} I_{2(b-c)}\left(2\sqrt{2}\sqrt[4]{z}\right) J_{2(b-c)}\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0244.01

$$G_{0,4}^{1,0}\left(z \,\middle|\, b, b - \tfrac{1}{2}, b - \tfrac{1}{4}, b + \tfrac{1}{4}\right) = \frac{z^{b-\frac{1}{2}}}{\sqrt{2}\,\pi^{3/2}} \sin\left(2\sqrt{2}\sqrt[4]{z}\right) \sinh\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0245.01

$$G_{0,4}^{1,0}\left(z \,\middle|\, b, b + \tfrac{1}{4}, b + \tfrac{1}{2}, b + \tfrac{3}{4}\right) = \frac{z^b}{\sqrt{2}\,\pi^{3/2}} \cos\left(2\sqrt{2}\sqrt[4]{z}\right) \cosh\left(2\sqrt{2}\sqrt[4]{z}\right)$$

Case $\{m, n, p, q\} = \{1, 0, 1, 1\}$

07.34.03.0246.01

$$G_{1,1}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ b \end{matrix}\right) = \frac{z^b\ \theta(1 - |z|)}{\Gamma(a - b)} (1 - z)^{a-b-1}$$

07.34.03.0247.01

$$G_{1,1}^{1,0}\left(x \,\middle|\, \begin{matrix} a \\ b \end{matrix}\right) = \frac{x^b\ \theta(1 - x)}{\Gamma(a - b)} (1 - x)^{a-b-1}$$

07.34.03.0248.01

$$G_{1,1}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - 1 \end{matrix}\right) = z^{a-1}\, \theta(1 - |z|)$$

07.34.03.0249.01

$$G_{1,1}^{1,0}\left(x \,\middle|\, \begin{matrix} a \\ a - 1 \end{matrix}\right) = x^{a-1}\, \theta(1 - x)$$

Case $\{m, n, p, q\} = \{1, 0, 1, 2\}$

07.34.03.0250.01

$$G_{1,2}^{1,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2 \end{matrix}\right) = \frac{z^{b_1}}{\Gamma(a_1 - b_1)}\, {}_1\tilde{F}_1(1 - a_1 + b_1; b_1 - b_2 + 1; z)$$

07.34.03.0251.01

$$G_{1,2}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ b, c \end{matrix}\right) = \frac{z^b}{\Gamma(a - c)} L_{a-b-1}^{b-c}(z)$$

07.34.03.0252.01

$$G_{1,2}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ b, b \end{matrix}\right) = \frac{z^b}{\Gamma(a - b)} L_{a-b-1}(z)$$

07.34.03.0253.01

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

Case $\{m, n, p, q\} = \{1, 0, 1, 3\}$

07.34.03.0254.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2, b_3 \end{matrix}\right) = \frac{z^{b_1}}{\Gamma(a_1 - b_1)} \, {}_1\tilde{F}_2(1 - a_1 + b_1; b_1 - b_2 + 1, b_1 - b_3 + 1; z)$$

07.34.03.1082.01

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

07.34.03.0255.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, b, a \end{matrix}\right) = \frac{1}{\pi \, \Gamma\left(a - b + \frac{1}{2}\right)} z^{a-\frac{1}{2}} \, {}_0F_1\left(; a - b + \frac{1}{2}; z\right)$$

07.34.03.0256.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, b, a \end{matrix}\right) = \frac{z^{a-\frac{1}{2}}}{\pi} \, {}_0\tilde{F}_1\left(; a - b + \frac{1}{2}; z\right)$$

07.34.03.0257.01

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

07.34.03.0258.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{3}{4}, a - 1, a - \frac{1}{4} \end{matrix}\right) = \frac{1 - i}{\pi} z^{a-1} C\left((1 + i)\sqrt{\frac{2}{\pi}} \sqrt[4]{z}\right)$$

07.34.03.0259.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{3}{4}, a - 1, a - \frac{1}{4} \end{matrix}\right) = \frac{z^{a-1}}{2\pi} \left(\operatorname{erf}\left(\sqrt{2} \sqrt[4]{z}\right) + \operatorname{erfi}\left(\sqrt{2} \sqrt[4]{z}\right)\right)$$

07.34.03.0260.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, a - \frac{7}{6}, a \end{matrix}\right) = \frac{z^{a-\frac{7}{6}}}{2\sqrt[6]{3}\,\pi} \left(\sqrt{3} \operatorname{Ai}'\left(3^{2/3} \sqrt[3]{z}\right) + \operatorname{Bi}'\left(3^{2/3} \sqrt[3]{z}\right)\right)$$

07.34.03.0261.01

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

07.34.03.0262.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, a - \frac{5}{6}, a \end{matrix}\right) = \frac{z^{a-\frac{5}{6}}}{2\sqrt[3]{3}\,\pi} \left(\sqrt{3} \operatorname{Bi}\left(3^{2/3} \sqrt[3]{z}\right) - 3 \operatorname{Ai}\left(3^{2/3} \sqrt[3]{z}\right)\right)$$

07.34.03.0263.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, a - \frac{1}{6}, a \end{matrix}\right) = \frac{z^{a-\frac{1}{2}}}{2\sqrt[3]{3}\,\pi} \left(3 \operatorname{Ai}\left(3^{2/3} \sqrt[3]{z}\right) + \sqrt{3} \operatorname{Bi}\left(3^{2/3} \sqrt[3]{z}\right)\right)$$

07.34.03.0264.01

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

07.34.03.0265.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a-\frac{1}{2}, a, a+\frac{1}{6} \end{matrix}\right) = \frac{z^{a-\frac{1}{2}}}{2\sqrt[6]{3}\,\pi} \left(\mathrm{Bi}'\left(3^{2/3}\sqrt[3]{z}\right) - \sqrt{3}\,\mathrm{Ai}'\left(3^{2/3}\sqrt[3]{z}\right)\right)$$

07.34.03.0266.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a-\frac{1}{4}, a-1, a-\frac{3}{4} \end{matrix}\right) = -\frac{1+i}{\pi} z^{a-1} S\left((1+i)\sqrt{\frac{2}{\pi}}\sqrt[4]{z}\right)$$

07.34.03.0267.01

$$G_{1,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a \\ a-\frac{1}{4}, a-1, a-\frac{3}{4} \end{matrix}\right) = \frac{z^{a-1}}{2\pi} \left(\mathrm{erfi}\left(\sqrt{2}\sqrt[4]{z}\right) - \mathrm{erf}\left(\sqrt{2}\sqrt[4]{z}\right)\right)$$

Case $\{m, n, p, q\} = \{1, 0, 2, 2\}$

07.34.03.0268.01

$$G_{2,2}^{1,0}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = \frac{1}{\Gamma(a_1-b_1)\,\Gamma(a_2-b_1)} z^{b_1}\, {}_2\tilde{F}_1(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1; -z)\, \theta(1-|z|)$$

Case $\{m, n, p, q\} = \{1, 0, 2, 3\}$

07.34.03.0269.01

$$G_{2,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3 \end{matrix}\right) = \frac{1}{\Gamma(a_1-b_1)\,\Gamma(a_2-b_1)} z^{b_1}\, {}_2\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1, b_1-b_3+1; -z)$$

Case $\{m, n, p, q\} = \{1, 0, 3, 3\}$

07.34.03.0270.01

$$G_{3,3}^{1,0}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{matrix}\right) = \frac{\theta(1-|z|)}{\Gamma(a_1-b_1)\,\Gamma(a_2-b_1)\,\Gamma(a_3-b_1)} z^{b_1}\, {}_3\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1, 1-a_3+b_1; b_1-b_2+1, b_1-b_3+1; z)$$

Case $\{m, n, p, q\} = \{1, 1, 1, 1\}$

07.34.03.0271.01

$$G_{1,1}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b \end{matrix}\right) = \Gamma(1-a+b)\, z^b\, (z+1)^{a-b-1}$$

Case $\{m, n, p, q\} = \{1, 1, 1, 2\}$

07.34.03.0272.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2 \end{matrix}\right) = \Gamma(1-a_1+b_1)\, z^{b_1}\, {}_1\tilde{F}_1(1-a_1+b_1; b_1-b_2+1; -z)$$

07.34.03.0273.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b, c \end{matrix}\right) = e^{-z} z^b\, \Gamma(c-a+1)\, L_{c-a}^{b-c}(z)$$

07.34.03.0274.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ a+n,\, b \end{matrix}\right) = \frac{(-1)^n}{\Gamma(a-b+n)} z^{a+n} \frac{\partial^n \left(e^{-z} (-z)^{b-a} \Gamma(a-b+n, 0, -z)\right)}{\partial z^n} /; n \in \mathbb{N}$$

07.34.03.0275.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b,\, a-1 \end{matrix}\right) = z^{a-1} \Gamma(b-a+1, 0, z)$$

07.34.03.0276.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b,\, a-1 \end{matrix}\right) = \Gamma(b-a+1) z^{a-1} Q(b-a+1, 0, z)$$

07.34.03.0277.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b,\, a-1 \end{matrix}\right) = z^{a-1} \Gamma(b-a+1) - z^b E_{a-b}(z)$$

07.34.03.0278.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b,\, b \end{matrix}\right) = \Gamma(b-a+1) e^{-z} z^b L_{b-a}(z)$$

07.34.03.0279.01

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

07.34.03.0280.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ a,\, b \end{matrix}\right) = e^{-z} (-z)^{b-a} z^a Q(a-b, 0, -z)$$

07.34.03.0281.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ a,\, b \end{matrix}\right) = (-1)^{a-b} z^b \left(e^{-z} - \sum_{k=0}^{a-b-1} \frac{(-z)^k}{k!}\right) /; a-b \in \mathbb{N}^+$$

07.34.03.0282.01

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

07.34.03.0283.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ a,\, a-1 \end{matrix}\right) = -(e^{-z} - 1) z^{a-1}$$

07.34.03.0284.01

$$G_{1,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ a,\, a-\frac{1}{2} \end{matrix}\right) = e^{-z} z^{a-\frac{1}{2}} \operatorname{erfi}\left(\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 1, 3\}$

07.34.03.0285.01

$$G_{1,3}^{1,1}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1,\, b_2,\, b_3 \end{matrix}\right) = \Gamma(1-a_1+b_1) z^{b_1}\, {}_1\tilde{F}_2(1-a_1+b_1; b_1-b_2+1, b_1-b_3+1; -z)$$

07.34.03.0286.01

$$G_{1,3}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b,\, c,\, a+1 \end{matrix}\right) = z^{\frac{b+c}{2}} \left((b-a) J_{b-c}\left(2\sqrt{z}\right) - \sqrt{z}\, J_{b-c+1}\left(2\sqrt{z}\right)\right)$$

07.34.03.0287.01

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

07.34.03.0288.01

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

07.34.03.0289.01

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

07.34.03.0290.01

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

07.34.03.0291.01

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

07.34.03.0292.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ b,\,a+\frac{1}{2},\,2a-b-2\end{matrix}\right)=\frac{\sqrt{\pi}}{4(a-b-1)}\,z^{a-\frac{1}{2}}\left((2a-2b-1)\,J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)^2+(2b-2a+3)\,J_{b-a+\frac{3}{2}}\left(\sqrt{z}\right)^2\right)$$

07.34.03.0293.01

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

07.34.03.0294.01

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

07.34.03.0295.01

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

07.34.03.0296.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a-\frac{1}{2},\,b,\,2a-b-3\end{matrix}\right)=-\frac{\sqrt{\pi}\,z^{a-\frac{3}{2}}}{4(a-b-2)(a-b-1)}\left(\left(2(a-b-1)\sqrt{z}\,J_{a-b-\frac{3}{2}}\left(\sqrt{z}\right)-2z\,J_{a-b-\frac{1}{2}}\left(\sqrt{z}\right)\right)J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)+\left(2\left(2a^2-(4b+5)a+2b^2+5b+z+3\right)J_{a-b-\frac{3}{2}}\left(\sqrt{z}\right)-2(a-b-1)\sqrt{z}\,J_{a-b-\frac{1}{2}}\left(\sqrt{z}\right)\right)J_{b-a+\frac{3}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.0297.01

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

07.34.03.0298.01

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

07.34.03.0299.01

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

07.34.03.0300.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a-\frac{1}{2},\,b,\,2a-b+1\end{matrix}\right)=$$
$$\frac{1}{4}\sqrt{\pi}\,z^{a+\frac{1}{2}}\left(J_{a-b+\frac{3}{2}}(\sqrt{z})\,J_{b-a+\frac{1}{2}}(\sqrt{z})-2\,J_{a-b+\frac{1}{2}}(\sqrt{z})\,J_{b-a-\frac{1}{2}}(\sqrt{z})+J_{a-b-\frac{1}{2}}(\sqrt{z})\,J_{b-a-\frac{3}{2}}(\sqrt{z})\right)$$

07.34.03.0301.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a,\,b,\,a-\frac{1}{2}\end{matrix}\right)=z^{\frac{1}{4}(2a+2b-1)}\,\boldsymbol{H}_{a-b-\frac{1}{2}}(2\sqrt{z})$$

07.34.03.0302.01

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

07.34.03.0303.01

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

07.34.03.0304.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a+\frac{1}{2},\,b,\,2a-b+2\end{matrix}\right)=\frac{1}{4}\sqrt{\pi}\,z^{a+1}\left(J_{a-b+\frac{3}{2}}(\sqrt{z})\left(\sqrt{z}\,J_{b-a+\frac{1}{2}}(\sqrt{z})+2\,(a-b)\,J_{b-a-\frac{1}{2}}(\sqrt{z})\right)-\right.$$
$$\left.2\,J_{a-b+\frac{1}{2}}(\sqrt{z})\left(\sqrt{z}\,J_{b-a-\frac{1}{2}}(\sqrt{z})+(a-b)\,J_{b-a-\frac{3}{2}}(\sqrt{z})\right)+\sqrt{z}\,J_{a-b-\frac{1}{2}}(\sqrt{z})\,J_{b-a-\frac{3}{2}}(\sqrt{z})\right)$$

07.34.03.0305.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a+\frac{3}{2},\,b,\,2a-b+1\end{matrix}\right)=\frac{\sqrt{\pi}}{2}\,z^{a+\frac{1}{2}}\left(\sqrt{z}\,J_{a-b-\frac{1}{2}}(\sqrt{z})\left(\sqrt{z}\,J_{b-a+\frac{1}{2}}(\sqrt{z})+(a-b)\,J_{b-a-\frac{1}{2}}(\sqrt{z})\right)+\right.$$
$$\left.J_{a-b+\frac{1}{2}}(\sqrt{z})\left((b-a)\sqrt{z}\,J_{b-a+\frac{1}{2}}(\sqrt{z})+\left((4b-1)\,a-2a^2-2b^2+b+z\right)J_{b-a-\frac{1}{2}}(\sqrt{z})\right)\right)$$

07.34.03.0306.01

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

07.34.03.0307.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a,\,a-\frac{3}{4},\,a-\frac{1}{4}\end{matrix}\right)=\sqrt{\frac{2}{\pi}}\,z^{a-\frac{3}{4}}\left(\sin(2\sqrt{z})\,C\!\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)-\cos(2\sqrt{z})\,S\!\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)$$

07.34.03.0308.01

$$G_{1,3}^{1,1}\left(z\,\middle|\,\begin{matrix}a\\ a,\,a-\frac{1}{4},\,a+\frac{1}{4}\end{matrix}\right)=\sqrt{\frac{2}{\pi}}\,z^{a-\frac{1}{4}}\left(\cos(2\sqrt{z})\,C\!\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)+\sin(2\sqrt{z})\,S\!\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)$$

07.34.03.1083.01

$$G_{1,3}^{1,1}\left(z \middle| \begin{array}{c} a \\ a-\frac{3}{4}, a-1, a-\frac{1}{4} \end{array}\right) = 2 z^{a-1} C\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)$$

07.34.03.1084.01

$$G_{1,3}^{1,1}\left(z \middle| \begin{array}{c} a \\ a-\frac{1}{4}, a-1, a-\frac{3}{4} \end{array}\right) = 2 z^{a-1} S\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 2, 1\}$

07.34.03.0309.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1 \end{array}\right) = \Gamma(1-a_1+b_1) z^{a_1-1} {}_1\tilde{F}_1\left(1-a_1+b_1; 1-a_1+a_2; -\frac{1}{z}\right)$$

07.34.03.0310.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, c \\ b \end{array}\right) = \Gamma(b-c+1) e^{-\frac{1}{z}} z^{a-1} L_{b-c}^{c-a}\left(\frac{1}{z}\right)$$

07.34.03.0311.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, c \\ a \end{array}\right) = \left(-\frac{1}{z}\right)^{a-c} z^{a-1} e^{-1/z} Q\left(c-a, 0, -\frac{1}{z}\right)$$

07.34.03.0312.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, c \\ a \end{array}\right) = (-1)^{c-a} z^a \left(e^{-\frac{1}{z}} - \sum_{k=0}^{c-a-1} \frac{(-1)^k z^{-k}}{k!}\right) /; c-a \in \mathbb{N}^+$$

07.34.03.0313.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, b+1 \\ b \end{array}\right) = z^b \Gamma\left(b-a+1, 0, \frac{1}{z}\right)$$

07.34.03.0314.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, b+1 \\ b \end{array}\right) = \Gamma(b-a+1) z^b Q\left(b-a+1, 0, \frac{1}{z}\right)$$

07.34.03.0315.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, b+1 \\ b \end{array}\right) = z^b \Gamma(b-a+1) - z^{a-1} E_{a-b}\left(\frac{1}{z}\right)$$

07.34.03.0316.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, 2b-a+1 \\ b \end{array}\right) = \sqrt{\pi} z^{b-\frac{1}{2}} e^{-\frac{1}{2z}} I_{b-a+\frac{1}{2}}\left(\frac{1}{2z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0317.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, a \\ b \end{array}\right) = \Gamma(b-a+1) e^{-\frac{1}{z}} z^{a-1} L_{b-a}\left(\frac{1}{z}\right)$$

07.34.03.0318.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ a-\frac{1}{2} \end{array}\right) = \sqrt{\pi} z^{a-\frac{1}{2}} \operatorname{erf}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0319.01

$$G_{2,1}^{1,1}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ a \end{matrix}\right) = e^{-1/z} z^{a-\frac{1}{2}} \operatorname{erfi}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0320.01

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

Case $\{m, n, p, q\} = \{1, 1, 2, 2\}$

07.34.03.0321.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = \Gamma(1-a_1+b_1) \left(\frac{\theta(|z|-1)}{\Gamma(a_1-b_2)} z^{a_1-1}\, {}_2\tilde{F}_1\left(1-a_1+b_1, 1-a_1+b_2; 1-a_1+a_2; \frac{1}{z}\right) + \frac{\theta(1-|z|)}{\Gamma(a_2-b_1)} z^{b_1}\, {}_2\tilde{F}_1(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1; z)\right)$$

07.34.03.0322.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a, c \\ b, c \end{matrix}\right) = \frac{z^b\, \Gamma(b-a+1)}{\pi} \left(\sin((c-b)\pi)\, \theta(1-|z|)\, (1-z)^{a-b-1} + (z-1)^{a-b-1} \sin((a-c)\pi)\, \theta(|z|-1)\right)$$

07.34.03.0323.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)}{\Gamma(c-a+1)\,\Gamma(c-b)} z^b (z+1)^{a-b-1}\, {}_2F_1\left(\frac{b-a+1}{2}, \frac{b-a}{2}+1; c-a+1; \frac{4z}{(z+1)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0324.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)\, ((1-z)\operatorname{sgn}(1-|z|))^{2c-2b-1}}{\Gamma(c-a+1)\,\Gamma(c-b)} z^b (z+1)^{a+b-2c}\, {}_2F_1\left(c-\frac{a+b}{2}, c+\frac{1-a-b}{2}; c-a+1; \frac{4z}{(z+1)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0325.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)\, ((1-z)\operatorname{sgn}(1-|z|))^{a-b-2}}{\Gamma(c-a+1)\,\Gamma(c-b)} z^b (z+1)\, {}_2F_1\left(\frac{b-a}{2}+1, \frac{1-a-b}{2}+c; c-a+1; -\frac{4z}{(z-1)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0326.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)\, ((1-z)\operatorname{sgn}(1-|z|))^{a-b-1}}{\Gamma(c-a+1)\,\Gamma(c-b)} z^b\, {}_2F_1\left(\frac{1+b-a}{2}, c-\frac{a+b}{2}; c-a+1; -\frac{4z}{(z-1)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0327.01

$$G_{2,2}^{1,1}\left(z \middle| \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)}{\Gamma(c-a+1)\,\Gamma(c-b)} z^b \left(\sqrt{z}+1\right)^{2(a-b-1)}\, {}_2F_1\left(b-a+1, c-a+\frac{1}{2}; 2c-2a+1; \frac{4\sqrt{z}}{\left(\sqrt{z}+1\right)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0328.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)}{\Gamma(c-a+1)\,\Gamma(c-b)} \left(\left(1-\sqrt{z}\right)\operatorname{sgn}(1-|z|)\right)^{-2(a+b-2c)} \left((1-z)\operatorname{sgn}(1-|z|)\right)^{2a-2c-1} z^b \, {}_2F_1\!\left(2c-a-b, c-a+\frac{1}{2}; 2c-2a+1; \frac{4\sqrt{z}}{\left(\sqrt{z}+1\right)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0329.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)\left(\left(1-\sqrt{z}\right)\operatorname{sgn}(1-|z|)\right)^{2(a-b-1)}}{\Gamma(c-a+1)\,\Gamma(c-b)} z^b \, {}_2F_1\!\left(b-a+1, c-a+\frac{1}{2}; 2c-2a+1; -\frac{4\sqrt{z}}{\left(\sqrt{z}-1\right)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0330.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)\left((1-z)\operatorname{sgn}(1-|z|)\right)^{2a-2c-1}}{\Gamma(c-a+1)\,\Gamma(c-b)} \left(\sqrt{z}+1\right)^{2(2c-a-b)} z^b \, {}_2F_1\!\left(2c-a-b, c-a+\frac{1}{2}; 2c-2a+1; -\frac{4\sqrt{z}}{\left(\sqrt{z}-1\right)^2}\right) /; z \notin (-1, 0)$$

07.34.03.0331.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{\Gamma(b-a+1)\left((1-z)\operatorname{sgn}(1-|z|)\right)^{c-b-1}}{\Gamma(c-b)} z^{b+\frac{a-c}{2}} \, \mathfrak{P}_{c-b-1}^{a-c}\!\left(\frac{1+z}{(1-z)\operatorname{sgn}(1-|z|)}\right) /; z \notin (-1, 0)$$

07.34.03.0332.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a+b-c \end{matrix}\right) = \frac{e^{i\pi\left(c-b-\frac{1}{2}\right)}\left((1-z)\operatorname{sgn}(1-|z|)\right)^{c-b-\frac{1}{2}}}{\sqrt{\pi}\,\Gamma(c-b)} z^{b+\frac{1}{4}(2a-2c-1)} \, \mathfrak{Q}_{c-a-\frac{1}{2}}^{b-c+\frac{1}{2}}\!\left(\frac{z+1}{2\sqrt{z}}\right) /; z \notin (-1, 0)$$

07.34.03.0333.01

$$G_{2,2}^{1,1}\left(x \,\middle|\, \begin{matrix} a, \frac{a+b}{2} \\ b, \frac{a+b}{2} \end{matrix}\right) = \frac{\Gamma(b-a+1)}{\pi} \sin\left(\frac{\pi(a-b)}{2}\right) x^b \, |1-x|^{a-b-1} /; x > 0$$

07.34.03.0334.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, \frac{a+b}{2} \\ b, \frac{a+b}{2} \end{matrix}\right) = \frac{\Gamma(b-a+1)}{\pi} \sin\left(\frac{\pi(a-b)}{2}\right) z^b \left((1-z)\operatorname{sgn}(1-|z|)\right)^{a-b-1}$$

07.34.03.0335.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, \frac{1}{2}(a+b+1) \\ b, \frac{1}{2}(a+b+1) \end{matrix}\right) = \cos\left(\frac{(a-b)\pi}{2}\right) \frac{\Gamma(b-a+1)}{\pi} z^b \operatorname{sgn}(1-|z|) \left((1-z)\operatorname{sgn}(1-|z|)\right)^{a-b-1}$$

07.34.03.0336.01

$$G_{2,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a, b \\ a, b \end{matrix}\right) = \frac{z^a \sin((a-b)\pi)}{\pi(z-1)}$$

07.34.03.0337.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, 2a-b-\frac{1}{2} \\ a-\frac{1}{2},\, b \end{array} \right.\right) = \frac{2^{b-a+\frac{1}{2}}\sqrt{\pi}\, ((1-z)\operatorname{sgn}(1-|z|))^{a-b-\frac{1}{2}}}{\sqrt{z+1}\;\Gamma(a-b)}\, z^{\frac{1}{2}\left(a+b-\frac{1}{2}\right)}\, P_{-\frac{1}{4}}^{b-a+\frac{1}{2}}\left(\frac{z^2-6z+1}{(z+1)^2}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0338.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, a-\frac{1}{2} \\ b,\, b+\frac{1}{2} \end{array} \right.\right) = \frac{z^b\,\Gamma(b-a+1)\,((1-z)\operatorname{sgn}(1-|z|))^{a-b-1}}{\sqrt{\pi}\;\Gamma\left(a-b-\frac{1}{2}\right)} \cosh\left((b-a+1)\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right)\right) /;\, z \notin (-1, 0)$$

07.34.03.0339.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, a-\frac{1}{2} \\ b,\, b+\frac{1}{2} \end{array} \right.\right) = \frac{2^{2a-2b-3}\csc((a-b)\pi)}{\Gamma(2a-2b-1)}\, z^b \left(\left(1+\sqrt{z}\right)^{2(a-b-1)} + \left(\left(1-\sqrt{z}\right)\operatorname{sgn}(1-|z|)\right)^{2(a-b-1)}\right)$$

07.34.03.0340.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, a+\frac{1}{2} \\ b,\, b-\frac{1}{2} \end{array} \right.\right) = \frac{\Gamma(b-a)}{\sqrt{\pi}\;\Gamma\left(a-b+\frac{1}{2}\right)}\, z^{b-\frac{1}{2}}\, (\operatorname{sgn}(1-|z|)\,(1-z))^{a-b} \sinh\left((b-a)\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right)\right) /;\, z \notin (-1, 0)$$

07.34.03.0341.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2} \end{array} \right.\right) = \frac{2}{\pi\left(\sqrt{z}+1\right)}\, z^{a-\frac{1}{2}}\, K\left(\frac{4\sqrt{z}}{\left(\sqrt{z}+1\right)^2}\right) /;\, z \notin (-1, 0)$$

07.34.03.0342.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2} \end{array} \right.\right) = \frac{2\operatorname{sgn}(1-|z|)}{\pi\left(1-\sqrt{z}\right)}\, z^{a-\frac{1}{2}}\, K\left(-\frac{4\sqrt{z}}{\left(\sqrt{z}-1\right)^2}\right) /;\, z \notin (-1, 0)$$

07.34.03.0343.01

$$G_{2,2}^{1,1}\left(z \left| \begin{array}{c} a,\, a+\frac{1}{2} \\ a,\, a-\frac{1}{2} \end{array} \right.\right) = \frac{1}{\pi}\, z^{a-\frac{1}{2}} \log\left(\frac{\sqrt{z}+1}{\operatorname{sgn}(1-|z|)\left(1-\sqrt{z}\right)}\right) /;\, z \notin (-1, 0)$$

Case $\{m, n, p, q\} = \{1, 1, 2, 3\}$

07.34.03.0344.01

$$G_{2,3}^{1,1}\left(z \left| \begin{array}{c} a_1,\, a_2 \\ b_1,\, b_2,\, b_3 \end{array} \right.\right) = \frac{\Gamma(1-a_1+b_1)}{\Gamma(a_2-b_1)}\, z^{b_1}\, {}_2\tilde{F}_2(1-a_1+b_1,\, 1-a_2+b_1;\, b_1-b_2+1,\, b_1-b_3+1;\, z)$$

07.34.03.0345.01

$$G_{2,3}^{1,1}\left(z \left| \begin{array}{c} a,\, b \\ a,\, b,\, c \end{array} \right.\right) = \frac{\sin(\pi\,(b-a))}{\pi}\, e^z\, z^c\, Q(a-c,\, 0,\, z)$$

07.34.03.0346.01

$$G_{2,3}^{1,1}\left(z \left| \begin{array}{c} a,\, b \\ a,\, b,\, a-n \end{array} \right.\right) = \frac{\sin((b-a)\,\pi)}{\pi}\left(e^z - \sum_{k=0}^{n-1}\frac{z^k}{k!}\right) z^{a-n} /;\, n \in \mathbb{N}$$

07.34.03.0347.01

$$G_{2,3}^{1,1}\left(z \left| \begin{array}{c} a,\, b \\ a,\, b,\, a-1 \end{array} \right.\right) = \frac{\sin((b-a)\,\pi)}{\pi}\,(e^z-1)\, z^{a-1}$$

07.34.03.0348.01

$$G_{2,3}^{1,1}\left(z \middle| \begin{array}{c} a, a-\frac{1}{2} \\ b, 2a-b-1, a-\frac{1}{2} \end{array}\right) = -\frac{\cos((b-a)\pi)}{\sqrt{\pi}} z^{a-\frac{1}{2}} e^{z/2} I_{b-a+\frac{1}{2}}\left(\frac{z}{2}\right)$$

07.34.03.1085.01

$$G_{2,3}^{1,1}\left(z \middle| \begin{array}{c} a, a-\frac{1}{2} \\ a, a-1, a-\frac{1}{2} \end{array}\right) = -\frac{2}{\pi} e^{z/2} z^{a-1} \sinh\left(\frac{z}{2}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 2, 4\}$

07.34.03.0349.01

$$G_{2,4}^{1,1}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2, b_3, b_4 \end{array}\right) = \frac{\Gamma(b_1-a_1+1)}{\Gamma(a_2-b_1)} z^{b_1} \, {}_2\tilde{F}_3(b_1-a_1+1, b_1-a_2+1; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1; z)$$

07.34.03.0350.01

$$G_{2,4}^{1,1}\left(z \middle| \begin{array}{c} a, b \\ a, b, a-\frac{1}{2}, 2b-a-\frac{1}{2} \end{array}\right) = \frac{\sin((b-a)\pi)}{\pi} z^{b-\frac{1}{2}} \boldsymbol{L}_{2a-2b}\left(2\sqrt{z}\right)$$

07.34.03.0351.01

$$G_{2,4}^{1,1}\left(z \middle| \begin{array}{c} a, a \\ b, a, a-\frac{1}{2}, 2a-b-1 \end{array}\right) = \frac{\sin((a-b)\pi)}{\sqrt{\pi}} z^{a-\frac{1}{2}} I_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)^2$$

07.34.03.0352.01

$$G_{2,4}^{1,1}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, a-\frac{1}{2}, a+\frac{1}{2}, 2a-b \end{array}\right) = \frac{\cos((a-b)\pi)}{\sqrt{\pi}} z^{a} I_{b-a-\frac{1}{2}}\left(\sqrt{z}\right) I_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0353.01

$$G_{2,4}^{1,1}\left(z \middle| \begin{array}{c} a, a \\ a-\frac{1}{2}, b, a, 2a-b-1 \end{array}\right) = \frac{z^{a-\frac{1}{2}}}{\sqrt{\pi}} I_{a-b-\frac{1}{2}}\left(\sqrt{z}\right) I_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0354.01

$$G_{2,4}^{1,1}\left(z \middle| \begin{array}{c} a, a-1 \\ a-\frac{1}{2}, a-1, a-1, a-1 \end{array}\right) = -\frac{2z^{a-1}}{\pi^{3/2}} \operatorname{Shi}\left(2\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 4, 2\}$

07.34.03.0355.01

$$G_{4,2}^{1,1}\left(z \middle| \begin{array}{c} a_1, a_2, a_3, a_4 \\ b_1, b_2 \end{array}\right) = \frac{z^{a_1-1}\Gamma(b_1-a_1+1)}{\Gamma(a_1-b_2)} \, {}_2\tilde{F}_3\left(b_1-a_1+1, b_2-a_1+1; a_2-a_1+1, a_3-a_1+1, a_4-a_1+1; \frac{1}{z}\right)$$

07.34.03.0356.01

$$G_{4,2}^{1,1}\left(z \middle| \begin{array}{c} a, b-\frac{1}{2}, b+\frac{1}{2}, 2b-a \\ b, b-\frac{1}{2} \end{array}\right) = \frac{\cos((a-b)\pi)}{\sqrt{\pi}} z^{b-1} I_{b-a-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) I_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0357.01

$$G_{4,2}^{1,1}\left(z \middle| \begin{array}{c} a, b, b+\frac{1}{2}, 2b-a+1 \\ b, b \end{array}\right) = \frac{\sin((a-b)\pi)}{\sqrt{\pi}} z^{b-\frac{1}{2}} I_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2$$

07.34.03.0358.01

$$G_{4,2}^{1,1}\left(z \middle| \begin{matrix} a,\, b,\, a+\frac{1}{2},\, 2\,b-a+\frac{1}{2} \\ a,\, b \end{matrix}\right) = \frac{\sin((a-b)\,\pi)}{\pi}\, z^{b-\frac{1}{2}}\, \boldsymbol{L}_{2\,b-2\,a}\left(\frac{2}{\sqrt{z}}\right)$$

07.34.03.0359.01

$$G_{4,2}^{1,1}\left(z \middle| \begin{matrix} a,\, c,\, a-\frac{1}{2},\, 2\,a-c \\ a-\frac{1}{2},\, a-\frac{1}{2} \end{matrix}\right) = \frac{z^{a-1}}{\sqrt{\pi}}\, I_{a-c}\left(\frac{1}{\sqrt{z}}\right) I_{c-a}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0360.01

$$G_{4,2}^{1,1}\left(z \middle| \begin{matrix} a,\, a+\frac{1}{2},\, a+\frac{1}{2},\, a+\frac{1}{2} \\ a-\frac{1}{2},\, a+\frac{1}{2} \end{matrix}\right) = -\frac{2\, z^{a-\frac{1}{2}}}{\pi^{3/2}}\, \mathrm{Shi}\left(\frac{2}{\sqrt{z}}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 3, 1\}$

07.34.03.0361.01

$$G_{3,1}^{1,1}\left(z \middle| \begin{matrix} a_1,\, a_2,\, a_2 \\ b_1 \end{matrix}\right) = \Gamma(1-a_1+b_1)\, z^{a_1-1}\, {}_1\tilde{F}_2\left(1-a_1+b_1;\, 1-a_1+a_2,\, 1-a_1+a_2;\, -\frac{1}{z}\right)$$

07.34.03.0362.01

$$G_{3,1}^{1,1}\left(z \middle| \begin{matrix} a,\, c,\, b-1 \\ b \end{matrix}\right) = -z^{\frac{1}{2}(a+c-3)} \left((a-b)\sqrt{z}\, J_{c-a}\left(\frac{2}{\sqrt{z}}\right) + J_{c-a+1}\left(\frac{2}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty,\, 0)$$

07.34.03.0363.01

$$G_{3,1}^{1,1}\left(z \middle| \begin{matrix} a,\, c,\, a+\frac{1}{2} \\ a \end{matrix}\right) = z^{\frac{1}{4}(2\,a+2\,c-3)}\, \boldsymbol{H}_{c-a-\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right)$$

07.34.03.0364.01

$$G_{3,1}^{1,1}\left(z \middle| \begin{matrix} a,\, c,\, 2\,a-c-2 \\ a-\frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi}}{4}\, z^{a-2} \left(J_{a-c-2}\left(\frac{1}{\sqrt{z}}\right) J_{c-a}\left(\frac{1}{\sqrt{z}}\right) - 2\, J_{a-c-1}\left(\frac{1}{\sqrt{z}}\right) J_{c-a+1}\left(\frac{1}{\sqrt{z}}\right) + J_{a-c}\left(\frac{1}{\sqrt{z}}\right) J_{c-a+2}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0365.01

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

07.34.03.0366.01

$$G_{3,1}^{1,1}\left(z \middle| \begin{matrix} a,\, c,\, 2\,a-c-1 \\ a+\frac{1}{2} \end{matrix}\right) =$$
$$\frac{\sqrt{\pi}}{4}\, z^{a-2} \left(J_{a-c-1}\left(\frac{1}{\sqrt{z}}\right) \left(J_{c-a-1}\left(\frac{1}{\sqrt{z}}\right) + (2\,a-2\,c+1)\sqrt{z}\, J_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right) + J_{a-c+1}\left(\frac{1}{\sqrt{z}}\right) J_{c-a+1}\left(\frac{1}{\sqrt{z}}\right) - \right.$$
$$\left. J_{a-c}\left(\frac{1}{\sqrt{z}}\right) \left(2\, J_{c-a}\left(\frac{1}{\sqrt{z}}\right) + (2\,a-2\,c+1)\sqrt{z}\, J_{c-a+1}\left(\frac{1}{\sqrt{z}}\right)\right)\right)$$

07.34.03.0367.01

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

07.34.03.0368.01

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

07.34.03.0369.01

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

07.34.03.0370.01

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

07.34.03.0371.01

$$G_{3,1}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c, 2a-c+2 \\ a-\frac{1}{2} \end{matrix}\right) = -\frac{\sqrt{\pi}\, z^{a-1}}{4\left(c-a-\frac{3}{2}\right)\left(c-a-\frac{1}{2}\right)} \left(J_{a-c+1}\left(\frac{1}{\sqrt{z}}\right)\left(2\left(\left(2a^2+(3-4c)a+2c^2-3c+1\right)z+1\right) J_{c-a-1}\left(\frac{1}{\sqrt{z}}\right) + (2a-2c+1)\sqrt{z}\, J_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right) - J_{a-c}\left(\frac{1}{\sqrt{z}}\right)\left((2a-2c+1)\sqrt{z}\, J_{c-a-1}\left(\frac{1}{\sqrt{z}}\right) + 2 J_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right)\right)$$

07.34.03.0372.01

$$G_{3,1}^{1,1}\left(z \,\middle|\, \begin{matrix} a, c, 2a-c+2 \\ a+\frac{3}{2} \end{matrix}\right) = \frac{\sqrt{\pi}}{2} z^{a} \left(\frac{1}{\sqrt{z}}\left(\left(c-a-\frac{3}{2}\right) J_{a-c+1}\left(\frac{1}{\sqrt{z}}\right) + \frac{1}{\sqrt{z}} J_{a-c+2}\left(\frac{1}{\sqrt{z}}\right)\right) J_{c-a-2}\left(\frac{1}{\sqrt{z}}\right) - \frac{1}{2z}\left(2\left(\left(2a^2+(5-4c)a+2c^2-5c+3\right)z-1\right) J_{a-c+1}\left(\frac{1}{\sqrt{z}}\right) + (-2a+2c-3)\sqrt{z}\, J_{a-c+2}\left(\frac{1}{\sqrt{z}}\right)\right) J_{c-a-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0373.01

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

07.34.03.0374.01

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

07.34.03.0375.01

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

07.34.03.0376.01

$$G_{3,1}^{1,1}\left(z \,\middle|\, \begin{matrix} a, b-\frac{1}{2}, 2b-a+2 \\ b \end{matrix}\right) = \frac{\sqrt{\pi}\, z^{b-\frac{1}{2}}}{4(a-b-1)} \left((2a-2b-1) J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 + (2b-2a+3) J_{b-a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right)$$

07.34.03.0377.01

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

07.34.03.0378.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, 2b-a+1,\, b+\frac{1}{2} \\ b \end{matrix} \right.\right) = \sqrt{\pi}\, z^{b-\frac{1}{2}}\, J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2$$

07.34.03.0379.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, b+\frac{1}{2},\, 2b-a+2 \\ b \end{matrix} \right.\right) = \frac{\sqrt{\pi}\, z^{b-\frac{1}{2}}}{2(b-a+1)} \left(J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 + J_{b-a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right)$$

07.34.03.0380.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, b+\frac{3}{2},\, 2b-a+1 \\ b \end{matrix} \right.\right) = \sqrt{\pi}\, z^{b-\frac{1}{2}} \left(J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 - J_{b-a-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) J_{b-a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0381.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, b+\frac{3}{2},\, 2b-a+2 \\ b \end{matrix} \right.\right) = \frac{\sqrt{\pi}\, z^{b-\frac{1}{2}}}{b-a+1} \left(J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 + 2(a-b-1)\sqrt{z}\, J_{b-a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right) J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) + J_{b-a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right)$$

07.34.03.0382.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, a-\frac{1}{4},\, a+\frac{1}{4} \\ a \end{matrix} \right.\right) = \sqrt{\frac{2}{\pi}}\, z^{a-\frac{3}{4}} \left(\cos\left(\frac{2}{\sqrt{z}}\right) C\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right) + \sin\left(\frac{2}{\sqrt{z}}\right) S\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right)$$

07.34.03.0383.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, a+\frac{1}{4},\, a+\frac{3}{4} \\ a \end{matrix} \right.\right) = \sqrt{\frac{2}{\pi}}\, z^{a-\frac{1}{4}} \left(\sin\left(\frac{2}{\sqrt{z}}\right) C\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right) - \cos\left(\frac{2}{\sqrt{z}}\right) S\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right)$$

07.34.03.0384.01

$$G_{3,1}^{1,1}\left(z \left| \begin{matrix} a,\, a+\frac{1}{2},\, a+\frac{1}{2} \\ a-\frac{1}{2} \end{matrix} \right.\right) = \frac{2 z^{a-\frac{1}{2}}}{\sqrt{\pi}}\, \mathrm{Si}\left(\frac{2}{\sqrt{z}}\right)$$

Case $\{m, n, p, q\} = \{1, 1, 3, 2\}$

07.34.03.0385.01

$$G_{3,2}^{1,1}\left(z \left| \begin{matrix} a_1,\, a_2,\, a_2 \\ b_1,\, b_2 \end{matrix} \right.\right) = \frac{\Gamma(1-a_1+b_1)}{\Gamma(a_1-b_2)}\, z^{a_1-1}\, {}_2\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2;\, 1-a_1+a_2,\, 1-a_1+a_2;\, \frac{1}{z}\right)$$

07.34.03.0386.01

$$G_{3,2}^{1,1}\left(z \left| \begin{matrix} a,\, b,\, c \\ a,\, b \end{matrix} \right.\right) = \frac{\sin(\pi(a-b))}{\pi}\, e^{1/z}\, z^{c-1}\, Q\left(c-a,\, 0,\, \frac{1}{z}\right)$$

07.34.03.0387.01

$$G_{3,2}^{1,1}\left(z \left| \begin{matrix} a,\, b+\frac{1}{2},\, 2b-a+1 \\ b,\, b+\frac{1}{2} \end{matrix} \right.\right) = -\frac{\cos((b-a)\pi)}{\sqrt{\pi}}\, z^{b-\frac{1}{2}}\, e^{\frac{1}{2z}}\, I_{b-a+\frac{1}{2}}\left(\frac{1}{2z}\right)$$

07.34.03.0388.01

$$G_{3,2}^{1,1}\left(z \left| \begin{matrix} a,\, a+n,\, b \\ a,\, b \end{matrix} \right.\right) = \frac{\sin((a-b)\pi)}{\pi} \left(e^{1/z} - \sum_{k=0}^{n-1} \frac{z^{-k}}{k!}\right) z^{a+n-1} \,/;\, n \in \mathbb{N}$$

07.34.03.0389.01

$$G_{3,2}^{1,1}\left(z \,\middle|\, \begin{matrix} a,\, a+1,\, b \\ a,\, b \end{matrix}\right) = \frac{\sin((a-b)\pi)}{\pi} \left(e^{1/z}-1\right) z^a$$

Case $\{m, n, p, q\} = \{1, 1, 3, 3\}$

07.34.03.0390.01

$$G_{3,3}^{1,1}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2,\, a_3 \\ b_1,\, b_2,\, b_3 \end{matrix}\right) = \Gamma(1-a_1+b_1)\left(\frac{\theta(1-|z|)}{\Gamma(a_2-b_1)\,\Gamma(a_3-b_1)} z^{b_1}\, {}_3\tilde{F}_2(1-a_1+b_1,\, 1-a_2+b_1,\, 1-a_3+b_1;\, b_1-b_2+1,\, b_1-b_3+1;\, -z) + \frac{\theta(|z|-1)}{\Gamma(a_1-b_2)\,\Gamma(a_1-b_3)} z^{a_1-1}\, {}_3\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2,\, 1-a_1+b_3;\, 1-a_1+a_2,\, 1-a_1+a_3;\, -\frac{1}{z}\right)\right)$$

Case $\{m, n, p, q\} = \{1, 2, 2, 1\}$

07.34.03.0391.01

$$G_{2,1}^{1,2}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2 \\ b_1 \end{matrix}\right) = \Gamma(a_1-a_2)\,\Gamma(b_1-a_1+1)\, z^{a_1-1}\, {}_1F_1\left(b_1-a_1+1;\, -a_1+a_2+1;\, \frac{1}{z}\right) + \Gamma(a_2-a_1)\,\Gamma(b_1-a_2+1)\, z^{a_2-1}\, {}_1F_1\left(b_1-a_2+1;\, a_1-a_2+1;\, \frac{1}{z}\right) /;\, a_2-a_1 \notin \mathbb{Z}$$

07.34.03.0392.01

$$G_{2,1}^{1,2}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2 \\ b_1 \end{matrix}\right) = \Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\, z^{a_1-1}\, U\left(1-a_1+b_1,\, 1-a_1+a_2,\, \frac{1}{z}\right) /;\, z \notin (-1, 0)$$

07.34.03.0393.01

$$G_{2,1}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a \\ b \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((a-b)\pi)}{2} z^{b-\frac{3}{2}}\, e^{\frac{1}{2z}} \left(K_{b-a-\frac{1}{2}}\left(\frac{1}{2z}\right) - K_{b-a+\frac{1}{2}}\left(\frac{1}{2z}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0394.01

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

07.34.03.0395.01

$$G_{2,1}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a+2 \\ b \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((a-b)\pi)}{2(a-b-1)} z^{b-\frac{1}{2}}\, e^{\frac{1}{2z}} \left(K_{a-b-\frac{1}{2}}\left(\frac{1}{2z}\right) + K_{a-b-\frac{3}{2}}\left(\frac{1}{2z}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0396.01

$$G_{2,1}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, b \\ b \end{matrix}\right) = \Gamma(b-a+1)\, z^{a-1}\, e^{1/z}\, \Gamma\left(a-b,\, \frac{1}{z}\right)$$

07.34.03.0397.01

$$G_{2,1}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, b \\ b \end{matrix}\right) = \Gamma(b-a+1)\, z^{b-1}\, e^{1/z}\, E_{b-a+1}\left(\frac{1}{z}\right)$$

07.34.03.0398.01

$$G_{1,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a \\ a,\, a \end{matrix}\right) = -e^z z^a \left(\text{Ei}(-z) + \frac{1}{2}\left(\log\left(-\frac{1}{z}\right) - \log(-z)\right) + \log(z)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0399.01

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

Case $\{m, n, p, q\} = \{1, 2, 2, 2\}$

07.34.03.0400.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = z^{b_1}\, \Gamma(1-a_1+b_1)\, \Gamma(1-a_2+b_1)\, {}_2\tilde{F}_1(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1; -z)$$

07.34.03.0401.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = \frac{\pi \csc(\pi(a_1-b_1))\, \Gamma(b_1-a_2+1)}{\Gamma(a_1-b_2)}\, z^{b_1}\, P_{a_1-b_1-1}^{(b_1-b_2, b_1+b_2-a_1-a_2+1)}(2z+1)$$

07.34.03.0402.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, d \end{matrix}\right) = \Gamma(b-c+1)\, \Gamma(d-a+1)\, z^b\, (z+1)^{a-b+c-d-1}\, P_{d-a}^{(b-d, a-b+c-d-1)}(2z+1)$$

07.34.03.0403.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, d \end{matrix}\right) = \Gamma(d-c+1)\, \Gamma(b-a+1)\, z^b\, (z+1)^{a-b-1}\, P_{d-c}^{(b-d, c-a)}\left(\frac{1-z}{1+z}\right) /; z \notin (-\infty, -1)$$

07.34.03.0404.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a-1 \end{matrix}\right) = \Gamma(b-c+1)\, (-z)^{a-b-1}\, z^b\, \mathrm{B}_{-z}(b-a+1, c-b)$$

07.34.03.0405.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, a-1 \end{matrix}\right) = \frac{\pi \csc((c-b)\pi)\, \Gamma(b-a+1)}{\Gamma(c-a+1)}\, (-z)^{a-b-1}\, z^b\, I_{-z}(b-a+1, c-b)$$

07.34.03.0406.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \sqrt{\pi}\, \Gamma(b-c+1)\, z^{a-\frac{1}{2}}\, (z+1)^{\frac{1}{4}(2c-2a-1)}\, \mathfrak{P}_{c-a-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\frac{z+2}{2\sqrt{z+1}}\right) /; \operatorname{Re}(z) \geq 0$$

07.34.03.0407.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \frac{2\, e^{i(a-c)\pi}\, \Gamma(b-c+1)}{\Gamma(b+c-2a+1)}\, z^{a-1}\, (z+1)^{\frac{c-a}{2}}\, \mathfrak{Q}_{b-a}^{c-a}\left(\frac{z+2}{z}\right) /; z \notin (-1, 0)$$

07.34.03.0408.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = 2\, e^{i(c-a)\pi}\, z^{a-1}\, (z+1)^{\frac{c-a}{2}}\, \mathfrak{Q}_{b-a}^{a-c}\left(\frac{z+2}{z}\right) /; z \notin (-1, 0)$$

07.34.03.0409.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \Gamma(2a-b-c)\, \Gamma(b-a+1)\, z^b\, (z+1)^{\frac{c-b-1}{2}}\, C_{2a-b-c-1}^{b-a+1}\left(\frac{z+2}{2\sqrt{z+1}}\right)$$

07.34.03.0410.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, b-a+c \end{matrix}\right) = z^{b+\frac{c-a}{2}}\, (z+1)^{a-b-1}\, \Gamma(b-a+1)\, \Gamma(b-c+1)\, P_{a-b-1}^{c-a}\left(\frac{1-z}{1+z}\right) /; z \notin (-\infty, -1)$$

07.34.03.0411.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, c \\ b, -a+b+c \end{matrix}\right) = (a-c+1)_{b+c-2a}\, \Gamma(b+c-2a+1)\, \Gamma(2a-2c+1)\, z^b\, (z+1)^{c-b-1}\, C_{b+c-2a}^{a-c+\frac{1}{2}}\left(\frac{1-z}{1+z}\right) /; z \notin (-\infty, -1)$$

07.34.03.0412.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, a-b+c-\frac{3}{2} \end{matrix}\right) = 2^{2b-a-c+\frac{3}{2}}\, \Gamma(b-a+1)\, \Gamma(b-c+1)\, z^{\frac{1}{4}(2a+2c-3)}\, \mathfrak{P}_{a-c-\frac{1}{2}}^{a-2b+c-\frac{3}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1, 0)$$

07.34.03.0413.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, a-b+c-\frac{3}{2} \end{matrix}\right) = \frac{2^{c-a+1}\, e^{i(c-a)\pi}\, \Gamma(b-a+1)}{\Gamma\left(b-c+\frac{3}{2}\right)}\, z^{\frac{a+c}{2}-1}\, \mathfrak{Q}_{2b-a-c+1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.0414.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, a-b+c-\frac{1}{2} \end{matrix}\right) = \frac{2^{2b-a-c+\frac{1}{2}}\, \Gamma(b-a+1)\, \Gamma(b-c+1)}{\sqrt{z+1}}\, z^{\frac{1}{4}(2a+2c-1)}\, \mathfrak{P}_{c-a-\frac{1}{2}}^{a-2b+c-\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1, 0)$$

07.34.03.0415.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, a-b+c-\frac{1}{2} \end{matrix}\right) = \frac{2^{c-a+1}\, e^{i(c-a)\pi}\, \Gamma(b-a+1)}{\Gamma\left(b-c+\frac{1}{2}\right)\sqrt{z+1}}\, z^{\frac{a+c-1}{2}}\, \mathfrak{Q}_{2b-a-c}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.0416.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, \frac{a+c-1}{2} \end{matrix}\right) = 2^{2b-a-c+1}\sqrt{\pi}\, \csc((a-b)\pi)\, \Gamma\left(1+b-\frac{a+c}{2}\right) z^b\, C_{a-b-1}^{1+b-\frac{a+c}{2}}(2z+1)$$

07.34.03.0417.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, \frac{a+c-1}{2} \end{matrix}\right) = z^{\frac{a+2b+c-1}{4}}\, (z+1)^{\frac{a-2b+c-1}{4}}\, \Gamma(b-a+1)\, \Gamma(b-c+1)\, \mathfrak{P}_{\frac{c-a-1}{2}}^{\frac{a+c-1}{2}-b}(2z+1) /;\, z \notin (-1, 0)$$

07.34.03.0418.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, c \\ b,\, \frac{a+c-1}{2} \end{matrix}\right) = \frac{e^{\frac{\pi i}{2}(c-a)}\, \Gamma(b-a+1)}{\sqrt{\pi}}\, z^{\frac{1}{4}(a+2b+c-2)}\, (z+1)^{\frac{1}{4}(a-2b+c-2)}\, \mathfrak{Q}_{b-\frac{a+c}{2}}^{\frac{a-c}{2}}\left(\frac{2z+1}{2\sqrt{z}\,\sqrt{z+1}}\right) /;\, \mathrm{Re}(z) \geq 0$$

07.34.03.0419.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, 2b-a+1 \\ b,\, c \end{matrix}\right) = \pi\, z^{\frac{b+c}{2}}\, (z+1)^{\frac{b-c}{2}}\, \csc((a-b)\pi)\, \mathfrak{P}_{a-b-1}^{c-b}(2z+1) /;\, z \notin (-1, 0)$$

07.34.03.0420.01

$$\pi\, (-z)^{\frac{c-b}{2}}\, z^b\, (1+z)^{\frac{b-c}{2}}\, \csc((a-b)\pi)\, P_{a-b-1}^{c-b}(2z+1)$$

07.34.03.0421.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} 2b-a+1,\, a \\ b,\, c \end{matrix}\right) = \frac{e^{i\left(b-a+\frac{1}{2}\right)\pi}\sqrt{\pi}\, \csc((a-b)\pi)}{\Gamma(a-c)}\, z^{\frac{1}{4}(2b+2c-1)}\, (z+1)^{\frac{1}{4}(2b-2c-1)}\, \mathfrak{Q}_{b-c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\frac{2z+1}{2\sqrt{z}\,\sqrt{z+1}}\right) /;\, \mathrm{Re}(z) \geq 0$$

07.34.03.0422.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, 2b-a+1 \\ b,\, c \end{matrix}\right) = \frac{\pi \csc((a-b)\pi)\, \Gamma(2b-2c+1)\, \Gamma(a-2b+c)}{\Gamma(a-c)\, \Gamma(b-c+1)}\, z^b\, (z+1)^{b-c}\, C_{a-2b+c-1}^{b-c+\frac{1}{2}}(2z+1)$$

07.34.03.0423.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, c \end{matrix}\right) = 2^{2a-b-c}\sqrt{\pi}\, \Gamma(2b-2a+1)\, z^{\frac{b+c}{2}}\, (z+1)^{a-\frac{b+c+1}{2}}\, P_{2a-b-c-1}^{c-b}\left(\frac{1}{\sqrt{z+1}}\right)$$

07.34.03.0424.01

$$G_{2,2}^{1,2}\left(z \;\middle|\; \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, c \end{matrix}\right) = 4^{a-c}\, \Gamma\left(b-c+\frac{1}{2}\right) \Gamma(2c-2a+1)\, z^b\, (z+1)^{a-b-\frac{1}{2}}\, C_{2c-2a}^{b-c+\frac{1}{2}}\left(\frac{1}{\sqrt{z+1}}\right)$$

07.34.03.0425.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a \\ b, b \end{matrix}\right) = (b-a)!^2 z^b (z+1)^{a-b-1} P_{b-a}\left(\frac{1-z}{1+z}\right)$$

07.34.03.0426.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b-\frac{1}{2} \end{matrix}\right) = -2^{2a-2b+1} \Gamma(2b-2a) (z+1)^{a-b} z^{b-\frac{1}{2}} \sin\left(2(a-b)\tan^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0427.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b-\frac{1}{2} \end{matrix}\right) = 4^{a-b+1} \Gamma(2b-2a) z^b (z+1)^{a-b-1} U_{b-a-1}\left(\frac{1-z}{1+z}\right) /; z \notin (-\infty, -1)$$

07.34.03.0428.01

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

07.34.03.0429.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b \end{matrix}\right) = 4^{a-b} \sqrt{\pi}\, (2b-2a)!\, z^b (z+1)^{a-b-\frac{1}{2}} P_{2b-2a}\left(\frac{1}{\sqrt{z+1}}\right)$$

07.34.03.0430.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 2^{2a-2b} \Gamma(2b-2a+1) (z+1)^{a-b-\frac{1}{2}} z^b \cos\left((2a-2b-1)\tan^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0431.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 4^{a-b} (2b-2a)!\, z^b (z+1)^{a-b-\frac{1}{2}} T_{b-a+\frac{1}{2}}\left(\frac{1-z}{1+z}\right)$$

07.34.03.0432.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 4^{a-b} z^b (z+1)^{a-b-\frac{1}{2}} T_{2b-2a+1}\left(\frac{1}{\sqrt{z+1}}\right)$$

07.34.03.0433.01

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

07.34.03.0434.01

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

07.34.03.0435.01

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

07.34.03.0436.01

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

07.34.03.0437.01

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

07.34.03.0438.01

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

07.34.03.0439.01

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

07.34.03.0440.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, 2b-a+1 \\ b, b \end{matrix}\right) = \pi\csc((a-b)\pi)\, z^b\, P_{a-b-1}(2z+1)$$

07.34.03.0441.01

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

07.34.03.0442.01

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

07.34.03.0443.01

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

07.34.03.0444.01

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

07.34.03.0445.01

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

07.34.03.0446.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, b \\ b, b-1 \end{matrix}\right) = \Gamma(b-a)\, z^b\, (z+1)^{\frac{a-b}{2}-1}\, (z+2)\, U_{\frac{b-a}{2}-1}\left(\frac{z^2+2z+2}{2z+2}\right) /;\, z \notin (-\infty, -1)$$

07.34.03.0447.01

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

07.34.03.0448.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, 3a-2b-\frac{3}{2} \\ b, 4a-3b-3 \end{matrix}\right) =$$

$$\frac{2^{6b-6a+5}\,\Gamma(b-a+1)\,\Gamma\left(3b-3a+\frac{5}{2}\right)}{\Gamma(4b-4a+4)}\, z^b\, (z+4)^{3a-3b-\frac{5}{2}}\, {}_2F_1\left(b-a+\frac{5}{6}, b-a+\frac{7}{6}; 2b-2a+\frac{5}{2}; \frac{27z^2}{(z+4)^3}\right)$$

07.34.03.0449.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, 3a-2b-\frac{1}{2} \\ b,\, b-\frac{1}{2} \end{matrix}\right) = \frac{2\, 3^{3b-3a+\frac{1}{2}}\, \Gamma(b-a+1)\, \Gamma\left(3b-3a+\frac{3}{2}\right)}{\sqrt{\pi}} (3-z)^{3a-3b-\frac{5}{2}} z^b (z+9)\, {}_2F_1\left(b-a+\frac{5}{6},\, b-a+\frac{7}{6};\, \frac{3}{2};\, \frac{z(z+9)^2}{(z-3)^3}\right) /;\, |z|<1 \lor \operatorname{Re}(z)>0$$

07.34.03.0450.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, 4b-3a+1 \\ b,\, b-\frac{1}{2} \end{matrix}\right) = \frac{2\, 3^{3a-3b-1}\, \Gamma(3a-3b)\, \Gamma(b-a+1)}{\sqrt{\pi}} z^b (4z+3)^{-3a+3b-1} (8z+9)\, {}_2F_1\left(a-b+\frac{1}{3},\, a-b+\frac{2}{3};\, \frac{3}{2};\, \frac{z(8z+9)^2}{(4z+3)^3}\right) /;\, |z|<1 \lor \operatorname{Re}(z)\geq 0$$

07.34.03.0451.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, 4b-3a+3 \\ b,\, b+\frac{1}{2} \end{matrix}\right) = \frac{\Gamma(3a-3b-2)\, \Gamma(b-a+1)}{\sqrt{\pi}} z^b (z+1)^{b-a+\frac{2}{3}}\, {}_2F_1\left(a-b-\frac{2}{3},\, b-a+\frac{5}{6};\, \frac{1}{2};\, -\frac{z(8z+9)^2}{27(z+1)}\right) /;\, |z|<1 \lor \operatorname{Re}(z)>0$$

07.34.03.0452.01

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

07.34.03.0453.01

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

07.34.03.0454.01

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

07.34.03.0455.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2} \end{matrix}\right) = 2 z^{a-\frac{1}{2}} K(-z)$$

07.34.03.0456.01

$$G_{2,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a,\, a \\ a,\, a-1 \end{matrix}\right) = z^{a-1} \log(1+z)$$

07.34.03.0457.01

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

07.34.03.0458.01

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

07.34.03.0459.01

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

07.34.03.0460.01

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

07.34.03.0461.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a-\frac{1}{2}, a-\frac{1}{2} \end{matrix}\right) = -4 z^{a-\frac{1}{2}} K(-z)$$

07.34.03.0462.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a-\frac{1}{2}, a-\frac{1}{2} \end{matrix}\right) = -4 z^{a-\frac{1}{2}} \sqrt{z+1}\, E\left(\frac{z}{z+1}\right)$$

07.34.03.0463.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a+\frac{1}{4}, a+\frac{1}{4} \end{matrix}\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2 \pi \sqrt{z+1} \sqrt{\sqrt{z+1} - \sqrt{z}}} z^{a+\frac{1}{4}} E\left(2 \sqrt{z} \sqrt{z+1} - 2 z\right) /; z \notin (-\infty, -1)$$

07.34.03.0464.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a+\frac{1}{4}, a+\frac{1}{4} \end{matrix}\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2 \pi \sqrt{z+1}} z^{a+\frac{1}{4}} \sqrt{\sqrt{z} + \sqrt{z+1}}\, E\left(2 \sqrt{z} \sqrt{z+1} - 2 z\right) /; z \notin (-\infty, -1)$$

07.34.03.0465.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a+\frac{1}{4}, a+\frac{1}{4} \end{matrix}\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2 \pi \sqrt{z+1} \sqrt{\sqrt{z+1} - \sqrt{z}}} z^{a+\frac{1}{4}} E\left(\frac{2 \sqrt{z}}{\sqrt{z} + \sqrt{z+1}}\right) /; z \notin (-\infty, -1)$$

07.34.03.0466.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a+\frac{1}{4}, a+\frac{1}{4} \end{matrix}\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2 \pi \sqrt{z+1}} z^{a+\frac{1}{4}} \sqrt{\sqrt{z} + \sqrt{z+1}}\, E\left(\frac{2 \sqrt{z}}{\sqrt{z} + \sqrt{z+1}}\right) /; z \notin (-\infty, -1)$$

07.34.03.0467.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a+\frac{1}{4}, a+\frac{1}{4} \end{matrix}\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2 \pi \sqrt{z+1}} z^{a+\frac{1}{4}} \sqrt{\sqrt{z+1} - \sqrt{z}}\, E\left(\frac{2 \sqrt{z}}{\sqrt{z} - \sqrt{z+1}}\right)$$

07.34.03.0468.01

$$G_{2,2}^{1,2}\left(z \middle| \begin{matrix} a, a+1 \\ a+\frac{1}{4}, a+\frac{1}{4} \end{matrix}\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2 \pi \sqrt{z+1} \sqrt{\sqrt{z} + \sqrt{z+1}}} z^{a+\frac{1}{4}} E\left(\frac{2 \sqrt{z}}{\sqrt{z} - \sqrt{z+1}}\right)$$

07.34.03.0469.01

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

07.34.03.0470.01

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

07.34.03.1086.01

$$G_{2,2}^{1,2}\left(z \left| \begin{array}{c} a,\, b+n \\ b+n,\, b-1 \end{array} \right.\right) = (-1)^{n-1}\,\Gamma(b-a)\,z^{b-1}\left((z+1)^{a-b} - \sum_{k=0}^{n}\binom{a-b}{k} z^k\right) /;\, n \in \mathbb{N}$$

07.34.03.1087.01

$$G_{2,2}^{1,2}\left(z \left| \begin{array}{c} a,\, a+n \\ a+n,\, a-1 \end{array} \right.\right) = (-1)^{n}\,z^{a-1}\left(\log(z+1) - \sum_{k=1}^{n}\frac{(-1)^{k-1} z^k}{k}\right) /;\, n \in \mathbb{N}^+$$

Case $\{m, n, p, q\} = \{1, 2, 2, 3\}$

07.34.03.0471.01

$$G_{2,3}^{1,2}\left(z \left| \begin{array}{c} a_1,\, a_2 \\ b_1,\, b_2,\, b_3 \end{array} \right.\right) = \Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\,z^{b_1}\,{}_2\tilde{F}_2(1-a_1+b_1,\, 1-a_2+b_1;\, b_1-b_2+1,\, b_1-b_3+1;\, -z)$$

07.34.03.0472.01

$$G_{2,3}^{1,2}\left(z \left| \begin{array}{c} a,\, c \\ b,\, a+1,\, d \end{array} \right.\right) = \frac{(b-a)\,\Gamma(b-c+1)}{\Gamma(b-d+1)}\,z^b\left({}_1F_1(b-c+1;\, b-d+1;\, -z) + \frac{(b-c+1)\,z}{(a-b)\,(b-d+1)}\,{}_1F_1(b-c+2;\, b-d+2;\, -z)\right)$$

07.34.03.0473.01

$$G_{2,3}^{1,2}\left(z \left| \begin{array}{c} a,\, c \\ b,\, a-1,\, c-1 \end{array} \right.\right) = \frac{z^b}{(b-a+1)\,(a-c)\,(b-c+1)}\,((b-c+1)\,{}_1F_1(b-a+1;\, b-a+2;\, -z) + (a-b-1)\,{}_1F_1(b-c+1;\, b-c+2;\, -z))$$

07.34.03.0474.01

$$G_{2,3}^{1,2}\left(z \left| \begin{array}{c} a,\, b \\ b,\, b-1,\, c \end{array} \right.\right) = \frac{\Gamma(b-a)}{z\,\Gamma(b-c)}\,z^b\,(1 - {}_1F_1(b-a;\, b-c;\, -z))$$

07.34.03.0475.01

$$G_{2,3}^{1,2}\left(z \left| \begin{array}{c} a,\, a \\ a,\, a-1,\, a-1 \end{array} \right.\right) = z^{a-1}\,(\Gamma(0,\, z) + \log(z) + \gamma)$$

07.34.03.0476.01

$$G_{2,3}^{1,2}\left(z \left| \begin{array}{c} a,\, a \\ a,\, a-1,\, a-1 \end{array} \right.\right) = z^{a-1}\left(-\mathrm{Ei}(-z) - \frac{1}{2}\left(\log\left(-\frac{1}{z}\right) - \log(-z)\right) + \gamma\right)$$

Case $\{m, n, p, q\} = \{1, 2, 2, 4\}$

07.34.03.0477.01

$$G_{2,4}^{1,2}\left(z \left| \begin{array}{c} a_1,\, a_2 \\ b_1,\, b_2,\, b_3,\, b_4 \end{array} \right.\right) = z^{b_1}\,\Gamma(b_1-a_1+1)\,\Gamma(b_1-a_2+1)\,{}_2\tilde{F}_3(b_1-a_1+1,\, b_1-a_2+1;\, b_1-b_2+1,\, b_1-b_3+1,\, b_1-b_4+1;\, -z)$$

07.34.03.0478.01

$$G_{2,4}^{1,2}\left(z \left| \begin{array}{c} a,\, c \\ b,\, \frac{a+c-1}{2},\, \frac{a+c}{2},\, a-b+c-1 \end{array} \right.\right) = \frac{2^{2b-a-c+1}\,\Gamma(b-a+1)\,\Gamma(b-c+1)}{\sqrt{\pi}\,\Gamma(2b-a-c+2)^2}\,z^b\,{}_1F_1\left(b-a+1;\, 2b-a-c+2;\, -2\,i\sqrt{z}\right)\,{}_1F_1\left(b-a+1;\, 2b-a-c+2;\, 2\,i\sqrt{z}\right)$$

07.34.03.0479.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, c \\ b, \frac{a+c-1}{2}, \frac{a+c}{2}, a-b+c-1 \end{matrix} \right.\right) = \frac{2^{2b-a-c+1}\,\Gamma(b-a+1)\,\Gamma(b-c+1)}{\sqrt{\pi}\,\Gamma(2b-a-c+2)^2} z^b\, {}_1F_1\left(b-a+1; 2b-a-c+2; -2\sqrt{-z}\right) {}_1F_1\left(b-a+1; 2b-a-c+2; 2\sqrt{-z}\right)$$

07.34.03.0480.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, c, 2a-b, 2a-c \end{matrix} \right.\right) = \frac{4^{a-b}\sqrt{\pi}\, z^b}{\Gamma(b-c+1)\,\Gamma(b+c-2a+1)} {}_0F_1\left(; b-c+1; -\frac{z}{4}\right) {}_0F_1\left(; b+c-2a+1; -\frac{z}{4}\right)$$

07.34.03.0481.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, c, 2a-b, 2a-c \end{matrix} \right.\right) = 4^{a-b}\sqrt{\pi}\, z^b\, {}_0\tilde{F}_1\left(; b-c+1; -\frac{z}{4}\right) {}_0\tilde{F}_1\left(; b+c-2a+1; -\frac{z}{4}\right)$$

07.34.03.0482.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, c, 2a-b, 2a-c \end{matrix} \right.\right) = \frac{4^{a-b}\sqrt{\pi}}{\Gamma(b-c+1)\,\Gamma(b+c-2a+1)} z^b\, {}_1F_1\left(b-c+\frac{1}{2}; 2b-2c+1; -2\sqrt{-z}\right) {}_1F_1\left(b+c-2a+\frac{1}{2}; 2b+2c-4a+1; 2\sqrt{-z}\right)$$

07.34.03.0483.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a+\frac{1}{2}, a \\ b, c, 2a-b, 2a-c \end{matrix} \right.\right) = \sqrt{\pi}\, z^a\, J_{b-c}\left(\sqrt{z}\right) J_{b+c-2a}\left(\sqrt{z}\right)$$

07.34.03.0484.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, c, b-\frac{1}{2}, c+\frac{1}{2} \end{matrix} \right.\right) = \frac{2^{2a-2c-1}\,\Gamma(2b-2a)}{\sqrt{\pi}\,\sqrt{-z}} z^b \left({}_1\tilde{F}_1\left(2b-2a; 2b-2c; 2\sqrt{-z}\right) - {}_1\tilde{F}_1\left(2b-2a; 2b-2c; -2\sqrt{-z}\right)\right)$$

07.34.03.0485.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, c, b+\frac{1}{2}, c+\frac{1}{2} \end{matrix} \right.\right) = \frac{2^{2a-2c-1}\,\Gamma(-2a+2b+1)}{\sqrt{\pi}} z^b \left({}_1\tilde{F}_1\left(2b-2a+1; 2b-2c+1; -2\sqrt{-z}\right) + {}_1\tilde{F}_1\left(2b-2a+1; 2b-2c+1; 2\sqrt{-z}\right)\right)$$

07.34.03.0486.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, 2a-b-\frac{1}{2}, 2a-b, b+\frac{1}{2} \end{matrix} \right.\right) = \sqrt{2}\, z^{a-\frac{1}{4}} \cos\left(\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0487.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, 2a-b-\frac{1}{2}, 2a-b, b+\frac{1}{2} \end{matrix} \right.\right) = 4^{a-b} z^b \cos\left(\sqrt{z}\right) {}_0\tilde{F}_1\left(; 2b-2a+\frac{3}{2}; -\frac{z}{4}\right)$$

07.34.03.0488.01

$$G_{2,4}^{1,2}\left(z \left| \begin{matrix} a, a+\frac{1}{2} \\ b, 2a-b, 2a-b+\frac{1}{2}, b-\frac{1}{2} \end{matrix} \right.\right) = \frac{2^{2a-2b+1}}{\Gamma\left(2b-2a+\frac{1}{2}\right)} z^{b-\frac{1}{2}} \sin\left(\sqrt{z}\right) {}_0F_1\left(; 2b-2a+\frac{1}{2}; -\frac{z}{4}\right)$$

07.34.03.0489.01

$$G_{2,4}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, 2a-b+\frac{1}{2},\, b-\frac{1}{2} \end{array}\right) = \sqrt{2}\, z^{a-\frac{1}{4}} \sin\left(\sqrt{z}\right) J_{2b-2a-\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0490.01

$$G_{2,4}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2} \\ a,\, a+\frac{1}{4},\, a-\frac{1}{4},\, a-\frac{1}{2} \end{array}\right) = \sqrt{2}\, z^{a-\frac{1}{2}} \left(C\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)^2 + S\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)^2\right)$$

Case $\{m, n, p, q\} = \{1, 2, 3, 5\}$

07.34.03.0491.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a_1,\, a_2,\, a_3 \\ b_1,\, b_2,\, b_3,\, b_4,\, b_5 \end{array}\right) = \frac{\Gamma(b_1-a_1+1)\,\Gamma(b_1-a_2+1)}{\Gamma(a_3-b_1)} z^{b_1}\, {}_3\tilde{F}_4(b_1-a_1+1,\, b_1-a_2+1,\, b_1-a_3+1;\, b_1-b_2+1,\, b_1-b_3+1,\, b_1-b_4+1,\, b_1-b_5+1;\, z)$$

07.34.03.1088.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, b \\ b-\frac{1}{2},\, c,\, b,\, 2a-b+\frac{1}{2},\, 2a-c \end{array}\right) = \frac{z^a}{\sqrt{\pi}} I_{b-c-\frac{1}{2}}\left(\sqrt{z}\right) I_{-2a+b+c-\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0492.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, a+\frac{1}{4} \\ b,\, c,\, a+\frac{1}{4},\, 2a-b,\, 2a-c \end{array}\right) = \frac{\sin\left(\left(b-a+\frac{3}{4}\right)\pi\right)}{\sqrt{\pi}} z^a I_{b-c}\left(\sqrt{z}\right) I_{b+c-2a}\left(\sqrt{z}\right)$$

07.34.03.0493.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, a-\frac{1}{4} \\ b,\, a-\frac{1}{4},\, b-\frac{1}{2},\, 2a-b,\, 2a-b+\frac{1}{2} \end{array}\right) = \frac{\sqrt{2}\,\sin\left(\left(a-b-\frac{1}{4}\right)\pi\right)}{\pi} z^{a-\frac{1}{4}} \sinh\left(\sqrt{z}\right) I_{2b-2a-\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0494.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, a-\frac{1}{4} \\ b,\, a-\frac{1}{4},\, b+\frac{1}{2},\, 2a-b-\frac{1}{2},\, 2a-b \end{array}\right) = \frac{\sqrt{2}}{\pi} \cos\left(\left(b-a+\frac{3}{4}\right)\pi\right) z^{a-\frac{1}{4}} \cosh\left(\sqrt{z}\right) I_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0495.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, a-\frac{1}{2} \\ a,\, a-\frac{1}{4},\, a+\frac{1}{4},\, a-\frac{1}{2},\, a-\frac{1}{2} \end{array}\right) = -\frac{z^{a-\frac{1}{2}}}{\sqrt{2}\,\pi} \operatorname{erf}\left(\sqrt{2}\sqrt[4]{z}\right) \operatorname{erfi}\left(\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.1089.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, b \\ b-\frac{1}{2},\, b,\, \frac{b}{2},\, \frac{b+1}{2},\, b \end{array}\right) = \frac{2^{2a-b-1} z^{b-\frac{1}{2}}\, \Gamma(2b-2a)}{\pi^{3/2}\, \Gamma(b)} \left({}_1F_1\left(2b-2a;\, b;\, -2\sqrt{z}\right) + {}_1F_1\left(2b-2a;\, b;\, 2\sqrt{z}\right)\right)$$

07.34.03.1090.01

$$G_{3,5}^{1,2}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, b \\ b-\frac{1}{2},\, b-1,\, b,\, \frac{b-1}{2},\, \frac{b}{2} \end{array}\right) = -\frac{2^{2a-b} z^{b-1}\, \Gamma(-2a+2b-1)}{\pi^{3/2}\, \Gamma(b)} \left({}_1F_1\left(-2a+2b-1;\, b;\, -2\sqrt{z}\right) - {}_1F_1\left(-2a+2b-1;\, b;\, 2\sqrt{z}\right)\right)$$

Case $\{m, n, p, q\} = \{1, 2, 4, 2\}$

07.34.03.0496.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2 \end{matrix}\right) = \pi \csc(\pi(a_1 - a_2)) \left(\frac{\Gamma(b_1 - a_1 + 1)}{\Gamma(a_1 - b_2)} z^{a_1 - 1} {}_2\tilde{F}_3\left(b_1 - a_1 + 1, b_2 - a_1 + 1; a_2 - a_1 + 1, a_3 - a_1 + 1, a_4 - a_1 + 1; -\frac{1}{z}\right) - \frac{\Gamma(b_1 - a_2 + 1)}{\Gamma(a_2 - b_2)} z^{a_2 - 1} {}_2\tilde{F}_3\left(b_1 - a_2 + 1, b_2 - a_2 + 1; a_1 - a_2 + 1, a_3 - a_2 + 1, a_4 - a_2 + 1; -\frac{1}{z}\right)\right) /; a_1 - a_2 \notin \mathbb{Z}$$

07.34.03.0497.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, 2b - a, c, 2b - c \\ b, b - \frac{1}{2} \end{matrix}\right) = -\frac{\sqrt{\pi} \csc((b - a)\pi)}{2} z^{b-1} \left(J_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) J_{c-a}\left(\frac{1}{\sqrt{z}}\right) - J_{a-c}\left(\frac{1}{\sqrt{z}}\right) J_{a-2b+c}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0498.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, 2b - a + 1, c, 2b - c + 1 \\ b, b + \frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi} \csc((a - b)\pi)}{2} z^{b-\frac{1}{2}} \left(J_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) J_{c-a}\left(\frac{1}{\sqrt{z}}\right) + J_{a-c}\left(\frac{1}{\sqrt{z}}\right) J_{a-2b+c-1}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0499.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, 2b - a, a - \frac{1}{2}, 2b - a + \frac{1}{2} \\ b, b - \frac{1}{2} \end{matrix}\right) = \frac{\csc((a - b)\pi)}{\sqrt{2}} z^{b-\frac{3}{4}} \left(\cos\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) - \sin\left(\frac{1}{\sqrt{z}}\right) J_{2a-2b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0500.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, 2b - a + 1, a - \frac{1}{2}, 2b - a + \frac{3}{2} \\ b, b + \frac{1}{2} \end{matrix}\right) = \frac{\csc((a - b)\pi)}{\sqrt{2}} z^{b-\frac{1}{4}} \left(\cos\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right) + \sin\left(\frac{1}{\sqrt{z}}\right) J_{2a-2b-\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0501.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, 2b - a + 1, b + \frac{1}{2}, b + \frac{1}{2} \\ b, b + \frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi}}{2} \csc((a - b)\pi) z^{b-\frac{1}{2}} \left(J_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 + J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right) /; z \notin (-\infty, 0)$$

07.34.03.0502.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, b - 1, b + 1, 2b - a \\ b, b - \frac{1}{2} \end{matrix}\right) = \sqrt{\pi} z^{b-1} J_{b-a+1}\left(\frac{1}{\sqrt{z}}\right) Y_{b-a-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0503.01

$$G_{4,2}^{1,2}\left(z \middle| \begin{matrix} a, b, b + 1, -a + 2b + 1 \\ b, b + \frac{1}{2} \end{matrix}\right) = \sqrt{\pi} z^{b-\frac{1}{2}} J_{b-a+1}\left(\frac{1}{\sqrt{z}}\right) Y_{b-a}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0504.01

$$G_{4,2}^{1,2}\left(z\left|\begin{matrix}a,\,b+\frac{1}{2},\,a+\frac{1}{2},\,a+2\,b-a+1\\ b,\,a+\frac{1}{2}\end{matrix}\right.\right)=\sqrt{\pi}\;z^{b-\frac{1}{2}}\,J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)Y_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)/;\,z\notin(-\infty,\,0)$$

07.34.03.0505.01

$$G_{4,2}^{1,2}\left(z\left|\begin{matrix}a,\,a,\,a-\frac{1}{2},\,a-\frac{1}{2}\\ a,\,a-\frac{1}{2}\end{matrix}\right.\right)=-\frac{2\,z^{a-1}}{\pi^{3/2}}\left(\cos\left(\frac{2}{\sqrt{z}}\right)\mathrm{Ci}\left(\frac{2}{\sqrt{z}}\right)+\sin\left(\frac{2}{\sqrt{z}}\right)\mathrm{Si}\left(\frac{2}{\sqrt{z}}\right)\right)/;\,z\notin(-\infty,\,0)$$

07.34.03.0506.01

$$G_{4,2}^{1,2}\left(z\left|\begin{matrix}a,\,a,\,a-\frac{1}{2},\,a+\frac{1}{2}\\ a,\,a-\frac{1}{2}\end{matrix}\right.\right)=\frac{2\,z^{a-\frac{1}{2}}}{\pi^{3/2}}\left(\cos\left(\frac{2}{\sqrt{z}}\right)\mathrm{Si}\left(\frac{2}{\sqrt{z}}\right)-\sin\left(\frac{2}{\sqrt{z}}\right)\mathrm{Ci}\left(\frac{2}{\sqrt{z}}\right)\right)/;\,z\notin(-\infty,\,0)$$

Case $\{m, n, p, q\} = \{1, 2, 3, 1\}$

07.34.03.0507.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a_1,\,a_2,\,a_3\\ b_1\end{matrix}\right.\right)=\pi\csc(\pi\,(a_1-a_2))\left(\Gamma(1-a_1+b_1)\,z^{a_1-1}\,{}_1\tilde{F}_2\left(1-a_1+b_1;\,1-a_1+a_2,\,1-a_1+a_3;\,\frac{1}{z}\right)-\Gamma(1-a_2+b_1)\,z^{a_2-1}\,{}_1\tilde{F}_2\left(1-a_2+b_1;\,a_1-a_2+1,\,1-a_2+a_3;\,\frac{1}{z}\right)\right)/;\,a_2-a_1\notin\mathbb{Z}$$

07.34.03.0508.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a,\,c,\,a+\frac{1}{2}\\ a\end{matrix}\right.\right)=\pi\,z^{\frac{1}{4}(2\,a+2\,c-3)}\csc((c-a)\,\pi)\left(I_{a-c+\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right)-\boldsymbol{L}_{c-a-\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right)\right)/;\,z\notin(-\infty,\,0)$$

07.34.03.0509.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a,\,a+\frac{1}{2},\,c\\ a\end{matrix}\right.\right)=\pi\,z^{\frac{1}{2}\left(a+c-\frac{3}{2}\right)}\left(I_{c-a-\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right)-\boldsymbol{L}_{c-a-\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right)\right)/;\,z\notin(-\infty,\,0)$$

07.34.03.0510.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a,\,2\,b-a+1,\,b+\frac{1}{2}\\ b\end{matrix}\right.\right)=\pi^{3/2}\csc(2\,(a-b)\,\pi)\,z^{b-\frac{1}{2}}\left(I_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2-I_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right)/;\,z\notin(-\infty,\,0)$$

07.34.03.0511.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a,\,2\,b-a+1,\,b+\frac{1}{2}\\ b\end{matrix}\right.\right)=\sqrt{\pi}\;z^{b-\frac{1}{2}}\csc((a-b)\,\pi)\left(I_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)+I_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right)K_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0512.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a,\,b+\frac{1}{2},\,2\,b-a+1\\ b\end{matrix}\right.\right)=2\sqrt{\pi}\;z^{b-\frac{1}{2}}\,I_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)K_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0513.01

$$G_{3,1}^{1,2}\left(z\left|\begin{matrix}a,\,a+\frac{1}{2},\,b+1\\ b\end{matrix}\right.\right)=4^{a-b}\sqrt{\pi}\;z^b\,\Gamma\left(2\,b-2\,a+1,\,0,\,\frac{2}{\sqrt{z}}\right)/;\,z\notin(-\infty,\,0)$$

Case $\{m, n, p, q\} = \{1, 2, 3, 2\}$

07.34.03.0514.01

$$G_{3,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2 \end{matrix}\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{\Gamma(1 - a_1 + b_1)}{\Gamma(a_1 - b_2)} z^{a_1 - 1} {}_2\tilde{F}_2\left(1 - a_1 + b_1, 1 - a_1 + b_2; 1 - a_1 + a_2, 1 - a_1 + a_3; -\frac{1}{z}\right) - \frac{\Gamma(1 - a_2 + b_1)}{\Gamma(a_2 - b_2)} z^{a_2 - 1} {}_2\tilde{F}_2\left(1 - a_2 + b_1, 1 - a_2 + b_2; a_1 - a_2 + 1, 1 - a_2 + a_3; -\frac{1}{z}\right)\right) /; a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0515.01

$$G_{3,2}^{1,2}\left(z \,\middle|\, \begin{matrix} a, a, a - \frac{1}{2} \\ a, a - \frac{1}{2} \end{matrix}\right) = -\frac{z^{a-1}}{\pi} e^{-\frac{1}{z}} \operatorname{Ei}\left(\frac{1}{z}\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{1, 2, 3, 3\}$

07.34.03.0516.01

$$G_{3,3}^{1,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{matrix}\right) = \frac{\csc(\pi (a_1 - a_2))}{\pi} \left(\sin(\pi (a_1 - b_2)) \sin(\pi (a_1 - b_3)) \Gamma(1 - a_1 + b_1) \Gamma(1 - a_1 + b_2) \Gamma(1 - a_1 + b_3) z^{a_1 - 1} {}_3\tilde{F}_2\left(1 - a_1 + b_1, 1 - a_1 + b_2, 1 - a_1 + b_3; 1 - a_1 + a_2, 1 - a_1 + a_3; \frac{1}{z}\right) - \sin(\pi (a_2 - b_2)) \sin(\pi (a_2 - b_3)) \Gamma(1 - a_2 + b_1) \Gamma(1 - a_2 + b_2) \Gamma(1 - a_2 + b_3) z^{a_2 - 1} {}_3\tilde{F}_2\left(1 - a_2 + b_1, 1 - a_2 + b_2, 1 - a_2 + b_3; a_1 - a_2 + 1, 1 - a_2 + a_3; \frac{1}{z}\right)\right) \theta(|z| - 1) + \frac{\sin(\pi (a_3 - b_1))}{\pi} \Gamma(1 - a_1 + b_1) \Gamma(1 - a_2 + b_1) \Gamma(1 - a_3 + b_1) z^{b_1} {}_3\tilde{F}_2(1 - a_1 + b_1, 1 - a_2 + b_1, 1 - a_3 + b_1; b_1 - b_2 + 1, b_1 - b_3 + 1; z) \theta(1 - |z|) /; a_2 - a_1 \notin \mathbb{Z}$$

07.34.03.0517.01

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

Case $\{m, n, p, q\} = \{1, 3, 3, 1\}$

07.34.03.0518.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1 \end{matrix}\right) = \pi^2 \left(\csc(\pi (a_1 - a_2)) \csc(\pi (a_1 - a_3)) \Gamma(1 - a_1 + b_1) z^{a_1 - 1} {}_1\tilde{F}_2\left(1 - a_1 + b_1; 1 - a_1 + a_2, 1 - a_1 + a_3; -\frac{1}{z}\right) + \csc(\pi (a_2 - a_1)) \csc(\pi (a_2 - a_3)) \Gamma(1 - a_2 + b_1) z^{a_2 - 1} {}_1\tilde{F}_2\left(1 - a_2 + b_1; a_1 - a_2 + 1, 1 - a_2 + a_3; -\frac{1}{z}\right) + \csc(\pi (a_3 - a_1)) \csc(\pi (a_3 - a_2)) \Gamma(1 - a_3 + b_1) z^{a_3 - 1} {}_1\tilde{F}_2\left(1 - a_3 + b_1; a_1 - a_3 + 1, a_2 - a_3 + 1; -\frac{1}{z}\right)\right) /; a_2 - a_1 \notin \mathbb{Z} \land a_3 - a_1 \notin \mathbb{Z} \land a_3 - a_2 \notin \mathbb{Z}$$

07.34.03.0519.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a, b + \frac{1}{2}, 2b - a + 1 \\ b \end{matrix}\right) = \frac{\pi^{5/2} \csc((a - b) \pi)}{2} z^{b - \frac{1}{2}} \left(J_{b - a + \frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2 + Y_{b - a + \frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)^2\right) /; z \notin (-\infty, 0)$$

07.34.03.0520.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, b+\frac{1}{2},\, 2b-a+1 \\ b \end{matrix}\right) = 2\sqrt{\pi}\,\csc((a-b)\pi)\, z^{b-\frac{1}{2}} K_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{-z}}\right) K_{b-a+\frac{1}{2}}\left(-\frac{1}{\sqrt{-z}}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0521.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, b+\frac{1}{2},\, 2b-a+1 \\ b \end{matrix}\right) = \pi^{5/2}\csc(2(a-b)\pi)\, z^{b-\frac{1}{2}} \left(J_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) - J_{a-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{b-a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0522.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, b,\, b+\frac{1}{2} \\ b \end{matrix}\right) = \pi^2 z^{\frac{1}{4}(2a+2b-3)} \csc((a-b)\pi)\left(\boldsymbol{H}_{a-b-\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right) - Y_{a-b-\frac{1}{2}}\left(\frac{2}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0523.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, b \\ b \end{matrix}\right) = i\sqrt{\pi}\, z^{a-\frac{1}{2}}\, \Gamma(2b-2a)\left(\exp\left(i(a-b)\pi - 2\sqrt{-\frac{1}{z}}\right)\Gamma\left(2a-2b+1,\, -2\sqrt{-\frac{1}{z}}\right) - \exp\left(-i(a-b)\pi + 2\sqrt{-\frac{1}{z}}\right)\Gamma\left(2a-2b+1,\, 2\sqrt{-\frac{1}{z}}\right)\right) /;\, 0 \le \arg(z) \le \frac{\pi}{2}$$

07.34.03.0524.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, a,\, a+\frac{1}{2} \\ a \end{matrix}\right) = \sqrt{\pi}\, z^{a-\frac{1}{2}}\left(2\sin\left(\frac{2}{\sqrt{z}}\right)\mathrm{Ci}\left(\frac{2}{\sqrt{z}}\right) + \cos\left(\frac{2}{\sqrt{z}}\right)\left(\pi - 2\,\mathrm{Si}\left(\frac{2}{\sqrt{z}}\right)\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0525.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{4},\, a+\frac{1}{2} \\ a+\frac{1}{4} \end{matrix}\right) = 2\sqrt{2}\,\pi^{3/2} z^{a-\frac{1}{2}}\left(\cos\left(\frac{2}{\sqrt{z}}\right)\left(\frac{1}{2} - C\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right) + \sin\left(\frac{2}{\sqrt{z}}\right)\left(\frac{1}{2} - S\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0526.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{4},\, a+\frac{3}{4} \\ a \end{matrix}\right) = 2\sqrt{2}\,\pi^{3/2} z^{a-\frac{1}{4}}\left(\cos\left(\frac{2}{\sqrt{z}}\right)\left(\frac{1}{2} - S\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right) - \sin\left(\frac{2}{\sqrt{z}}\right)\left(\frac{1}{2} - C\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right)\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0527.01

$$G_{3,1}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, a+\frac{1}{2} \\ a+\frac{1}{2} \end{matrix}\right) = \sqrt{\pi}\, z^{a-\frac{1}{2}}\left(\sin\left(\frac{2}{\sqrt{z}}\right)\left(\pi - 2\,\mathrm{Si}\left(\frac{2}{\sqrt{z}}\right)\right) - 2\cos\left(\frac{2}{\sqrt{z}}\right)\mathrm{Ci}\left(\frac{2}{\sqrt{z}}\right)\right) /;\, z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{1, 3, 3, 2\}$

07.34.03.0528.01

$$G_{3,2}^{1,3}\left(z \middle| \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2 \end{matrix}\right) = \pi^2 \left(\frac{\csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3))\Gamma(1-a_1+b_1)}{\Gamma(a_1-b_2)} z^{a_1-1} {}_2\tilde{F}_2\left(1-a_1+b_1, 1-a_1+b_2; 1-a_1+a_2, 1-a_1+a_3; \frac{1}{z}\right) + \frac{\csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3))\Gamma(-a_2+b_1+1)}{\Gamma(a_2-b_2)} z^{a_2-1} {}_2\tilde{F}_2\left(1-a_2+b_1, 1-a_2+b_2; a_1-a_2+1, 1-a_2+a_3; \frac{1}{z}\right) + \frac{\csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2))\Gamma(1-a_3+b_1)}{\Gamma(a_3-b_2)} z^{a_3-1} {}_2\tilde{F}_2\left(1-a_3+b_1, 1-a_3+b_2; a_1-a_3+1, a_2-a_3+1; \frac{1}{z}\right)\right) /; a_2-a_1 \notin \mathbb{Z} \bigwedge a_3-a_1 \notin \mathbb{Z} \bigwedge a_3-a_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{1, 3, 3, 3\}$

07.34.03.0529.01

$$G_{3,3}^{1,3}\left(z \middle| \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{matrix}\right) = \Gamma(1-a_1+b_1)\Gamma(1-a_2+b_1)\Gamma(1-a_3+b_1) z^{b_1} {}_3\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1, 1-a_3+b_1; b_1-b_2+1, b_1-b_3+1; -z)$$

07.34.03.0530.01

$$G_{3,3}^{1,3}\left(z \middle| \begin{matrix} a, c, d \\ b, a+1, e \end{matrix}\right) = \frac{(b-a)\Gamma(b-c+1)\Gamma(b-d+1)}{\Gamma(b-e+1)} z^b \left({}_2F_1(b-d+1, b-c+1; b-e+1; -z) - \frac{(b-c+1)(b-d+1)}{(b-a)(b-e+1)} z\, {}_2F_1(b-d+2, b-c+2; b-e+2; -z)\right)$$

07.34.03.0531.01

$$G_{3,3}^{1,3}\left(z \middle| \begin{matrix} a, c, d \\ b, a+n, e \end{matrix}\right) = \frac{(-1)^n \Gamma(b-c+1)\Gamma(b-d+1)}{\Gamma(b-e+1)} z^b \sum_{k=0}^{n} \binom{n}{k} \frac{(a-b)_{n-k}(b-c+1)_k(b-d+1)_k}{(b-e+1)_k} {}_2F_1(b-d+k+1, b-c+k+1; b-e+k+1; -z) z^k /; n \in \mathbb{N}^+$$

07.34.03.0532.01

$$G_{3,3}^{1,3}\left(z \middle| \begin{matrix} a, c, d \\ b, a-1, d-1 \end{matrix}\right) = \frac{z^b \Gamma(b-c+1)}{(b-a+1)(a-d)(b-d+1)} ((b-d+1)\, {}_2F_1(b-a+1, b-c+1; b-a+2; -z) - (b-a+1)\, {}_2F_1(b-d+1, b-c+1; b-d+2; -z))$$

07.34.03.0533.01

$$G_{3,3}^{1,3}\left(z \middle| \begin{matrix} a, c, d \\ a, b, a-1 \end{matrix}\right) = \frac{\Gamma(a-c)\Gamma(a-d)}{\Gamma(a-b)} z^{a-1} (1 - {}_2F_1(a-c, a-d; a-b; -z))$$

07.34.03.0534.01

$$G_{3,3}^{1,3}\left(z \middle| \begin{matrix} a, c, c+\frac{1}{2} \\ b, d, a-b+2c-d-1 \end{matrix}\right) = \frac{2\sqrt{\pi}\,\Gamma(b-a+1)\Gamma(2b-2c+1)}{\Gamma(b-d+1)\Gamma(2b-a-2c+d+2)} z^{2c-b-1} \left(\sqrt{z+1}-1\right)^{2b-2c+1} {}_3F_2\left(2b-2c+1, a-d, b-2c+d+1; b-d+1, 2b-a-2c+d+2; \frac{z-2\sqrt{z+1}+2}{z}\right)$$

07.34.03.0535.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c-1 \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+2)}{\Gamma\left(b-a+\frac{3}{2}\right)^2}\, z^b\, {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{3}{2};\, -z\right) {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+3}{2}-a;\, b-a+\frac{3}{2};\, -z\right)$$

07.34.03.0536.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c-1 \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+2)}{\Gamma\left(b-a+\frac{3}{2}\right)^2}\, z^b\, {}_2F_1\left(\frac{b-c}{2}+1, \frac{b+c}{2}-a+1;\, b-a+\frac{3}{2};\, -z\right) {}_2F_1\left(\frac{b-c}{2}, \frac{b+c}{2}-a+1;\, b-a+\frac{3}{2};\, -z\right)$$

07.34.03.0537.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c-1 \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{\sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+2)}{\sqrt{z+1}}\, z^{a-\frac{1}{2}}\, \mathfrak{P}_{a-c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{P}_{c-a+\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0538.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c-1 \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{\sqrt{2}\;(b+c-2a+1)\, e^{i(a-c)\pi}\, \Gamma(b-c+1)}{\sqrt{z+1}}\, z^{a-\frac{3}{4}}\, \mathfrak{P}_{c-a+\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0539.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c-1 \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = -\frac{2\, e^{2i(a-c)\pi}\, \Gamma(b-c+1)}{\sqrt{\pi}\;\Gamma(b+c-2a+1)\sqrt{z+1}}\, z^{a-1}\, \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{b-a}^{c-a+1}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0540.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+1)}{\Gamma\left(b-a+\frac{3}{2}\right)^2}\, z^b \sqrt{z+1}\; {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{3}{2};\, -z\right) {}_2F_1\left(\frac{b-c}{2}+1, \frac{b+c}{2}-a+1;\, b-a+\frac{3}{2};\, -z\right)$$

07.34.03.0541.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+1)}{\Gamma\left(b-a+\frac{3}{2}\right)^2}\, z^b\, {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{3}{2};\, -z\right)^2$$

07.34.03.0542.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+1)}{\Gamma\left(b-a+\frac{3}{2}\right)^2}\, z^b\, {}_2F_1\left(b-c+1,\, b+c-2a+1;\, b-a+\frac{3}{2};\, \frac{1-\sqrt{z+1}}{2}\right)^2$$

07.34.03.0543.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{array}\right) = \sqrt{\pi}\;\Gamma(b-c+1)\,\Gamma(b+c-2a+1)\, z^{a-\frac{1}{2}}\, \mathfrak{P}_{-a+c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right)^2 /;\, z \notin (-1,\, 0)$$

07.34.03.0544.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{matrix}\right) = \frac{2\, e^{2i(a-c)\pi}\, \Gamma(b-c+1)}{\sqrt{\pi}\, \Gamma(b+c-2a+1)}\, z^{a-1}\, \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right)^2 \,/;\, z \notin (-1,0)$$

07.34.03.0545.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b-1 \end{matrix}\right) = \sqrt{2}\, e^{i(c-a)\pi}\, z^{a-\frac{3}{4}}\, \Gamma(b+c-2a+1)\, \mathfrak{P}_{c-a-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{b-a}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.0546.01

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

$$z^b\, {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{1}{2};\, -z\right) {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{3}{2};\, -z\right)$$

07.34.03.0547.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b \end{matrix}\right) = \frac{\sqrt{\pi}\, z^a\, \Gamma(b-c+1)\, \Gamma(b+c-2a+1)}{\sqrt{z+1}}\, \mathfrak{P}_{c-a-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{P}_{c-a-\frac{1}{2}}^{a-b+\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,0)$$

07.34.03.0548.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b \end{matrix}\right) = \frac{\sqrt{2}\, (b-c)\, e^{i(c-a)\pi}\, \Gamma(b+c-2a+1)}{\sqrt{z+1}}\, z^{a-\frac{1}{4}}\, \mathfrak{P}_{a-c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{b-a-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.0549.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b \end{matrix}\right) = \frac{\sqrt{2}\, e^{i(a-c)\pi}\, \Gamma(b-c+1)}{\sqrt{z+1}}\, z^{a-\frac{1}{4}}\, \mathfrak{P}_{c-a-\frac{1}{2}}^{a-b+\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.0550.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b \end{matrix}\right) = \frac{\sqrt{2}\, e^{i(c-a)\pi}\, \Gamma(b+c-2a+1)}{\sqrt{z+1}}\, z^{a-\frac{1}{4}}\, \mathfrak{P}_{a-c-\frac{1}{2}}^{a-b+\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{b-a}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.0551.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b \end{matrix}\right) = \frac{2\, e^{2i(c-a)\pi}\, \Gamma(b+c-2a+1)}{\sqrt{\pi}\, \Gamma(b-c)\, \sqrt{z+1}}\, z^{a-\frac{1}{2}}\, \mathfrak{Q}_{b-a-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{b-a}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.0552.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a-\frac{1}{2},\, 2a-b \end{matrix}\right) = \frac{2\, e^{2i(a-c)\pi}\, \Gamma(b-c+1)}{\sqrt{\pi}\, \Gamma(b+c-2a)\, \sqrt{z+1}}\, z^{a-\frac{1}{2}}\, \mathfrak{Q}_{b-a-1}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.0553.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a,\, c,\, 2a-c \\ b,\, a+\frac{1}{2},\, 2a-b-1 \end{matrix}\right) = \frac{4^{a-b}\sqrt{\pi}\, \Gamma(b-c+1)\, \Gamma(b+c-2a+1)}{(2b-2a+1)\, \Gamma\left(b-a+\frac{1}{2}\right)^2}\, z^b$$

$$\left(2\, {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{1}{2};\, -z\right) - {}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{3}{2};\, -z\right)\right)$$

$${}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a;\, b-a+\frac{3}{2};\, -z\right)$$

07.34.03.0554.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, 2a-c+1 \\ b, a-\frac{1}{2}, 2a-b-1 \end{array} \right.\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\,\Gamma(b-c+1)\,\Gamma(b+c-2a)}{(2a-2c+1)\,\Gamma\left(b-a+\frac{3}{2}\right)^2} z^b$$
$$\left((b-c+1)\,{}_2F_1\left(\frac{b-c}{2}+1, \frac{b+c}{2}-a; b-a+\frac{3}{2}; -z\right)^2 - (b+c-2a)\,{}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a; b-a+\frac{3}{2}; -z\right)^2\right)$$

07.34.03.0555.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, 2a-c+1 \\ b, a-\frac{1}{2}, 2a-b \end{array} \right.\right) = \frac{2^{2a-2b+1}\sqrt{\pi}\,\Gamma(b-c+1)\,\Gamma(b+c-2a)}{(2b-2a+1)(2a-2c+1)\,\Gamma\left(b-a+\frac{1}{2}\right)^2} z^b$$
$$\left((b-c+1)\,{}_2F_1\left(\frac{b-c}{2}+1, \frac{b+c}{2}-a; b-a+\frac{1}{2}; -z\right){}_2F_1\left(\frac{b-c}{2}+1, \frac{b+c}{2}-a; b-a+\frac{3}{2}; -z\right) - \right.$$
$$\left.(b+c-2a)\,{}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a; b-a+\frac{1}{2}; -z\right){}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c+1}{2}-a; b-a+\frac{3}{2}; -z\right)\right)$$

07.34.03.0556.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, 2a-c+2 \\ b, a+\frac{1}{2}, 2a-b+1 \end{array} \right.\right) = \frac{2^{2a-2b+1}\sqrt{\pi}\, z^b\,\Gamma(b-c+1)\,\Gamma(b+c-2a-1)}{\Gamma\left(b-a+\frac{1}{2}\right)^2}\,{}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c-1}{2}-a; b-a+\frac{1}{2}; -z\right)$$
$$\left((a-b+1)\,{}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c-1}{2}-a; b-a+\frac{1}{2}; -z\right) + (2b-2a-1)\,{}_2F_1\left(\frac{b-c+1}{2}, \frac{b+c-1}{2}-a; b-a-\frac{1}{2}; -z\right)\right)$$

07.34.03.0557.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, a+\frac{1}{2} \\ b, 2a-b, c-1 \end{array} \right.\right) = \frac{2^{2a-b-c+1}\sqrt{\pi}}{b-c+1} z^b \left(\sqrt{z+1}+1\right)^{c-b-1}\,{}_2F_1\left(b-c+1, b+c-2a; b-c+2; \frac{1}{2}\left(1-\sqrt{z+1}\right)\right)$$

07.34.03.0558.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, a+\frac{1}{2} \\ b, 2a-b, c-1 \end{array} \right.\right) = \frac{4^{a-c+1}\sqrt{\pi}}{b-c+1} z^{2c-b-2} \left(\sqrt{z+1}-1\right)^{2(b-c+1)}\,{}_2F_1\left(b-c+1, 2a-2c+2; b-c+2; \frac{z-2\sqrt{z+1}+2}{z}\right)$$

07.34.03.0559.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, a+b-c+\frac{1}{2} \\ b, -b+2c-1, 2a+b-2c \end{array} \right.\right) =$$
$$\frac{2\pi\,\Gamma(b-a+1)}{\Gamma\left(b-c+\frac{3}{2}\right)\Gamma(c-a+1)} z^b (z+4)^{a-b-1}\,{}_3F_2\left(\frac{1+b-a}{3}, \frac{2+b-a}{3}, \frac{b-a}{3}+1; b-c+\frac{3}{2}, c-a+1; \frac{27z^2}{(z+4)^3}\right)$$

07.34.03.0560.01

$$G_{3,3}^{1,3}\left(z \left| \begin{array}{c} a, c, 2a-b-2 \\ b, a-2, 2a-c-2 \end{array} \right.\right) = \frac{2\,\Gamma(2b-2a+2)\,\Gamma(b-c+1)}{(b-a+2)\,\Gamma(b+c-2a+3)} z^b$$
$$(z+1)^{2a-2b-3}\,{}_3F_2\left(b-a+\frac{3}{2}, b-a+2, c-a+2; b-a+3, b+c-2a+3; \frac{4z}{(z+1)^2}\right) /; |z| < 1$$

07.34.03.0561.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,c,\,2a-b-2\\ b,\,2a-b-1,\,\frac{c-b-3}{2}+a\end{matrix}\right)=2\,z^b\,(z+1)^{\frac{1}{2}(c-b-1)}\,\Gamma(b-a+2)\,\Gamma(b-c+1)\,{}_2\tilde{F}_1\left(\frac{b-c+1}{2},\,\frac{b+c+1}{2}-a;\,\frac{3b-c+5}{2}-a;\,-z\right)$$

07.34.03.0562.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,c,\,2a-b+1\\ b,\,a+1,\,2a-c+1\end{matrix}\right)=\frac{\Gamma(2b-2a+1)\,\Gamma(b-c+1)}{2\,\Gamma(b+c-2a)}\,z^b\,(z+1)\,{}_2F_1(2b-2a+1,\,b-c+2;\,b+c-2a;\,-z)$$

07.34.03.0563.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,c,\,2a-b+1\\ b,\,a+1,\,2a-c+1\end{matrix}\right)=\frac{\Gamma(2b-2a+1)\,\Gamma(b-c+1)}{2\,\Gamma(b+c-2a+1)}\,z^b\,(z+1)^{2c-2b-3}\,((b+c-2a)\,{}_2F_1(c-b-2,\,2c-2a-3;\,b+c-2a;\,-z)+2\,(b-c+2)\,z\,{}_2F_1(c-b-1,\,2c-2a-2;\,b+c-2a+1;\,-z))$$

07.34.03.0564.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,b+\frac{1}{2},\,2b-a+1\\ b,\,c,\,2b-c\end{matrix}\right)=\frac{\sqrt{\pi}\,\csc((a-b)\,\pi)\,\sin((b-c)\,\pi)}{b-c}\,z^b\,{}_2F_1\left(b+\frac{1-a-c}{2},\,\frac{a-c}{2};\,b-c+1;\,-z\right)\,{}_2F_1\left(\frac{a+c}{2}-b,\,\frac{1+c-a}{2};\,c-b+1;\,-z\right)$$

07.34.03.0565.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,b+\frac{1}{2},\,2b-a+1\\ b,\,c,\,2b-c\end{matrix}\right)=\frac{\sqrt{\pi}\,\csc((a-b)\,\pi)\,\sin((b-c)\,\pi)}{b-c}\,z^b\,{}_2F_1\left(a-b,\,b-a+1;\,b-c+1;\,\frac{1}{2}\left(1-\sqrt{z+1}\right)\right)\,{}_2F_1\left(a-b,\,b-a+1;\,c-b+1;\,\frac{1}{2}\left(1-\sqrt{z+1}\right)\right)$$

07.34.03.0566.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,b+\frac{1}{2},\,2b-a+1\\ b,\,c,\,2b-c\end{matrix}\right)=\pi^{3/2}\,z^b\,\csc((a-b)\,\pi)\,\mathfrak{P}_{a-b-1}^{b-c}\left(\sqrt{z+1}\right)\,\mathfrak{P}_{a-b-1}^{c-b}\left(\sqrt{z+1}\right)$$

07.34.03.0567.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,b+\frac{1}{2},\,2b-a+1\\ b,\,c,\,2b-c\end{matrix}\right)=\frac{\sqrt{2}\,e^{i\left(b-a+\frac{1}{2}\right)\pi}\,\pi\,\csc((a-b)\,\pi)}{\Gamma(a-2b+c)}\,z^{b-\frac{1}{4}}\,\mathfrak{P}_{a-b-1}^{c-b}\left(\sqrt{z+1}\right)\,\mathfrak{Q}_{c-b-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{1+\frac{1}{z}}\right)\,/;\,z\notin(-1,\,0)$$

07.34.03.0568.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,b+\frac{1}{2},\,2b-a+1\\ b,\,c,\,2b-c\end{matrix}\right)=\frac{2\,e^{i(2a-2b-1)\pi}\,\sqrt{\pi}\,\csc((a-b)\,\pi)}{\Gamma(2b-a-c+1)\,\Gamma(c-a+1)}\,z^{b-\frac{1}{2}}\,\mathfrak{Q}_{b-c-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\sqrt{1+\frac{1}{z}}\right)\,\mathfrak{Q}_{c-b-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\sqrt{1+\frac{1}{z}}\right)\,/;\,z\notin(-1,\,0)$$

07.34.03.0569.01

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

07.34.03.0570.01

$$G_{3,3}^{1,3}\left(z\,\middle|\,\begin{matrix}a,\,a,\,a\\ a-\frac{1}{2},\,a-\frac{1}{2},\,a-\frac{1}{2}\end{matrix}\right)=\frac{4}{\sqrt{\pi}}\,z^{a-\frac{1}{2}}\,K\left(\frac{1}{2}\left(1-\sqrt{z+1}\right)\right)^2$$

07.34.03.0571.01

$$G_{3,3}^{1,3}\left(z \,\middle|\, \begin{matrix} a, a, a \\ a-\frac{1}{2}, a-\frac{1}{2}, a-\frac{1}{2} \end{matrix}\right) = \frac{8}{\sqrt{\pi}\left(\sqrt{z+1}+1\right)} z^{a-\frac{1}{2}} K\left(\frac{\left(\sqrt{z+1}-1\right)^2}{z}\right)^2$$

07.34.03.0572.01

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

07.34.03.0573.01

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

07.34.03.0574.01

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

07.34.03.0575.01

$$G_{3,3}^{1,3}\left(-1 \,\middle|\, \begin{matrix} 0, 0, a \\ 0, -1, -1 \end{matrix}\right) = -\Gamma(-a) (\psi(a+1)+\gamma)$$

07.34.03.0576.01

$$G_{3,3}^{1,3}\left(-1 \,\middle|\, \begin{matrix} 0, 0, a \\ 0, -1, -1 \end{matrix}\right) = -\Gamma(-a) H_a$$

07.34.03.0577.01

$$G_{3,3}^{1,3}\left(-1 \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ 0, b_1, b_2 \end{matrix}\right) = (-1)^{b_2-b_1} \Gamma(1-a_1)\Gamma(1-a_2)\Gamma(1-a_3)\sqrt{\Gamma(a_1)}\sqrt{\Gamma(a_2)}\sqrt{\Gamma(a_3)} \sqrt{\Gamma(a_1+a_2+a_3-b_1-b_2-1)} \left(\begin{matrix} \frac{1}{2}(a_1+a_2-b_1-2) & \frac{1}{2}(a_1+a_3-b_2-2) & \frac{1}{2}(a_2+a_3-b_1-b_2-2) \\ \frac{1}{2}(a_1-a_2-b_1) & \frac{1}{2}(-a_1+a_3+b_2) & \frac{1}{2}(a_2-a_3+b_1-b_2) \end{matrix}\right) \Big/ \left(\sqrt{\Gamma(a_1-b_1)}\sqrt{\Gamma(a_2-b_1)}\sqrt{\Gamma(a_3-b_1)}\sqrt{\Gamma(a_1-b_2)}\sqrt{\Gamma(a_2-b_2)}\sqrt{\Gamma(a_3-b_2)}\right) /; \operatorname{Re}(a_1+a_2+a_3-b_1-b_2) > 1$$

07.34.03.0578.01

$$G_{3,3}^{1,3}\left(-1 \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ 0, b_1, b_2 \end{matrix}\right) = (-1)^{b_2-b_1} \Gamma(1-a_1)\Gamma(1-a_2)\Gamma(1-a_3)\sqrt{\Gamma(a_1)}\sqrt{\Gamma(a_2)}\sqrt{\Gamma(a_3)} \sqrt{\Gamma(a_1+a_2+a_3-b_1-b_2-1)} \left(\begin{matrix} \frac{1}{2}(a_1+a_2-b_1-2) & \frac{1}{2}(a_1+a_3-b_2-2) & \frac{1}{2}(a_2+a_3-b_1-b_2-2) \\ \frac{1}{2}(a_1-a_2-b_1) & \frac{1}{2}(-a_1+a_3+b_2) & \frac{1}{2}(a_2-a_3+b_1-b_2) \end{matrix}\right) \Big/ \left(\sqrt{\Gamma(a_1-b_1)}\sqrt{\Gamma(a_2-b_1)}\sqrt{\Gamma(a_3-b_1)}\sqrt{\Gamma(a_1-b_2)}\sqrt{\Gamma(a_2-b_2)}\sqrt{\Gamma(a_3-b_2)}\right) /; \operatorname{Re}(a_1+a_2+a_3-b_1-b_2) > 1$$

Case $\{m, n, p, q\} = \{1, 3, 4, 2\}$

07.34.03.0579.01

$$G_{4,2}^{1,3}\left(z \left| \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2 \end{matrix} \right.\right) = \frac{\pi^2 z^{a_1-1} \csc(\pi (a_1 - a_2)) \csc(\pi (a_1 - a_3)) \Gamma(b_1 - a_1 + 1)}{\Gamma(a_1 - b_2)} \, {}_2\tilde{F}_3\left(b_1 - a_1 + 1, b_2 - a_1 + 1; a_2 - a_1 + 1, a_3 - a_1 + 1, a_4 - a_1 + 1; \frac{1}{z}\right) + \frac{\pi^2 z^{a_2-1} \csc(\pi (a_2 - a_1)) \csc(\pi (a_2 - a_3)) \Gamma(b_1 - a_2 + 1)}{\Gamma(a_2 - b_2)} \, {}_2\tilde{F}_3\left(b_1 - a_2 + 1, b_2 - a_2 + 1; a_1 - a_2 + 1, a_3 - a_2 + 1, a_4 - a_2 + 1; \frac{1}{z}\right) + \frac{\pi^2 z^{a_3-1} \csc(\pi (a_3 - a_1)) \csc(\pi (a_3 - a_2)) \Gamma(b_1 - a_3 + 1)}{\Gamma(a_3 - b_2)} \, {}_2\tilde{F}_3\left(b_1 - a_3 + 1, b_2 - a_3 + 1; a_1 - a_3 + 1, a_2 - a_3 + 1, a_4 - a_3 + 1; \frac{1}{z}\right) /; a_1 - a_2 \notin \mathbb{Z} \land a_1 - a_3 \notin \mathbb{Z} \land a_3 - a_2 \notin \mathbb{Z}$$

07.34.03.0580.01

$$G_{4,2}^{1,3}\left(z \left| \begin{matrix} a, c, c + \frac{1}{2}, 2c - a + 1 \\ b, 2c - b \end{matrix} \right.\right) = \frac{2^{2c-2a+2} \sqrt{\pi} \, \Gamma(b - a + 1) z^{a-1}}{\Gamma(2c - 2a + 2)} \, {}_1F_1\left(b - a + 1; 2c - 2a + 2; -\frac{2}{\sqrt{z}}\right) U\left(b - a + 1, 2c - 2a + 2, \frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0581.01

$$G_{4,2}^{1,3}\left(z \left| \begin{matrix} a, c, c + \frac{1}{2}, 2c - a + 1 \\ b, 2c - b \end{matrix} \right.\right) = \frac{4^{c-a+1} \sqrt{\pi} \, \Gamma(b - a + 1)}{\Gamma(2c - 2a + 2)} z^{a-1} e^{-\frac{2}{\sqrt{z}}} \, {}_1F_1\left(2c - a - b + 1; 2c - 2a + 2; \frac{2}{\sqrt{z}}\right) U\left(b - a + 1, 2c - 2a + 2, \frac{2}{\sqrt{z}}\right)$$

07.34.03.0582.01

$$G_{4,2}^{1,3}\left(z \left| \begin{matrix} a, c, 2b - c, 2b - a \\ b, b - \frac{1}{2} \end{matrix} \right.\right) = \sqrt{\pi} \, \csc((b - c)\pi) z^{b-1} \left(I_{c-a}\left(\frac{1}{\sqrt{z}}\right) K_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) - I_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) K_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0583.01

$$G_{4,2}^{1,3}\left(z \left| \begin{matrix} a, c, 2b - c + 1, 2b - a + 1 \\ b, b + \frac{1}{2} \end{matrix} \right.\right) = \sqrt{\pi} \, \csc((c - b)\pi) z^{b-\frac{1}{2}} \left(I_{c-a}\left(\frac{1}{\sqrt{z}}\right) K_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) + I_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) K_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0584.01

$$G_{4,2}^{1,3}\left(z \left| \begin{matrix} a, a + \frac{1}{4}, a + \frac{1}{2}, a + \frac{3}{4} \\ a + \frac{1}{4}, a - \frac{1}{4} \end{matrix} \right.\right) = \sqrt{2} \, \pi z^{a-\frac{1}{4}} \operatorname{erfc}\left(\frac{\sqrt{2}}{\sqrt[4]{z}}\right) \operatorname{erfi}\left(\frac{\sqrt{2}}{\sqrt[4]{z}}\right)$$

Case $\{m, n, p, q\} = \{1, 4, 4, 2\}$

07.34.03.0585.01

$$G_{4,2}^{1,4}\left(z \left| \begin{matrix} a, c, c + \frac{1}{2}, 2c - a + 1 \\ b, 2c - b \end{matrix} \right.\right) = 2^{2a-2c} \sqrt{\pi} \, \Gamma(b - a + 1) \Gamma(a + b - 2c) z^{2c-a} U\left(a + b - 2c, 2a - 2c, -\frac{2i}{\sqrt{z}}\right) U\left(a + b - 2c, 2a - 2c, \frac{2i}{\sqrt{z}}\right)$$

07.34.03.0586.01

$$G_{4,2}^{1,4}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, b, 2a-b+1 \\ b, 2a-b \end{matrix}\right) = 4^{b-a} \sqrt{\pi}\, z^{2a-b}\, \Gamma(2b-2a)\, \Gamma\left(2a-2b+1, -2\sqrt{-\frac{1}{z}}\right) \Gamma\left(2a-2b+1, 2\sqrt{-\frac{1}{z}}\right)$$

07.34.03.0587.01

$$G_{4,2}^{1,4}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, b, 2a-b+1 \\ b, 2a-b \end{matrix}\right) = 4^{a-b+1} \sqrt{\pi}\, \Gamma(2b-2a)\, z^{b-1} E_{2b-2a}\left(-2\sqrt{-\frac{1}{z}}\right) E_{2b-2a}\left(2\sqrt{-\frac{1}{z}}\right)$$

07.34.03.0588.01

$$G_{4,2}^{1,4}\left(z \middle| \begin{matrix} a, a+\frac{1}{4}, a+\frac{1}{2}, a+\frac{3}{4} \\ a+\frac{1}{4}, a-\frac{1}{4} \end{matrix}\right) = 2\sqrt{2}\, \pi^2 z^{a-\frac{1}{4}} \left(\left(\frac{1}{2} - C\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right)^2 + \left(\frac{1}{2} - S\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)\right)^2\right) /;\ z \notin (-\infty, 0)$$

07.34.03.0589.01

$$G_{4,2}^{1,4}\left(z \middle| \begin{matrix} a, a+\frac{1}{4}, a+\frac{1}{2}, a+\frac{3}{4} \\ a+\frac{1}{4}, a-\frac{1}{4} \end{matrix}\right) = \sqrt{2}\, \pi^2 z^{a-\frac{1}{4}}\, \text{erfc}\left(\frac{\sqrt{2}}{\sqrt[4]{-z}}\right) \left(1 - \frac{\sqrt[4]{-z}}{\sqrt{-\sqrt{-z}}}\, \text{erfi}\left(\frac{\sqrt{2}}{\sqrt[4]{-z}}\right)\right) /;\ z \notin (-\infty, 0)$$

07.34.03.0590.01

$$G_{4,2}^{1,4}\left(z \middle| \begin{matrix} a, a+\frac{1}{2}, a+\frac{1}{2}, a+\frac{1}{2} \\ a+\frac{1}{2}, a-\frac{1}{2} \end{matrix}\right) = 2\sqrt{\pi}\, z^{a-\frac{1}{2}} \left(\text{Ci}\left(\frac{2}{\sqrt{z}}\right)^2 + \left(\text{Si}\left(\frac{2}{\sqrt{z}}\right) - \frac{\pi}{2}\right)^2\right) /;\ z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{1, 4, 4, 4\}$

07.34.03.0591.01

$$G_{4,4}^{1,4}\left(z \middle| \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) = \Gamma(b_1-a_1+1)\,\Gamma(b_1-a_2+1)\,\Gamma(b_1-a_3+1)\,\Gamma(b_1-a_4+1)$$
$$z^{b_1}\, {}_4\tilde{F}_3(b_1-a_1+1, b_1-a_2+1, b_1-a_3+1, b_1-a_4+1; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1; -z)$$

07.34.03.0592.01

$$G_{4,4}^{1,4}\left(z \middle| \begin{matrix} a, c, d, e \\ b, f, a-1, e-1 \end{matrix}\right) =$$
$$\frac{z^b\, \Gamma(b-c+1)\,\Gamma(b-d+1)}{(b-a+1)(b-e+1)(e-a)\,\Gamma(b-f+2)} ((b-e+1)(f-a)\, {}_3F_2(b-a+1, b-c+1, b-d+1; b-a+2, b-f+2; -z) +$$
$$(a-b-1)(f-e)\, {}_3F_2(b-c+1, b-d+1, b-e+1; b-e+2, b-f+2; -z))$$

07.34.03.0593.01

$$G_{4,4}^{1,4}\left(z \middle| \begin{matrix} a, c, d, e \\ b, a-1, e-1, c-1 \end{matrix}\right) = \Gamma(b-d+1)\, z^b$$
$$\left(\frac{{}_2F_1(b-a+1, b-d+1; b-a+2; -z)}{(-a+b+1)(a-c)(a-e)} + \frac{{}_2F_1(b-c+1, b-d+1; b-c+2; -z)}{(b-c+1)(c-a)(c-e)} + \frac{{}_2F_1(b-e+1, b-d+1; b-e+2; -z)}{(b-e+1)(e-a)(e-c)}\right)$$

07.34.03.0594.01

$$G_{4,4}^{1,4}\left(z \middle| \begin{matrix} a, c, d, a-c+d \\ b, \frac{a+d-1}{2}, \frac{a+d}{2}, a-b+d-1 \end{matrix}\right) = \frac{\Gamma(b-a+1)\,\Gamma(b-c+1)\,\Gamma(b-d+1)\,\Gamma(b-a+c-d+1)}{\Gamma(2b-a-d+2)\,\Gamma\left(b+\frac{3-a-d}{2}\right)\Gamma\left(b-\frac{a+d}{2}+1\right)}$$
$$z^b \left(2z - 2\sqrt{-z-1}\,\sqrt{-z}+1\right)^{b-a+1} {}_2F_1\left(b-a+1, b-c+1; 2b-a-d+2; 2\sqrt{-z-1}\,\sqrt{-z}-2z\right)$$
$${}_2F_1\left(b-a+1, b+c-a-d+1; 2b-a-d+2; 2\sqrt{-z-1}\,\sqrt{-z}-2z\right)$$

07.34.03.0595.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, c, d, a-c+d \\ b, \frac{a+d-1}{2}, \frac{a+d}{2}, a-b+d-1 \end{array} \right.\right) = \frac{2^{2b-a-d+1}\,\Gamma(b-a+1)\,\Gamma(b-c+1)\,\Gamma(b-d+1)\,\Gamma(b+c-a-d+1)}{\sqrt{\pi}\;\Gamma(2b-a-d+2)^2}$$
$$z^b\,{}_2F_1\left(b-a+1, b-c+1; 2b-a-d+2; -2\sqrt{z}\left(\sqrt{z+1}+\sqrt{z}\right)\right)$$
$${}_2F_1\left(b-a+1, b-c+1; 2b-a-d+2; 2\sqrt{z}\left(\sqrt{z+1}-\sqrt{z}\right)\right) /; z \notin (-\infty, -1)$$

07.34.03.0596.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, c, d, 2a-b+1 \\ b, a+1, 2a-c+1, 2a-d+1 \end{array} \right.\right) = \frac{\Gamma(2b-2a+1)\,\Gamma(b-c+1)\,\Gamma(b-d+1)}{2\,\Gamma(b-2a+c)\,\Gamma(b-2a+d)}\,z^b\,(1-z)$$
$$(z+1)^{2a-2b-1}\,{}_3F_2\left(b-a+\frac{1}{2}, b-a+1, c+d-2a-1; b+c-2a, b+d-2a; \frac{4z}{(z+1)^2}\right) /; |z| < 1$$

07.34.03.0597.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, c, a+\frac{1}{2}, c+\frac{1}{2} \\ b, d, b-\frac{1}{2}, d+\frac{1}{2} \end{array} \right.\right) =$$
$$\frac{4^{a-b+c-d}\,\Gamma(2b-2a)\,\Gamma(2b-2c)}{\sqrt{-z}\;\Gamma(2b-2d)}\,z^b\left({}_2F_1\left(2b-2a, 2b-2c; 2b-2d; \sqrt{-z}\right) - {}_2F_1\left(2b-2a, 2b-2c; 2b-2d; -\sqrt{-z}\right)\right)$$

07.34.03.0598.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, c, a+\frac{1}{2}, c+\frac{1}{2} \\ b, d, b+\frac{1}{2}, d+\frac{1}{2} \end{array} \right.\right) = \frac{2^{2a-2b+2c-2d-1}\,\Gamma(2b-2a+1)\,\Gamma(2b-2c+1)}{\Gamma(2b-2d+1)}\,z^b$$
$$\left({}_2F_1\left(2b-2a+1, 2b-2c+1; 2b-2d+1; -\sqrt{-z}\right) + {}_2F_1\left(2b-2a+1, 2b-2c+1; 2b-2d+1; \sqrt{-z}\right)\right)$$

07.34.03.0599.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, c, \frac{a+c-1}{2}, \frac{a+c}{2} \\ b, d, a-b+c-1, a+c-d-1 \end{array} \right.\right) = \frac{2^{a-2b+c-1}\sqrt{\pi}\;\Gamma(b-a+1)\,\Gamma(b-c+1)}{\Gamma(b-d+1)\,\Gamma(b-a-c+d+2)}\,z^b$$
$${}_2F_1\left(b-a+1, b-c+1; b-d+1; \frac{1}{2}\left(1-\sqrt{z+1}\right)\right)\,{}_2F_1\left(b-a+1, b-c+1; b-a-c+d+2; \frac{1}{2}\left(1-\sqrt{z+1}\right)\right)$$

07.34.03.0600.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, c, \frac{2a+b-2}{3}, a+b-c+\frac{1}{2} \\ b, \frac{2a+b+1}{3}, 2c-b-1, 2a+b-2c \end{array} \right.\right) =$$
$$\frac{2\pi\,\Gamma(b-a+2)}{3\,\Gamma\left(b-c+\frac{3}{2}\right)\Gamma(c-a+1)}\,(8-z)\,z^b\,(z+4)^{a-b-2}\,{}_3F_2\left(\frac{2+b-a}{3}, \frac{b-a}{3}+1, \frac{4+b-a}{3}; b-c+\frac{3}{2}, c-a+1; \frac{27z^2}{(z+4)^3}\right)$$

07.34.03.0601.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, a+\frac{1}{4}, a+\frac{1}{2}, a+\frac{3}{4} \\ b, c, 2a-b, 2a-c \end{array} \right.\right) = \frac{2^{4a-4b+\frac{1}{2}}\,\pi\;\Gamma\left(2b-2a+\frac{1}{2}\right)}{\Gamma(b-c+1)\,\Gamma(b+c-2a+1)}\,z^b$$
$${}_2F_1\left(b-a+\frac{1}{4}, b-a+\frac{3}{4}; b-c+1; \frac{1}{2}\left(1-\sqrt{z+1}\right)\right)\,{}_2F_1\left(b-a+\frac{1}{4}, b-a+\frac{3}{4}; b+c-2a+1; \frac{1}{2}\left(1-\sqrt{z+1}\right)\right)$$

07.34.03.0602.01

$$G_{4,4}^{1,4}\left(z \left| \begin{array}{c} a, a+\frac{1}{2}, 2b-a+\frac{1}{2}, 2b-a+1 \\ b, b, b, b+\frac{1}{2} \end{array} \right.\right) = 2\pi^{3/2} z^b \csc(2(a-b)\pi) P_{2a-2b-1}\left(\sqrt{z+1}-\sqrt{z}\right) P_{2a-2b-1}\left(\sqrt{z+1}+\sqrt{z}\right)$$

07.34.03.0603.01

$$G_{4,4}^{1,4}\left(-1 \left| \begin{array}{c} a_1, a_2, a_3, a_4 \\ 0, b_1, b_2, b_3 \end{array} \right.\right) = \frac{(-1)^{b_1-2}\,\Gamma(1-a_1)\,\Gamma(1-a_2)\,\Gamma(1-a_3)\,\Gamma(1-a_4)}{\Gamma(1-b_1)\,\Gamma(b_1)} \sqrt{\Gamma(a_1)}\,\sqrt{\Gamma(a_2)} \sqrt{\Gamma(a_3)}\,\sqrt{\Gamma(a_4)}\,\sqrt{\Gamma(-a_1+b_1+1)}\,\sqrt{\Gamma(-a_2+b_1+1)}\,\sqrt{\Gamma(-a_3+b_1+1)}\,\sqrt{\Gamma(-a_4+b_1+1)} \left\{ \begin{array}{ccc} \frac{1}{2}(a_1+a_4-b_3-2) & \frac{1}{2}(a_1+a_3-b_2-2) & \frac{1}{2}(-a_1-a_2+b_1) \\ \frac{1}{2}(a_2+a_3-b_3-2) & \frac{1}{2}(a_2+a_4-b_2-2) & \frac{1}{2}(-a_3-a_4+b_1) \end{array} \right\} \Big/ \left(\sqrt{\Gamma(a_1-b_2)}\,\sqrt{\Gamma(a_2-b_2)}\,\sqrt{\Gamma(a_3-b_2)} \sqrt{\Gamma(a_4-b_2)}\,\sqrt{\Gamma(a_1-b_3)}\,\sqrt{\Gamma(a_2-b_3)}\,\sqrt{\Gamma(a_3-b_3)}\,\sqrt{\Gamma(a_4-b_3)}\right) /;\; a_1+a_2+a_3+a_4-b_1-b_2-b_3 = 2$$

Cases with $m = 2$

Case $\{m, n, p, q\} = \{2, 0, 0, 2\}$

07.34.03.0604.01

$$G_{0,2}^{2,0}(z \mid b_1, b_2) = \pi \csc(\pi(b_2-b_1)) \left(z^{b_1}\, {}_0\tilde{F}_1(;\, b_1-b_2+1;\, z) - z^{b_2}\, {}_0\tilde{F}_1(;\, 1-b_1+b_2;\, z)\right) /;\; b_2-b_1 \notin \mathbb{Z}$$

07.34.03.0605.01

$$G_{0,2}^{2,0}(z \mid b, c) = 2 z^{\frac{1}{2}(b+c)} K_{b-c}\left(2\sqrt{z}\right)$$

07.34.03.1091.01

$$G_{0,2}^{2,0}(z \mid b, c) = \pi \csc(\pi(b-c))\, z^{\frac{b+c}{2}} \left(I_{c-b}\left(2\sqrt{z}\right) - I_{b-c}\left(2\sqrt{z}\right)\right)$$

07.34.03.0606.01

$$G_{0,2}^{2,0}\left(z \left| b, b+\frac{1}{2}\right.\right) = \sqrt{\pi}\, z^b\, e^{-2\sqrt{z}}$$

Case $\{m, n, p, q\} = \{2, 0, 0, 3\}$

07.34.03.0607.01

$$G_{0,3}^{2,0}(z \mid b_1, b_2, b_3) = \pi \csc(\pi(b_2-b_1)) \left(\frac{z^{b_1}}{\Gamma(b_1-b_2+1)\,\Gamma(b_1-b_3+1)}\, {}_0F_2(;\, b_1-b_2+1, b_1-b_3+1;\, z) - \frac{z^{b_2}}{\Gamma(1-b_1+b_2)\,\Gamma(b_2-b_3+1)}\, {}_0F_2(;\, 1-b_1+b_2, b_2-b_3+1;\, z)\right) /;\; b_2-b_1 \notin \mathbb{Z}$$

07.34.03.0608.01

$$G_{0,3}^{2,0}\left(z \left| b, b+\frac{1}{3}, b-\frac{1}{3}\right.\right) = \frac{2 z^{b-\frac{1}{3}}}{\sqrt{3}} \exp\left(-\frac{3\sqrt[3]{z}}{2}\right) \sin\left(\frac{1}{2}\, 3^{3/2}\, \sqrt[3]{z}\right)$$

Case $\{m, n, p, q\} = \{2, 0, 0, 4\}$

07.34.03.0609.01

$$G_{0,4}^{2,0}(z \mid b_1, b_2, b_3, b_4) = \pi \csc(\pi (b_2 - b_1)) \left(z^{b_1} {}_0\tilde{F}_3(; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; z) - z^{b_2} {}_0\tilde{F}_3(; b_2 - b_1 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1; z)\right) /; b_2 - b_1 \notin \mathbb{Z}$$

07.34.03.0610.01

$$G_{0,4}^{2,0}\left(z \,\middle|\, b, b, b + \tfrac{1}{2}, b + \tfrac{1}{2}\right) = z^b \left(\frac{2}{\pi} K_0\left(4 \sqrt[4]{z}\right) - Y_0\left(4 \sqrt[4]{z}\right)\right)$$

Case $\{m, n, p, q\} = \{2, 0, 1, 2\}$

07.34.03.0611.01

$$G_{1,2}^{2,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2 \end{matrix}\right) = \pi \csc(\pi (b_2 - b_1)) \left(\frac{z^{b_1}}{\Gamma(a_1 - b_1)} {}_1\tilde{F}_1(1 - a_1 + b_1; b_1 - b_2 + 1; -z) - \frac{z^{b_2}}{\Gamma(a_1 - b_2)} {}_1\tilde{F}_1(1 - a_1 + b_2; 1 - b_1 + b_2; -z)\right) /; b_2 - b_1 \notin \mathbb{Z}$$

07.34.03.0612.01

$$G_{1,2}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, c \end{matrix}\right) = e^{-z} z^b U(a - c, b - c + 1, z)$$

07.34.03.0613.01

$$G_{1,2}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, a - 1 \end{matrix}\right) = z^{a-1} \Gamma(b - a + 1, z)$$

07.34.03.0614.01

$$G_{1,2}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, a - 1 \end{matrix}\right) = \Gamma(b - a + 1) z^{a-1} Q(b - a + 1, z)$$

07.34.03.0615.01

$$G_{1,2}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, a - 1 \end{matrix}\right) = z^b E_{a-b}(z)$$

07.34.03.0616.01

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

07.34.03.0617.01

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

07.34.03.0618.01

$$G_{1,2}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ a - 1, a - 1 \end{matrix}\right) = -\frac{1}{2} z^{a-1} \left(2 \operatorname{Ei}(-z) + \log\left(-\frac{1}{z}\right) - \log(-z) + 2 \log(z)\right)$$

07.34.03.0619.01

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

Case $\{m, n, p, q\} = \{2, 0, 1, 3\}$

07.34.03.0620.01

$$G_{1,3}^{2,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi \csc(\pi (b_2 - b_1)) \left(\frac{z^{b_1}}{\Gamma(a_1 - b_1)} \, {}_1\tilde{F}_2(1 - a_1 + b_1; b_1 - b_2 + 1, b_1 - b_3 + 1; -z) - \frac{z^{b_2}}{\Gamma(a_1 - b_2)} \, {}_1\tilde{F}_2(1 - a_1 + b_2; 1 - b_1 + b_2, b_2 - b_3 + 1; -z) \right) /; b_2 - b_1 \notin \mathbb{Z}$$

07.34.03.0621.01

$$G_{1,3}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, c, a \end{matrix}\right) = z^{\frac{b+c}{2}} \left(J_{b-c}\left(2\sqrt{z}\right) \cos((c-a)\pi) + Y_{b-c}\left(2\sqrt{z}\right) \sin((c-a)\pi) \right)$$

07.34.03.0622.01

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

07.34.03.0623.01

$$G_{1,3}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, b+\frac{1}{2}, a-1 \end{matrix}\right) = \frac{i\, 4^{a-b-1} z^{a-1}}{\sqrt{\pi}} \left(\Gamma\left(2b - 2a + 2, 2\sqrt{-z}\right) - \Gamma\left(2b - 2a + 2, -2\sqrt{-z}\right) \right) /; \operatorname{Im}(z) < 0$$

07.34.03.0624.01

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

07.34.03.0625.01

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

07.34.03.0626.01

$$G_{1,3}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, a-1, b-\frac{1}{2} \end{matrix}\right) = \frac{2^{2a-2b-1} e^{-i(a+b)\pi} z^{a-1}}{\sqrt{\pi}} \left(e^{2ib\pi} \Gamma\left(2b - 2a + 1, -2\sqrt{-z}\right) + e^{2ia\pi} \Gamma\left(2b - 2a + 1, 2\sqrt{-z}\right) \right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

07.34.03.0627.01

$$G_{1,3}^{2,0}\left(z \,\middle|\, \begin{matrix} a \\ b, a-1, b+\frac{1}{2} \end{matrix}\right) = -\frac{4^{a-b-1} e^{-i(a+b)\pi} z^{a-1}}{\sqrt{\pi}} \left(e^{2ib\pi} \Gamma\left(-2a + 2b + 2, -2\sqrt{-z}\right) + e^{2ia\pi} \Gamma\left(-2a + 2b + 2, 2\sqrt{-z}\right) \right) /; \operatorname{Im}(z) < 0$$

07.34.03.0628.01

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

07.34.03.0629.01

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

07.34.03.0630.01

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

07.34.03.0631.01

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

07.34.03.0632.01

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

07.34.03.0633.01

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

07.34.03.0634.01

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

07.34.03.0635.01

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

07.34.03.0636.01

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

07.34.03.0637.01

$$G_{1,3}^{2,0}\left(z \middle| \begin{matrix} a \\ a-1,\, a-\frac{3}{4},\, a-\frac{1}{4} \end{matrix}\right) = z^{a-1}\left(1 - 2\,C\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)$$

07.34.03.0638.01

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

07.34.03.0639.01

$$G_{1,3}^{2,0}\left(z \middle| \begin{matrix} a \\ a-1,\, a-\frac{1}{4},\, a-\frac{3}{4} \end{matrix}\right) = z^{a-1}\left(1 - 2\,S\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)$$

Case $\{m, n, p, q\} = \{2, 0, 1, 4\}$

07.34.03.1092.01

$$G_{1,4}^{2,0}\left(z \middle| \begin{matrix} a_1 \\ b_1,\, b_2,\, b_3,\, b_4 \end{matrix}\right) = \pi \csc(\pi(b_1-b_2)) \left(\frac{z^{b_2}\, {}_1\tilde{F}_3(-a_1+b_2+1;\, -b_1+b_2+1,\, b_2-b_3+1,\, b_2-b_4+1;\, -z)}{\Gamma(a_1-b_2)} - \frac{z^{b_1}\, {}_1\tilde{F}_3(-a_1+b_1+1;\, b_1-b_2+1,\, b_1-b_3+1,\, b_1-b_4+1;\, -z)}{\Gamma(a_1-b_1)}\right) /;\; b_2-b_1 \notin \mathbb{Z}$$

07.34.03.1093.01

$$G_{1,4}^{3,0}\left(z \middle| \begin{matrix} a \\ a-\frac{1}{2},\, a-\frac{1}{6},\, a+\frac{1}{6},\, a \end{matrix}\right) = \frac{2z^{a-\frac{1}{2}}}{\sqrt{3}} e^{-\frac{1}{2}\left(3\sqrt[3]{z}\right)} \cos\left(\frac{3}{2}\sqrt{3}\,\sqrt[3]{z}\right)$$

Case $\{m, n, p, q\} = \{2, 0, 1, 5\}$

07.34.03.0640.01

$$G_{1,5}^{2,0}\left(z \middle| \begin{array}{c} a_1 \\ b_1, b_2, b_3, b_4, b_5 \end{array}\right) = \pi \csc(\pi(b_2 - b_1)) \left(\frac{z^{b_1}}{\Gamma(a_1 - b_1)} \, {}_1\tilde{F}_4(b_1 - a_1 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1, b_1 - b_5 + 1; -z) - \frac{z^{b_2}}{\Gamma(a_1 - b_2)} \, {}_1\tilde{F}_4(b_2 - a_1 + 1; b_2 - b_1 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1, b_2 - b_5 + 1; -z) \right) /; b_2 - b_1 \notin \mathbb{Z}$$

07.34.03.0641.01

$$G_{1,5}^{2,0}\left(z \middle| \begin{array}{c} a \\ b, b + \frac{1}{2}, a - \frac{1}{2}, a, 2b - a + \frac{1}{2} \end{array}\right) = \frac{z^b}{\sqrt{\pi}} I_{2a-2b-1}\left(2\sqrt{2}\sqrt[4]{z}\right) J_{2b-2a+1}\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0642.01

$$G_{1,5}^{2,0}\left(z \middle| \begin{array}{c} a \\ a - \frac{1}{4}, a + \frac{1}{4}, a - \frac{1}{2}, a, a \end{array}\right) = \frac{z^{a-\frac{1}{2}}}{\sqrt{2}\,\pi^{3/2}} \cosh\left(2\sqrt{2}\sqrt[4]{z}\right) \sin\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0643.01

$$G_{1,5}^{2,0}\left(z \middle| \begin{array}{c} a \\ a + \frac{1}{4}, a + \frac{3}{4}, a, a, a + \frac{1}{2} \end{array}\right) = -\frac{z^a}{\sqrt{2}\,\pi^{3/2}} \cos\left(2\sqrt{2}\sqrt[4]{z}\right) \sinh\left(2\sqrt{2}\sqrt[4]{z}\right)$$

Case $\{m, n, p, q\} = \{2, 0, 2, 2\}$

07.34.03.0644.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2 \end{array}\right) = \pi \csc(\pi(b_2 - b_1)) \left(\frac{1}{\Gamma(a_1 - b_1)\,\Gamma(a_2 - b_1)} z^{b_1} \, {}_2\tilde{F}_1(1 - a_1 + b_1, 1 - a_2 + b_1; b_1 - b_2 + 1; z) - \frac{1}{\Gamma(a_1 - b_2)\,\Gamma(a_2 - b_2)} z^{b_2} \, {}_2\tilde{F}_1(1 - a_1 + b_2, 1 - a_2 + b_2; 1 - b_1 + b_2; z) \right) \theta(1 - |z|)$$

07.34.03.0645.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2 \end{array}\right) = z^{b_1} (1 - z)^{a_1 + a_2 - b_1 - b_2 - 1} \, {}_2\tilde{F}_1(a_2 - b_2, a_1 - b_2; a_1 + a_2 - b_1 - b_2; 1 - z)\, \theta(1 - |z|)$$

07.34.03.0646.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2 \end{array}\right) = z^{b_1 + b_2 - a_2} (1 - z)^{a_1 + a_2 - b_1 - b_2 - 1} \, {}_2\tilde{F}_1\left(a_2 - b_1, a_2 - b_2; a_1 + a_2 - b_1 - b_2; 1 - \frac{1}{z}\right) \theta(1 - |z|) /; z \notin (-1, 0)$$

07.34.03.0647.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, c \\ b, d \end{array}\right) = \frac{\Gamma(b - a + 1)\,\theta(1 - |z|)}{\Gamma(c - d)} z^d (1 - z)^{a-b+c-d-1} P_{b-a}^{(a-b+c-d-1, d-b)}(2z - 1)$$

07.34.03.0648.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, c \\ b, d \end{array}\right) = \frac{\Gamma(d - a + 1)\,\theta(1 - |z|)}{\Gamma(c - b)} z^{b+d-a} (1 - z)^{a-b+c-d-1} P_{d-a}^{(a-b+c-d-1, a-c)}\left(\frac{2}{z} - 1\right)$$

07.34.03.0649.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, c \\ b, 2a - b - 1 \end{array}\right) = \frac{\Gamma(b - c + 1)\,\theta(1 - |z|)}{\Gamma(c - a + 1)\,(2c - 2a + 1)_{b-c}} (1 - z)^{c-a} z^{2a-c-1} C_{b-c}^{\frac{1}{2}+c-a}\left(\frac{2}{z} - 1\right)$$

07.34.03.0650.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, 2a-b-1 \end{array}\right.\right) = \theta(1-|z|)\,(1-z)^{\frac{c-a}{2}}\, z^{a-1}\, \mathfrak{P}_{a-b-1}^{a-c}\left(\frac{2}{z}-1\right)$$

07.34.03.0651.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, 2a-b-1 \end{array}\right.\right) = \frac{e^{i\left(\frac{1}{2}-a+b\right)\pi}\, \theta(1-|z|)}{\sqrt{\pi}\, \Gamma(c-b)}\, (1-z)^{\frac{1}{4}(2c-2a-1)}\, z^{a-\frac{1}{2}}\, \mathfrak{Q}_{c-a-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\frac{2-z}{2\sqrt{1-z}}\right) \;/;\; \mathrm{Re}(z)>0$$

07.34.03.0652.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, b+\frac{1}{2} \end{array}\right.\right) = 2^{a-2b+c-\frac{3}{2}}\, \theta(1-|z|)\,(1-z)^{\frac{1}{4}(2a+2c-3)-b}\, z^{b}\, P_{c-a-\frac{1}{2}}^{2b-a-c+\frac{3}{2}}\left(\sqrt{z}\right)$$

07.34.03.0653.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, b+c-a \end{array}\right.\right) = \frac{\sqrt{\pi}\, \theta(1-|z|)}{\Gamma(a-b)}\, (1-z)^{a-b-\frac{1}{2}}\, z^{b+\frac{1}{4}(2c-2a-1)}\, \mathfrak{P}_{c-a-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\frac{z+1}{2\sqrt{z}}\right)$$

07.34.03.0654.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, b+c-a \end{array}\right.\right) = \frac{2\, e^{i(a-c)\pi}\, \theta(1-|z|)}{\Gamma(a-b)\,\Gamma(c-b)}\, z^{b+\frac{c-a}{2}}\, (1-z)^{a-b-1}\, \mathfrak{Q}_{a-b-1}^{c-a}\left(\frac{1+z}{1-z}\right)$$

07.34.03.0655.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, a-b+c-\frac{1}{2} \end{array}\right.\right) =$$

$$\frac{2^{2b-a-c-\frac{1}{2}}\, \Gamma(b-a+1)\,\Gamma(b-c+1)}{\pi\sqrt{1-z}}\, z^{\frac{1}{4}(2a+2c-1)}\, \theta(1-|z|)\left(P_{c-a-\frac{1}{2}}^{a-2b+c-\frac{1}{2}}\left(-\sqrt{1-z}\right)+P_{c-a-\frac{1}{2}}^{a-2b+c-\frac{1}{2}}\left(\sqrt{1-z}\right)\right)$$

07.34.03.0656.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, \frac{a+c-1}{2} \end{array}\right.\right) = \frac{\Gamma(b-c+1)\,\theta(1-|z|)}{\Gamma\left(\frac{1}{2}(a-2b+c+1)\right)(a-2b+c)_{b-c}}\, (1-z)^{\frac{1}{2}(a-2b+c-1)}\, z^{\frac{1}{2}(a+c-1)}\, C_{b-c}^{\frac{1}{2}(a-2b+c)}(2z-1)$$

07.34.03.0657.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, c \\ b, \frac{a+c-1}{2} \end{array}\right.\right) = \theta(1-|z|)\,(1-z)^{\frac{a-2b+c-1}{4}}\, z^{\frac{a+2b+c-1}{4}}\, P_{\frac{1}{2}(a-c-1)}^{b+\frac{1}{2}(1-a-c)}(2z-1)$$

07.34.03.0658.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, c \end{array}\right.\right) = \frac{\Gamma(2c-2a+1)\,\theta(1-|z|)}{\Gamma\left(2a-b-c+\frac{1}{2}\right)(4a-2(b+c))_{2c-2a}}\, z^{b+c-a}\, (1-z)^{2a-b-c-\frac{1}{2}}\, C_{2c-2a}^{2a-b-c}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0659.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, c \end{array}\right.\right) = 2^{2a-b-c-\frac{1}{2}}\, \theta(1-|z|)\,(1-z)^{a-\frac{1}{4}(2b+2c+1)}\, z^{\frac{1}{4}(2b+2c-1)}\, \mathfrak{P}_{c-b-\frac{1}{2}}^{b+c-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0660.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, c \end{array}\right.\right) = \frac{2^{2a-b-c}\, e^{i(c-b)\pi}\, \theta(1-|z|)}{\sqrt{\pi}\, \Gamma(2(a-c))}\, (1-z)^{a-\frac{b+c+1}{2}}\, z^{\frac{b+c}{2}}\, \mathfrak{Q}_{2a-b-c-1}^{b-c}\left(\frac{1}{\sqrt{1-z}}\right)$$

07.34.03.0661.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b-1 \end{array}\right.\right) = \frac{2\,\theta(1-|z|)}{(2b-2a+1)\sqrt{\pi}}\, z^{a-\frac{1}{2}}\, \sinh\left((2b-2a+1)\tanh^{-1}\left(\sqrt{1-z}\right)\right)$$

07.34.03.0662.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b-1 \end{array}\right) = \frac{4\,\theta(1-|z|)}{(2a-2b-1)\sqrt{\pi}} z^{a-\frac{3}{2}} \sqrt{1-z}\, U_{a-b-\frac{3}{2}}\left(\frac{2}{z}-1\right)$$

07.34.03.0663.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b-1 \end{array}\right) = \frac{8\,\theta(1-|z|)}{(2a-2b-1)\sqrt{\pi}} z^{a-\frac{5}{2}} \sqrt{1-z}\,(2-z)\, U_{\frac{2a-2b-5}{4}}\left(\frac{z^2-8z+8}{z^2}\right) /; \operatorname{Re}(z)>0$$

07.34.03.0664.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b-1 \end{array}\right) = \frac{\theta(1-|z|)}{\sqrt{\pi}\,(2b-2a+1)} z^b \left(\left(1-\sqrt{1-z}\right)^{2a-2b-1} - \left(1+\sqrt{1-z}\right)^{2a-2b-1}\right)$$

07.34.03.0665.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b-1 \end{array}\right) = \frac{2^{2(b-a)+1}\,\theta(1-|z|)}{\sqrt{\pi}\,(2b-2a+1)} z^b \left(\left(\sqrt{1+\sqrt{z}} - \sqrt{1-\sqrt{z}}\right)^{4a-4b-2} - \left(\sqrt{1+\sqrt{z}} + \sqrt{1-\sqrt{z}}\right)^{4a-4b-2}\right)$$

07.34.03.0666.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b \end{array}\right) = \frac{\theta(1-|z|)}{2\sqrt{\pi}\,\sqrt{1-z}} z^b \left(\left(1-\sqrt{1-z}\right)^{2(a-b)} + \left(1+\sqrt{1-z}\right)^{2(a-b)}\right)$$

07.34.03.0667.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b \end{array}\right) = \frac{2^{2(b-a)-1}\,\theta(1-|z|)}{\sqrt{\pi}\,\sqrt{1-z}} z^b \left(\left(\sqrt{1+\sqrt{z}} - \sqrt{1-\sqrt{z}}\right)^{4(a-b)} + \left(\sqrt{1+\sqrt{z}} + \sqrt{1-\sqrt{z}}\right)^{4(a-b)}\right)$$

07.34.03.0668.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b \end{array}\right) = \frac{z^a}{\sqrt{\pi}\,\sqrt{1-z}} T_{a-b}\left(\frac{2}{z}-1\right) \theta(1-|z|)$$

07.34.03.0669.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2} \\ b, 2a-b \end{array}\right) = \frac{z^a\,\theta(1-|z|)}{\sqrt{\pi}\,\sqrt{1-z}} T_{\frac{a-b}{2}}\left(\frac{z^2-8z+8}{z^2}\right) /; \operatorname{Re}(z)>0$$

07.34.03.0670.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, 2b-a+1 \\ b, b \end{array}\right) = z^b P_{b-a}(2z-1)\,\theta(1-|z|)$$

07.34.03.0671.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array}\right) = \frac{\theta(1-|z|)}{\sqrt{\pi}\,\sqrt{1-z}} z^b \cos\left((2a-2b-1)\cos^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0672.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, 2b-a+1 \\ b, b+\frac{1}{2} \end{array}\right) = \frac{z^b}{\sqrt{\pi}\,\sqrt{1-z}} T_{a-b-\frac{1}{2}}(2z-1)\,\theta(1-|z|)$$

07.34.03.0673.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, 2b-a+2 \\ b, b+\frac{1}{2} \end{array}\right) = \frac{\theta(1-|z|)}{(a-b-1)\sqrt{\pi}} z^b \sin\left(2(a-b-1)\cos^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0674.01

$$G_{2,2}^{2,0}\left(z \middle| \begin{array}{c} a, 2b-a+2 \\ b, b+\frac{1}{2} \end{array}\right) = \frac{2\,\theta(1-|z|)}{(a-b-1)\sqrt{\pi}} z^{b+\frac{1}{2}} \sqrt{1-z}\, U_{a-b-2}(2z-1)$$

07.34.03.0675.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,b+\frac{1}{2}\\ b,\,a-\frac{1}{2}\end{matrix}\right)=z^{\frac{a+b-1}{2}}\,P_{b-a}\!\left(\frac{z+1}{2\sqrt{z}}\right)\theta(1-|z|)$$

07.34.03.0676.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,b+1\\ b,\,a-1\end{matrix}\right)=\frac{\theta(1-|z|)}{a-b-1}\,z^{\frac{a+b-3}{2}}\left(1-z^2\right)U_{\frac{a-b-3}{2}}\!\left(\frac{z^2+1}{2\,z}\right)$$

07.34.03.0677.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ b,\,2\,a-b-1\end{matrix}\right)=z^{a-1}\,P_{b-a}\!\left(\frac{2}{z}-1\right)\theta(1-|z|)$$

07.34.03.0678.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a+\frac{1}{2}\\ b,\,2\,a-b\end{matrix}\right)=\frac{\theta(1-|z|)}{\sqrt{\pi}\,\sqrt{1-z}}\,z^a\cosh\!\left(2\,(b-a)\tanh^{-1}\left(\sqrt{1-z}\right)\right)$$

07.34.03.0679.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}b-\left\lfloor\frac{n}{2}\right\rfloor,\,b+n-\left\lfloor\frac{n}{2}\right\rfloor+\frac{1}{2}\\ b,\,b\end{matrix}\right)=\frac{(-1)^{\left\lfloor\frac{n}{2}\right\rfloor}\left\lfloor\frac{n}{2}\right\rfloor!\;\theta(1-|z|)}{\Gamma\!\left(n-\left\lfloor\frac{n}{2}\right\rfloor+\frac{1}{2}\right)}\,(1-z)^{\frac{n-1}{2}-\left\lfloor\frac{n}{2}\right\rfloor}\,z^b\,P_n\!\left(\sqrt{1-z}\right)\;/;\;n\in\mathbb{N}$$

07.34.03.0680.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ a-\frac{3}{2},\,a+\frac{1}{2}\end{matrix}\right)=\frac{2\,\theta(1-|z|)}{\pi\left(1-\sqrt{1-z}\right)}\,z^{a-\frac{1}{2}}\,E\!\left(\frac{4\sqrt{1-z}}{\left(\sqrt{1-z}+1\right)^2}\right)\;/;\;|z|>1\lor\operatorname{Re}(z)>0$$

07.34.03.0681.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ a-\frac{3}{2},\,a+\frac{1}{2}\end{matrix}\right)=\frac{2\,\theta(1-|z|)}{\pi}\,z^{a-\frac{3}{2}}\left(\sqrt{1-z}+1\right)E\!\left(\frac{4\sqrt{1-z}}{\left(\sqrt{1-z}+1\right)^2}\right)\;/;\;|z|>1\lor\operatorname{Re}(z)>0$$

07.34.03.0682.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ a-\frac{3}{2},\,a+\frac{1}{2}\end{matrix}\right)=\frac{2\,\theta(1-|z|)}{\pi\left(\sqrt{1-z}+1\right)}\,z^{a-\frac{1}{2}}\,E\!\left(-\frac{4\sqrt{1-z}}{\left(1-\sqrt{1-z}\right)^2}\right)\;/;\;|z|>1\lor\operatorname{Re}(z)>0$$

07.34.03.0683.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ a-\frac{3}{2},\,a+\frac{1}{2}\end{matrix}\right)=\frac{2\,\theta(1-|z|)}{\pi}\,z^{a-\frac{3}{2}}\left(1-\sqrt{1-z}\right)E\!\left(-\frac{4\sqrt{1-z}}{\left(1-\sqrt{1-z}\right)^2}\right)\;/;\;|z|>1\lor\operatorname{Re}(z)>0$$

07.34.03.0684.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ a-1,\,a-1\end{matrix}\right)=-z^{a-1}\log(z)\,\theta(1-|z|)$$

07.34.03.0685.01

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

07.34.03.0686.01

$$G_{2,2}^{2,0}\left(z\,\middle|\,\begin{matrix}a,\,a\\ a-\frac{3}{4},\,a-\frac{1}{4}\end{matrix}\right)=\frac{2\,\theta(1-|z|)}{\pi}\,z^{a-\frac{3}{4}}\,K\!\left(\frac{1-\sqrt{z}}{2}\right)\;/;\;z\notin(-1,\,0)$$

07.34.03.0687.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a-\frac{1}{4}\end{array}\right.\right)=\frac{2\sqrt{2}}{\pi\sqrt{\sqrt{z}+1}}z^{a-\frac{3}{4}}\theta(1-|z|)K\left(\frac{\sqrt{z}-1}{\sqrt{z}+1}\right)/;z\notin(-1,0)$$

07.34.03.0688.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a-\frac{1}{4}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi\sqrt{\sqrt{z-1}+\sqrt{z}}}z^{a-\frac{3}{4}}K\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}+\sqrt{z}}\right)/;z\notin(-1,0)$$

07.34.03.0689.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a-\frac{1}{4}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi\sqrt{\sqrt{z}-\sqrt{z-1}}}z^{a-\frac{3}{4}}K\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right)/;\ \notin(-1,0)$$

07.34.03.0690.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a-\frac{1}{4}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi}\sqrt{\sqrt{z-1}+\sqrt{z}}\;z^{a-\frac{3}{4}}K\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right)/;z\notin(-1,0)$$

07.34.03.0691.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi}z^{a-\frac{1}{2}}K(1-z)/;z\notin(-1,0)$$

07.34.03.0692.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi}z^{a-1}K\left(1-\frac{1}{z}\right)/;z\notin(-1,0)$$

07.34.03.0693.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi}z^{a-\frac{3}{4}}K\left(-\frac{\left(\sqrt{z}-1\right)^2}{4\sqrt{z}}\right)/;z\notin(-1,0)$$

07.34.03.0694.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{4}{\pi\left(\sqrt{z}+1\right)}z^{a-\frac{1}{2}}\theta(1-|z|)K\left(\left(\frac{1-\sqrt{z}}{1+\sqrt{z}}\right)^2\right)/;z\notin(-1,0)$$

07.34.03.0695.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi\left(\sqrt{1-z}+1\right)}z^{a-\frac{1}{2}}K\left(\frac{4\sqrt{1-z}}{\left(\sqrt{1-z}+1\right)^2}\right)/;\mathrm{Re}(z)>0$$

07.34.03.0696.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi\left(1-\sqrt{1-z}\right)}z^{a-\frac{1}{2}}K\left(-\frac{4\sqrt{1-z}}{\left(\sqrt{1-z}-1\right)^2}\right)/;\mathrm{Re}(z)>0$$

07.34.03.0697.01

$$G_{2,2}^{2,0}\left(z\left|\begin{array}{c}a,a+\frac{1}{2}\\a-\frac{3}{4},a+\frac{1}{4}\end{array}\right.\right)=\frac{2\,\theta(1-|z|)}{\pi\sqrt{1-\sqrt{1-z}}}z^{a-\frac{1}{4}}E\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right)/;\ \notin(-1,0)$$

07.34.03.0698.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{array}\right) = \frac{2\,\theta(1-|z|)}{\pi} \sqrt{\sqrt{1-z}+1}\; z^{a-\frac{3}{4}}\, E\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right) /;\; \notin (-1,\, 0)$$

07.34.03.0699.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{array}\right) = \frac{2\,\theta(1-|z|)}{\pi}\, z^{a-\frac{3}{4}} \sqrt{1-\sqrt{1-z}}\; E\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\; \notin (-1,\, 0)$$

07.34.03.0700.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{3}{4},\, a+\frac{1}{4} \end{array}\right) = \frac{2\,\theta(1-|z|)}{\pi\sqrt{\sqrt{1-z}+1}}\, z^{a-\frac{1}{4}}\, E\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\; \notin (-1,\, 0)$$

07.34.03.0701.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{2},\, a-\frac{1}{2} \end{array}\right) = \frac{2\,z^{a-\frac{1}{2}}}{\sqrt{\pi}} \log\left(\frac{\sqrt{1-z}+1}{\sqrt{z}}\right) \theta(1-|z|)$$

07.34.03.0702.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{2},\, a-\frac{1}{2} \end{array}\right) = -\frac{2\,z^{a-\frac{1}{2}}}{\sqrt{\pi}} \log\left(\frac{1-\sqrt{1-z}}{\sqrt{z}}\right) \theta(1-|z|)$$

07.34.03.0703.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array}\right) = \frac{2\,z^{a-\frac{1}{2}}\,\theta(1-|z|)}{\pi}\, K\left(\frac{\sqrt{z}-1}{2\sqrt{z}}\right) /;\; z \notin (-1,\, 0)$$

07.34.03.0704.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array}\right) = \frac{2\sqrt{2}\;\theta(1-|z|)}{\pi\sqrt{\sqrt{z}+1}}\, z^{a-\frac{1}{4}}\, K\left(\frac{1-\sqrt{z}}{1+\sqrt{z}}\right) /;\; z \notin (-1,\, 0)$$

07.34.03.0705.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array}\right) = \frac{2\,z^{a-\frac{3}{4}}\,\theta(1-|z|)}{\pi} \sqrt{1-\sqrt{1-z}}\; K\left(\frac{2\sqrt{1-z}\left(1-\sqrt{1-z}\right)}{z}\right) /;\; z \notin (-1,\, 0)$$

07.34.03.0706.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array}\right) = \frac{2\,z^{a-\frac{3}{4}}\,\theta(1-|z|)}{\pi} \sqrt{1-\sqrt{1-z}}\; K\left(\frac{2\sqrt{1-z}}{1+\sqrt{1-z}}\right) /;\; z \notin (-1,\, 0)$$

07.34.03.0707.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array}\right) = \frac{2\,\theta(1-|z|)}{\pi\sqrt{\sqrt{1-z}+1}}\, z^{a-\frac{1}{4}}\, K\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}\right) /;\; z \notin (-1,\, 0)$$

07.34.03.0708.01

$$G_{2,2}^{2,0}\left(z \,\middle|\, \begin{array}{c} a,\, a+\frac{1}{2} \\ a-\frac{1}{4},\, a-\frac{1}{4} \end{array}\right) = \frac{2\,\theta(1-|z|)}{\pi\sqrt{1-\sqrt{1-z}}}\, z^{a-\frac{1}{4}}\, K\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\; z \notin (-1,\, 0)$$

07.34.03.0709.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ a-\frac{1}{4}, a-\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi\sqrt{1-\sqrt{1-z}}}\, z^{a-\frac{1}{4}}\, K\left(\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}\right) /;\, z \notin (-1, 0)$$

07.34.03.0710.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+1 \\ a-\frac{1}{2}, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi}\, z^{a-\frac{1}{2}}\, E(1-z) /;\, z \notin (-1, 0)$$

07.34.03.0711.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+1 \\ a-\frac{1}{2}, a+\frac{1}{2} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi}\, z^{a}\, E\left(1-\frac{1}{z}\right) /;\, z \notin (-1, 0)$$

07.34.03.0712.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+1 \\ a-\frac{1}{4}, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi}\, z^{a-\frac{1}{4}} \sqrt{\sqrt{z-1}+\sqrt{z}}\; E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}+\sqrt{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.0713.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+1 \\ a-\frac{1}{4}, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi\sqrt{\sqrt{z}-\sqrt{z-1}}}\, z^{a-\frac{1}{4}}\, E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}+\sqrt{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.0714.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+1 \\ a-\frac{1}{4}, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi}\, z^{a-\frac{1}{4}} \sqrt{-\sqrt{z-1}+\sqrt{z}}\; E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right)$$

07.34.03.0715.01

$$G_{2,2}^{2,0}\left(z \left| \begin{array}{c} a, a+1 \\ a-\frac{1}{4}, a+\frac{1}{4} \end{array} \right.\right) = \frac{2\,\theta(1-|z|)}{\pi\sqrt{\sqrt{z-1}+\sqrt{z}}}\, z^{a-\frac{1}{4}}\, E\left(\frac{2\sqrt{z-1}}{\sqrt{z-1}-\sqrt{z}}\right) /;\, z \notin (-1, 0)$$

Case $\{m, n, p, q\} = \{2, 0, 2, 3\}$

07.34.03.0716.01

$$G_{2,3}^{2,0}\left(z \left| \begin{array}{c} a_1, a_2 \\ b_1, b_2, b_3 \end{array} \right.\right) = \pi \csc(\pi\,(b_2-b_1)) \left(\frac{z^{b_1}}{\Gamma(a_1-b_1)\,\Gamma(a_2-b_1)}\, {}_2\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1, b_1-b_3+1; z) - \frac{z^{b_2}}{\Gamma(a_1-b_2)\,\Gamma(a_2-b_2)}\, {}_2\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2; 1-b_1+b_2, b_2-b_3+1; z)\right) /;\, b_2-b_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 0, 2, 4\}$

07.34.03.1094.01

$$G_{2,4}^{2,0}\left(z \left| \begin{array}{c} a_1, a_2 \\ b_1, b_2, b_3, b_4 \end{array} \right.\right) = \pi \csc(\pi\,(b_1-b_2)) \left(\frac{z^{b_2}\, {}_2\tilde{F}_3(-a_1+b_2+1, -a_2+b_2+1; -b_1+b_2+1, b_2-b_3+1, b_2-b_4+1; z)}{\Gamma(a_1-b_2)\,\Gamma(a_2-b_2)} - \frac{z^{b_1}\, {}_2\tilde{F}_3(-a_1+b_1+1, -a_2+b_1+1; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1; z)}{\Gamma(a_1-b_1)\,\Gamma(a_2-b_1)}\right) /;\, \neg\, b_2-b_1 \in \mathbb{Z}$$

07.34.03.1095.01

$$G_{2,4}^{2,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, c,\, 2a-c \end{matrix}\right) = \frac{z^a \left(I_{2a-b-c}\left(\sqrt{z}\right) I_{c-b}\left(\sqrt{z}\right) + I_{b-c}\left(\sqrt{z}\right) I_{-2a+b+c}\left(\sqrt{z}\right)\right)}{2\sqrt{\pi}} \;/;\; \neg\, b_2 - b_1 \in \mathbb{Z}$$

07.34.03.1096.01

$$G_{2,4}^{2,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, a,\, a \end{matrix}\right) = \frac{z^a}{2\sqrt{\pi}} \left(I_{a-b}\left(\sqrt{z}\right)^2 + I_{b-a}\left(\sqrt{z}\right)^2\right)$$

07.34.03.1097.01

$$G_{2,4}^{2,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, 2a-b-\frac{1}{2},\, b+\frac{1}{2} \end{matrix}\right) = \frac{1}{\sqrt{2}\,\pi} z^{a-\frac{1}{4}} \left(I_{-2a+2b+\frac{1}{2}}\left(\sqrt{z}\right)\cosh\left(\sqrt{z}\right) + I_{2a-2b-\frac{1}{2}}\left(\sqrt{z}\right)\sinh\left(\sqrt{z}\right)\right)$$

07.34.03.1098.01

$$G_{2,4}^{2,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, a,\, a+\frac{1}{2} \end{matrix}\right) = \frac{z^a}{2\pi} \left(I_{2b-2a}\left(2\sqrt{z}\right) + I_{2a-2b}\left(2\sqrt{z}\right)\right)$$

07.34.03.1099.01

$$G_{2,4}^{2,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ a,\, a,\, a-\frac{1}{2},\, a-\frac{1}{2} \end{matrix}\right) = \frac{2\, z^{a-\frac{1}{2}}}{\pi^{3/2}} \operatorname{Shi}\left(2\sqrt{z}\right)$$

07.34.03.1100.01

$$\operatorname{Chi}\left(\sqrt{z}\right) = -\frac{1}{2}\pi^{3/2}\, G_{2,4}^{2,0}\left(\frac{z}{4} \,\middle|\, \begin{matrix} \frac{1}{2},\, 1 \\ 0,\, 0,\, \frac{1}{2},\, \frac{1}{2} \end{matrix}\right)$$

07.34.03.1101.01

$$G_{2,4}^{2,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{2},\, a-\frac{1}{2},\, a,\, a \end{matrix}\right) = -\frac{2\, z^{a-\frac{1}{2}}}{\pi^{3/2}} \operatorname{Chi}\left(2\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{2, 0, 3, 3\}$

07.34.03.0717.01

$$G_{3,3}^{2,0}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2,\, a_3 \\ b_1,\, b_2,\, b_3 \end{matrix}\right) = \pi\csc(\pi(b_2-b_1))\left(\frac{z^{b_1}}{\Gamma(a_1-b_1)\,\Gamma(a_2-b_1)\,\Gamma(a_3-b_1)}\, {}_3\tilde{F}_2(1-a_1+b_1,\, 1-a_2+b_1,\, 1-a_3+b_1;\, b_1-b_2+1,\, b_1-b_3+1;\, -z) - \frac{z^{b_2}}{\Gamma(a_1-b_2)\,\Gamma(a_2-b_2)\,\Gamma(a_3-b_2)}\, {}_3\tilde{F}_2(1-a_1+b_2,\, 1-a_2+b_2,\, 1-a_3+b_2;\, 1-b_1+b_2,\, b_2-b_3+1;\, -z)\right)\theta(1-|z|) \;/;\; b_2-b_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 1, 1, 2\}$

07.34.03.0718.01

$$G_{1,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1,\, b_2 \end{matrix}\right) = \Gamma(b_1-a_1+1)\,\Gamma(b_2-b_1)\, {}_1F_1(b_1-a_1+1;\, b_1-b_2+1;\, z)\, z^{b_1} + \Gamma(b_1-b_2)\,\Gamma(b_2-a_1+1)\, {}_1F_1(b_2-a_1+1;\, b_2-b_1+1;\, z)\, z^{b_2} \;/;\; b_2-b_1 \notin \mathbb{Z}$$

07.34.03.0719.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a_1\\b_1,\,b_2\end{matrix}\right)=\Gamma(1-a_1+b_1)\,\Gamma(1-a_1+b_2)\,z^{b_1}\,U(1-a_1+b_1,\,b_1-b_2+1,\,z)$$

07.34.03.0720.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,2a-b-2\end{matrix}\right)=\frac{\sqrt{\pi}\,\csc((a-b)\pi)}{2(a-b-1)}\,z^{a-\frac{1}{2}}\,e^{z/2}\left(K_{a-b-\frac{1}{2}}\left(\frac{z}{2}\right)+K_{a-b-\frac{3}{2}}\left(\frac{z}{2}\right)\right)$$

07.34.03.0721.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,2a-b-1\end{matrix}\right)=\sqrt{\pi}\,\csc((a-b)\pi)\,z^{a-\frac{1}{2}}\,e^{z/2}\,K_{b-a+\frac{1}{2}}\left(\frac{z}{2}\right)$$

07.34.03.0722.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,2a-b\end{matrix}\right)=\frac{\sqrt{\pi}\,\csc((a-b)\pi)}{2}\,z^{a+\frac{1}{2}}\,e^{z/2}\left(K_{b-a-\frac{1}{2}}\left(\frac{z}{2}\right)-K_{b-a+\frac{1}{2}}\left(\frac{z}{2}\right)\right)$$

07.34.03.0723.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,a\end{matrix}\right)=e^{z}\,z^{b}\,\Gamma(b-a+1)\,\Gamma(a-b,\,z)$$

07.34.03.0724.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,a\end{matrix}\right)=\Gamma(b-a+1)\,z^{a}\,e^{z}\,E_{b-a+1}(z)$$

07.34.03.0725.01

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

07.34.03.0726.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\a,\,a\end{matrix}\right)=-e^{z}\,z^{a}\left(\operatorname{Ei}(-z)+\frac{1}{2}\left(\log\left(-\frac{1}{z}\right)-\log(-z)\right)+\log(z)\right)$$

07.34.03.1102.01

$$G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,b+\frac{1}{2}\end{matrix}\right)=2\sqrt{\pi}\,z^{b}\,\Gamma(2b-2a+2)\,H_{2a-2b-2}\left(\sqrt{z}\right)\,/;\,2a-2b\notin\mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 1, 1, 3\}$

07.34.03.0727.01

$$G_{1,3}^{2,1}\left(z\,\middle|\,\begin{matrix}a_1\\b_1,\,b_2,\,b_3\end{matrix}\right)=\pi\csc(\pi(b_2-b_1))\left(\Gamma(1-a_1+b_1)\,z^{b_1}\,{}_1\tilde{F}_2(1-a_1+b_1;\,b_1-b_2+1,\,b_1-b_3+1;\,z)-\right.$$
$$\left.\Gamma(1-a_1+b_2)\,z^{b_2}\,{}_1\tilde{F}_2(1-a_1+b_2;\,1-b_1+b_2,\,b_2-b_3+1;\,z)\right)\,/;\,b_2-b_1\notin\mathbb{Z}$$

07.34.03.0728.01

$$G_{1,3}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,2a-b-1,\,a-\frac{1}{2}\end{matrix}\right)=\pi^{3/2}\csc(2(a-b)\pi)\,z^{a-\frac{1}{2}}\left(I_{a-b-\frac{1}{2}}\left(\sqrt{z}\right)^2-I_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)^2\right)$$

07.34.03.0729.01

$$G_{1,3}^{2,1}\left(z\,\middle|\,\begin{matrix}a\\b,\,2a-b-1,\,a-\frac{1}{2}\end{matrix}\right)=\sqrt{\pi}\,\csc((a-b)\pi)\,z^{a-\frac{1}{2}}\left(I_{a-b-\frac{1}{2}}\left(\sqrt{z}\right)+I_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)\right)K_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0730.01

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

07.34.03.0731.01

$$G_{1,3}^{2,1}\left(z \middle| \begin{matrix} a \\ b, a, a-\frac{1}{2} \end{matrix}\right) = \pi z^{\frac{1}{4}(2a+2b-1)} \csc((a-b)\pi) \left(I_{b-a+\frac{1}{2}}\left(2\sqrt{z}\right) - \boldsymbol{L}_{a-b-\frac{1}{2}}\left(2\sqrt{z}\right)\right)$$

07.34.03.0732.01

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

07.34.03.0733.01

$$G_{1,3}^{2,1}\left(z \middle| \begin{matrix} a \\ a, a-\frac{1}{2}, b \end{matrix}\right) = \pi z^{\frac{1}{2}\left(a+b-\frac{1}{2}\right)} \left(I_{a-b-\frac{1}{2}}\left(2\sqrt{z}\right) - \boldsymbol{L}_{a-b-\frac{1}{2}}\left(2\sqrt{z}\right)\right)$$

Case $\{m, n, p, q\} = \{2, 1, 2, 2\}$

07.34.03.0734.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2 \end{matrix}\right) = \Gamma(1-a_1+b_1)\,\Gamma(1-a_1+b_2)\, z^{a_1-1}\, {}_2\tilde{F}_1\left(1-a_1+b_1, 1-a_1+b_2; 1-a_1+a_2; -\frac{1}{z}\right)$$

07.34.03.0735.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} b_1, b_2 \\ a_1, a_2 \end{matrix}\right) = \frac{\pi \csc(\pi(a_1-b_1))\,\Gamma(b_2-a_1+1)}{\Gamma(a_2-b_1)} z^{a_1-1} P_{a_1-b_1-1}^{(a_2-a_1, b_1+b_2-a_1-a_2+1)}\left(1+\frac{2}{z}\right)$$

07.34.03.0736.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, d \end{matrix}\right) = \Gamma(b-c+1)\,\Gamma(d-a+1)\, z^{b-c+d} (z+1)^{a-b+c-d-1} P_{b-c}^{(c-a, a-b+c-d-1)}\left(\frac{z+2}{z}\right) /; z \notin (-1, 0)$$

07.34.03.0737.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, d \end{matrix}\right) = \Gamma(b-a+1)\,\Gamma(d-c+1)\, z^{b} (z+1)^{a-b-1} P_{d-c}^{(c-a, b-d)}\left(\frac{z-1}{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.0738.01

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

07.34.03.0739.01

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

07.34.03.0740.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, c-1 \end{matrix}\right) = \Gamma(b-a+1) \left(-\frac{1}{z}\right)^{a-c} z^{a-1}\, \mathrm{B}_{-\frac{1}{z}}(c-a, a-b)$$

07.34.03.0741.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, c-1 \end{matrix}\right) = \frac{\pi \csc((a-b)\pi)\,\Gamma(c-a)}{\Gamma(c-b)} \left(-\frac{1}{z}\right)^{a-c} z^{a-1}\, I_{-\frac{1}{z}}(c-a, a-b)$$

07.34.03.0742.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \pi (-z-1)^{\frac{c-a}{2}} \left(-\frac{1}{z}\right)^{\frac{a-c}{2}} (-z)^{\frac{a-c}{2}} z^{a-1} \csc((a-b)\pi)\, P_{a-b-1}^{a-c}\left(\frac{z+2}{z}\right)$$

07.34.03.0743.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \pi \csc((a-b)\pi)\, z^{a-1} (z+1)^{\frac{c-a}{2}}\, \mathfrak{P}_{a-b-1}^{a-c}\left(\frac{z+2}{z}\right)$$

07.34.03.0744.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \frac{\pi \csc((a-b)\pi)\,\Gamma(2a-b-c)\,\Gamma(2c-2a+1)}{\Gamma(c-a+1)\,\Gamma(c-b)} z^{2a-c-1} (z+1)^{c-a} C_{2a-b-c-1}^{\frac{1}{2}+c-a}\left(\frac{z+2}{z}\right) /; z \notin (-1, 0)$$

07.34.03.0745.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2a-b-1 \end{matrix}\right) = \frac{e^{i\left(b-a+\frac{1}{2}\right)\pi} \sqrt{\pi} \csc((a-b)\pi)}{\Gamma(c-b)} z^{a-\frac{1}{2}} (z+1)^{\frac{1}{4}(2c-2a-1)} \mathfrak{Q}_{c-a-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\frac{z+2}{2\sqrt{z+1}}\right) /; \operatorname{Re}(z) \geq 0$$

07.34.03.0746.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2c-b-1 \end{matrix}\right) = \Gamma(b-a+1)\,\Gamma(2c-a-b)\, z^{c-1} (z+1)^{\frac{a-c}{2}} \mathfrak{P}_{b-c}^{a-c}\left(\frac{z+2}{z}\right) /; z \notin (-1, 0)$$

07.34.03.0747.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2c-b-1 \end{matrix}\right) = 4^{c-a} \sqrt{\pi}\, z^{a-1} \csc((a-b)\pi)\, \Gamma\left(c-a+\frac{1}{2}\right) C_{a-b-1}^{c-a+\frac{1}{2}}\left(\frac{z+2}{z}\right)$$

07.34.03.0748.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, 2c-b-1 \end{matrix}\right) = \frac{e^{\frac{\pi i}{2}(2b-2c+1)}\,\Gamma(b-a+1)}{\sqrt{\pi}} z^{c-\frac{1}{2}} (z+1)^{\frac{1}{4}(2a-2c-1)} \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\frac{z+2}{2\sqrt{z+1}}\right) /; \operatorname{Re}(z) \geq 0$$

07.34.03.0749.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, b-a+c \end{matrix}\right) = z^{\frac{c-a}{2}+b} \left(\frac{1}{z+1}\right)^{\frac{a-c}{2}} (1+z)^{\frac{3a-c}{2}-b-1}\, \Gamma(b-a+1)\,\Gamma(b+c-2a+1)\, P_{a-b-1}^{a-c}\left(\frac{z-1}{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0750.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, b-a+c \end{matrix}\right) = z^{b-a+c} (z+1)^{2a-b-c-1}\, \Gamma(b-c+1)\,\Gamma(2c-2a+1)\,(c-a+1)_{b-c}\, C_{b-c}^{c-a+\frac{1}{2}}\left(\frac{z-1}{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.0751.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, a-b+c-\frac{3}{2} \end{matrix}\right) = 2^{c-a} z^{\frac{1}{2}(a+c-2)}\, \Gamma(b-a+1)\,\Gamma\left(c-b-\frac{1}{2}\right) \mathfrak{P}_{a-2b+c-2}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /; z \notin (-1, 0)$$

07.34.03.0752.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, a-b+c-\frac{3}{2} \end{matrix}\right) = \frac{2^{2b-a-c+\frac{5}{2}} e^{i\pi\left(2b-a-c+\frac{3}{2}\right)}\,\Gamma(b-a+1)}{\Gamma(c-b)} z^{\frac{1}{2}\left(a+c-\frac{3}{2}\right)} \mathfrak{Q}_{c-a-\frac{1}{2}}^{a-2b+c-\frac{3}{2}}\left(\sqrt{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.0753.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, a-b+c-\frac{1}{2} \end{matrix}\right) = \frac{2^{c-a}\,\Gamma(b-a+1)\,\Gamma\left(c-b+\frac{1}{2}\right)}{\sqrt{z+1}} z^{\frac{1}{2}(a+c-1)} \mathfrak{P}_{2b-a-c}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /; z \notin (-1, 0)$$

07.34.03.0754.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, a-b+c-\frac{1}{2} \end{matrix}\right) = \frac{2^{2b-a-c+\frac{3}{2}} e^{i\left(2b-a-c+\frac{1}{2}\right)\pi}\,\Gamma(b-a+1)}{\sqrt{z+1}\,\Gamma(c-b)} z^{\frac{1}{4}(2a+2c-1)} \mathfrak{Q}_{c-a-\frac{1}{2}}^{a-2b+c-\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.0755.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, c \\ b, \frac{a+c-1}{2} \end{matrix}\right) = \sqrt{\pi}\,\Gamma(b-a+1)\, z^{\frac{1}{4}(a+2b+c-2)} (z+1)^{\frac{1}{4}(a-2b+c-2)} \mathfrak{P}_{-b+\frac{a+c}{2}-1}^{\frac{a-c}{2}}\left(\frac{2z+1}{2\sqrt{z}\,\sqrt{z+1}}\right) /; \operatorname{Re}(z) \geq 0$$

07.34.03.0756.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, \frac{a+c-1}{2} \end{matrix}\right) = \frac{2\, e^{\frac{\pi i}{2}(2b-a-c+1)}\, \Gamma(b-a+1)}{\Gamma(c-b)}\, z^{\frac{1}{4}(a+2b+c-1)}\, (z+1)^{\frac{1}{4}(a-2b+c-1)}\, \mathfrak{Q}_{\frac{1}{2}(c-a-1)}^{\frac{1}{2}(a+c-1)-b}(2z+1) \,/;\, z \notin (-1, 0)$$

07.34.03.0757.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, \frac{a+c-1}{2} \end{matrix}\right) = 2\, e^{\frac{\pi i}{2}(a-2b+c-1)}\, z^{\frac{1}{4}(a+2b+c-1)}\, (z+1)^{\frac{1}{4}(a-2b+c-1)}\, \mathfrak{Q}_{\frac{c-a-1}{2}}^{b+\frac{1-a-c}{2}}(2z+1) \,/;\, z \notin (-1, 0)$$

07.34.03.0758.01

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

07.34.03.0759.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 2^{2a-2b-1}\, (2b-2a+1)!\, z^b\, (z+1)^{a-b-1}\, T_{b-a+1}\left(\frac{z-1}{z+1}\right) /;\, z \notin (-1, 0)$$

07.34.03.0760.01

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

07.34.03.0761.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2} \\ b, 4a-3b-3 \end{matrix}\right) = \frac{\Gamma(3a-3b-2)\, \Gamma(b-a+1)}{\sqrt{\pi}}\, z^{2a-b-\frac{5}{3}}\, (z+1)^{b-a+\frac{2}{3}}\, {}_2F_1\left(a-b-\frac{2}{3}, b-a+\frac{5}{6}; \frac{1}{2}; -\frac{(9z+8)^2}{27z^2(z+1)}\right) /;$$
$$|z| > 1 \lor \mathrm{Re}(z) > 0$$

07.34.03.0762.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2} \\ b, 2a-b-2 \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((a-b)\pi)}{a-b-1}\, z^{a-1} \cosh\left(2(a-b-1)\,\mathrm{csch}^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0763.01

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

07.34.03.0764.01

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

07.34.03.0765.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2} \\ b, 2a-b-1 \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((a-b)\pi)}{\sqrt{1+\frac{1}{z}}}\, z^{a-1} \cosh\left((-2a+2b+1)\,\mathrm{csch}^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0766.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 2^{2a-2b-1}\, \Gamma(2b-2a+2)\, (z+1)^{a-b-1}\, z^b \cos\left(2(a-b-1)\cot^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0767.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a \\ b, b \end{matrix}\right) = (b-a)!^2\, z^b (z+1)^{a-b-1}\, P_{b-a}\left(\frac{z-1}{z+1}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0768.01

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

07.34.03.0769.01

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

07.34.03.0770.01

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

07.34.03.0771.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 2^{2a-2b+1} \Gamma(2b-2a+1) z^{b+\frac{1}{2}} (z+1)^{a-b-\frac{3}{2}} U_{b-a-\frac{1}{2}}\left(\frac{z-1}{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.0772.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 4^{a-b} \Gamma(2b-2a+1) z^b (z+1)^{a-b-1} U_{2b-2a}\left(\sqrt{\frac{z}{z+1}}\right) /; z \notin (-1, 0)$$

07.34.03.0773.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = -2^{2(a-b)} \Gamma(2b-2a+1) \, z^b (z+1)^{a-b-\frac{1}{2}} \sin\left((2a-2b-1)\cot^{-1}\left(\sqrt{z}\right)\right)$$

07.34.03.0774.01

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

07.34.03.0775.01

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

07.34.03.0776.01

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

07.34.03.0777.01

$$G_{2,2}^{2,1}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, 4a-3b-1 \end{matrix}\right) = \frac{2\, 3^{3a-3b-1} \Gamma(3a-3b) \Gamma(b-a+1)}{\sqrt{\pi}} z^{4a-3b-1}$$

$$(3z+4)^{-3a+3b-1} (9z+8) \, {}_2F_1\left(a-b+\frac{1}{3}, a-b+\frac{2}{3}; \frac{3}{2}; \frac{(9z+8)^2}{(3z+4)^3}\right) /; |z| > 1 \lor \operatorname{Re}(z) \geq 0$$

07.34.03.0778.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,a+\frac{1}{2}\\ b,\,3b-2a+\frac{1}{2}\end{array}\right.\right)=\frac{2\,3^{3b-3a+\frac{1}{2}}\,\Gamma(b-a+1)\,\Gamma\left(3b-3a+\frac{3}{2}\right)}{\sqrt{\pi}}$$
$$z^{3b-2a+\frac{1}{2}}\,(3z-1)^{3a-3b-\frac{5}{2}}\,(9z+1)\,{}_2F_1\left(b-a+\frac{5}{6},\,b-a+\frac{7}{6};\,\frac{3}{2};\,\frac{(9z+1)^2}{(1-3z)^3}\right)\,/;\,|z|>1\lor\operatorname{Re}(z)>0$$

07.34.03.0779.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,a+1\\ b,\,a\end{array}\right.\right)=\Gamma(b-a)\,z^{\frac{a+b-1}{2}}\,(z+1)^{\frac{a-b-1}{2}}\,U_{b-a-1}\left(\frac{2z+1}{2\sqrt{z}\,\sqrt{z+1}}\right)\,/;\,z\notin(-1,0)$$

07.34.03.0780.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,a+1\\ b,\,a\end{array}\right.\right)=\Gamma(b-a)\,z^{\frac{a+b}{2}-1}\,(z+1)^{\frac{a-b}{2}-1}\,(2z+1)\,U_{\frac{b-a}{2}-1}\left(\frac{2z^2+2z+1}{2z^2+2z}\right)\,/;\,z\notin(-1,0)$$

07.34.03.0781.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,2b-a+1\\ b,\,b+\frac{1}{2}\end{array}\right.\right)=\frac{\sqrt{\pi}}{\sqrt{z+1}}\,z^b\left(\sqrt{z}+\sqrt{z+1}\right)^{2a-2b-1}\,/;\,z\notin(-1,0)$$

07.34.03.0782.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,2b-a+1\\ b,\,b+\frac{1}{2}\end{array}\right.\right)=\frac{\sqrt{\pi}}{\sqrt{z+1}}\,z^b\left(\sqrt{z+1}-\sqrt{z}\right)^{2b-2a+1}\,/;\,z\notin(-1,0)$$

07.34.03.0783.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,2b-a+2\\ b,\,b+\frac{1}{2}\end{array}\right.\right)=\frac{\sqrt{\pi}}{b-a+1}\,z^b\,\left(\sqrt{z+1}+\sqrt{z}\right)^{2a-2b-2}\,/;\,z\notin(-1,0)$$

07.34.03.0784.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,2b-a+2\\ b,\,b+\frac{1}{2}\end{array}\right.\right)=\frac{\sqrt{\pi}}{b-a+1}\,z^b\left(\sqrt{z+1}-\sqrt{z}\right)^{2b-2a+2}\,/;\,z\notin(-1,0)$$

07.34.03.0785.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,4b-3a+3\\ b,\,3b-2a+\frac{3}{2}\end{array}\right.\right)=$$
$$\frac{2^{6b-6a+5}\,\Gamma(b-a+1)\,\Gamma\left(3b-3a+\frac{5}{2}\right)}{\Gamma(4b-4a+4)}\,z^{3b-2a+\frac{3}{2}}\,(4z+1)^{3a-3b-\frac{5}{2}}\,{}_2F_1\left(b-a+\frac{5}{6},\,b-a+\frac{7}{6};\,2b-2a+\frac{5}{2};\,\frac{27z}{(4z+1)^3}\right)$$

07.34.03.0786.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,a\\ a-\frac{3}{2},\,a-\frac{1}{2}\end{array}\right.\right)=-4\,z^{a-1}\,E\left(-\frac{1}{z}\right)$$

07.34.03.0787.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,a\\ a-\frac{3}{2},\,a-\frac{1}{2}\end{array}\right.\right)=-4\,z^{a-\frac{3}{2}}\,\sqrt{z+1}\,E\left(\frac{1}{z+1}\right)\,/;\,z\notin(-1,0)$$

07.34.03.0788.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,\,a\\ a-\frac{3}{4},\,a-\frac{3}{4}\end{array}\right.\right)=\frac{2\,\Gamma\left(\frac{1}{4}\right)^2}{\pi\sqrt{\sqrt{z+1}-1}}\,z^{a-\frac{3}{4}}\,K\left(-\frac{2\left(\sqrt{z+1}+1\right)}{z}\right)\,/;\,z\notin(-1,0)$$

07.34.03.0789.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{3}{4} \end{array} \right.\right) = \frac{2\,\Gamma\left(\frac{1}{4}\right)^2}{\pi} z^{a-\frac{5}{4}} K\left(\frac{2\left(\sqrt{z+1}-1\right)}{z}\right) \sqrt{\sqrt{z+1}-1} \;/;\; z \notin (-1, 0)$$

07.34.03.0790.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{3}{4} \end{array} \right.\right) = \frac{2\,\Gamma\left(\frac{1}{4}\right)^2}{\pi \sqrt{\sqrt{z+1}-1}} z^{a-\frac{3}{4}} K\left(\frac{2}{1-\sqrt{z+1}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0791.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{3}{4} \end{array} \right.\right) = \frac{2\,\Gamma\left(\frac{1}{4}\right)^2}{\pi} z^{a-1} K\left(\frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0792.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{3}{4} \end{array} \right.\right) = \frac{2\sqrt{2}\,\Gamma\left(\frac{1}{4}\right)^2}{\pi \sqrt{\sqrt{z}+\sqrt{z+1}}} z^{a-\frac{3}{4}} K\left(\frac{\sqrt{z+1}-\sqrt{z}}{\sqrt{z+1}+\sqrt{z}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0793.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array} \right.\right) = 2\sqrt{2}\, z^{a-\frac{3}{4}} \frac{1}{\sqrt[4]{z+1}} K\left(\frac{\sqrt{z+1}-\sqrt{z}}{2\sqrt{z+1}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0794.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array} \right.\right) = \frac{2\sqrt{2}}{\sqrt[4]{z+1}} z^{a-\frac{3}{4}} K\left(\frac{1}{2\left(\sqrt{z}+\sqrt{z+1}\right)\sqrt{z+1}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0795.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array} \right.\right) = \frac{4}{\sqrt{\sqrt{z}+\sqrt{z+1}}} z^{a-\frac{3}{4}} K\left(\frac{\sqrt{z}-\sqrt{z+1}}{\sqrt{z}+\sqrt{z+1}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0796.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array} \right.\right) = \frac{2\sqrt{2}}{\sqrt[4]{z+1}} z^{a-\frac{3}{4}} K\left(\frac{\sqrt{z+1}-\sqrt{z}}{2\sqrt{z+1}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0797.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a-\frac{1}{4} \end{array} \right.\right) = \frac{4}{\sqrt{\sqrt{z}+\sqrt{z+1}}} z^{a-\frac{3}{4}} K\left(\frac{\sqrt{z}-\sqrt{z+1}}{\sqrt{z}+\sqrt{z+1}}\right) /;\; z \notin (-1, 0)$$

07.34.03.0798.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a+\frac{1}{4} \end{array} \right.\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2}{2\pi\sqrt{z+1}\sqrt{\sqrt{z+1}-1}} z^{a-\frac{1}{4}} E\left(\frac{2}{\sqrt{z+1}+1}\right) /;\; z \notin (-1, 0)$$

07.34.03.0799.01

$$G_{2,2}^{2,1}\left(z \left| \begin{array}{c} a, a \\ a-\frac{3}{4}, a+\frac{1}{4} \end{array} \right.\right) = \frac{\Gamma\left(\frac{1}{4}\right)^2 \sqrt{1+\sqrt{1+z}}}{2\pi\sqrt{z+1}} z^{a-\frac{3}{4}} E\left(\frac{2}{\sqrt{z+1}+1}\right) /;\; z \notin (-1, 0)$$

07.34.03.0800.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a+\frac{1}{4}\end{array}\right.\right)=\frac{\Gamma\left(\frac{1}{4}\right)^2}{2\pi\sqrt{z+1}\sqrt{\sqrt{z+1}-1}}z^{a-\frac{1}{4}}E\left(\frac{2\left(\sqrt{z+1}-1\right)}{z}\right)/;z\notin(-1,0)$$

07.34.03.0801.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a+\frac{1}{4}\end{array}\right.\right)=\frac{\Gamma\left(\frac{1}{4}\right)^2}{2\pi\sqrt{z+1}}z^{a-\frac{3}{4}}\sqrt{\sqrt{z+1}+1}\,E\left(\frac{2\left(\sqrt{z+1}-1\right)}{z}\right)/;z\notin(-1,0)$$

07.34.03.0802.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a+\frac{1}{4}\end{array}\right.\right)=\frac{\Gamma\left(\frac{1}{4}\right)^2}{2\pi\sqrt{z+1}}z^{a-\frac{3}{4}}\sqrt{\sqrt{z+1}-1}\,E\left(\frac{2}{1-\sqrt{z+1}}\right)/;z\notin(-1,0)$$

07.34.03.0803.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a+\frac{1}{4}\end{array}\right.\right)=\frac{\Gamma\left(\frac{1}{4}\right)^2}{2\pi\sqrt{z+1}\sqrt{\sqrt{z+1}+1}}z^{a-\frac{1}{4}}E\left(\frac{2}{1-\sqrt{z+1}}\right)/;z\notin(-1,0)$$

07.34.03.0804.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{3}{4},a+\frac{1}{4}\end{array}\right.\right)=\frac{\Gamma\left(\frac{1}{4}\right)^2}{2\pi\sqrt{z+1}}z^{a-\frac{3}{4}}\sqrt{\sqrt{z+1}-1}\,E\left(\frac{2}{1-\sqrt{z+1}}\right)/;z\notin(-1,0)$$

07.34.03.0805.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=2z^{a-1}K\left(-\frac{1}{z}\right)$$

07.34.03.0806.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2z^{a-\frac{1}{2}}}{\sqrt{z+1}}K\left(\frac{1}{z+1}\right)/;z\notin(-1,0)$$

07.34.03.0807.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=2z^{a-\frac{3}{2}}\left(\sqrt{z+1}-1\right)K\left(\frac{4\sqrt{z+1}}{\left(\sqrt{z+1}+1\right)^2}\right)/;\operatorname{Re}(z)\geq 0$$

07.34.03.0808.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=\frac{2}{\sqrt[4]{z+1}}z^{a-\frac{3}{4}}K\left(-\frac{\left(\sqrt{z+1}-\sqrt{z}\right)^2}{4\sqrt{z}\sqrt{z+1}}\right)/;z\notin(-1,0)$$

07.34.03.0809.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=2z^{a-\frac{3}{2}}\left(\sqrt{z+1}+1\right)K\left(-\frac{4\sqrt{z+1}}{\left(1-\sqrt{z+1}\right)^2}\right)/;\operatorname{Re}(z)\geq 0$$

07.34.03.0810.01

$$G_{2,2}^{2,1}\left(z\left|\begin{array}{c}a,a\\a-\frac{1}{2},a-\frac{1}{2}\end{array}\right.\right)=4z^{a-\frac{1}{2}}\left(\sqrt{z+1}-\sqrt{z}\right)K\left(\left(\sqrt{z}-\sqrt{z+1}\right)^4\right)/;z\notin(-1,0)$$

07.34.03.0811.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2}\end{matrix}\right) = \frac{4}{\sqrt{z}+\sqrt{z+1}}\, z^{a-\frac{1}{2}}\, K\left(\left(\sqrt{z}-\sqrt{z+1}\right)^4\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0812.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2}\end{matrix}\right) = 4\, z^{a-\frac{1}{2}} \left(\sqrt{z+1}-\sqrt{z}\right) K\left(\frac{1}{\left(\sqrt{z}+\sqrt{z+1}\right)^4}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0813.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2}\end{matrix}\right) = \frac{4}{\sqrt{z}+\sqrt{z+1}}\, z^{a-\frac{1}{2}}\, K\left(\frac{1}{\left(\sqrt{z}+\sqrt{z+1}\right)^4}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0814.01

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

07.34.03.0815.01

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

07.34.03.0816.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{4},\, a-\frac{1}{4}\end{matrix}\right) = \frac{2\,\Gamma\left(\frac{3}{4}\right)^2}{\pi\sqrt{z+1}}\, z^{a-\frac{3}{4}} \sqrt{\sqrt{z+1}-1}\; K\left(\frac{2\left(\sqrt{z+1}-1\right)}{z}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0817.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{4},\, a-\frac{1}{4}\end{matrix}\right) = \frac{2\,\Gamma\left(\frac{3}{4}\right)^2}{\pi\sqrt{z+1}\,\sqrt{\sqrt{z+1}-1}}\, z^{a-\frac{1}{4}}\, K\left(-\frac{2\left(\sqrt{z+1}+1\right)}{z}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0818.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{4},\, a-\frac{1}{4}\end{matrix}\right) = \frac{2\,\Gamma\left(\frac{3}{4}\right)^2}{\pi\sqrt{z+1}}\, z^{a-\frac{1}{2}}\, K\left(\frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0819.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{4},\, a-\frac{1}{4}\end{matrix}\right) = \frac{2\,\Gamma\left(\frac{3}{4}\right)^2}{\pi\sqrt{z+1}\,\sqrt{\sqrt{z+1}-1}}\, z^{a-\frac{1}{4}}\, K\left(\frac{2}{1-\sqrt{z+1}}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0820.01

$$G_{2,2}^{2,1}\left(z\,\middle|\,\begin{matrix} a,\, a \\ a-\frac{1}{4},\, a-\frac{1}{4}\end{matrix}\right) = \frac{2\sqrt{2}\,\Gamma\left(\frac{3}{4}\right)^2}{\pi\sqrt{z+1}\,\sqrt{\sqrt{z}+\sqrt{z+1}}}\, z^{a-\frac{1}{4}}\, K\left(\frac{\sqrt{z+1}-\sqrt{z}}{\sqrt{z+1}+\sqrt{z}}\right) /;\, z \notin (-1,\, 0)$$

07.34.03.0821.01

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

07.34.03.0822.01

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

07.34.03.0823.01

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

07.34.03.0824.01

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

07.34.03.0825.01

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

07.34.03.0826.01

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

07.34.03.0827.01

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

07.34.03.0828.01

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

07.34.03.0829.01

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

07.34.03.0830.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a+1 \\ a, a \end{matrix}\right) = z^{a} \log\left(1+\frac{1}{z}\right)$$

07.34.03.1103.01

$$G_{2,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c \\ a, b \end{matrix}\right) = \Gamma(b-c+1)\,(-z-1)^{-b+c-1}\,(-z)^{-a+b+1}\, z^{a-1}\, I_{-\frac{1}{z}}(c-a, b-c+1) /; z \notin (0, \infty)$$

Case $\{m, n, p, q\} = \{2, 1, 2, 3\}$

07.34.03.0831.01

$$G_{2,3}^{2,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi \csc(\pi (b_2-b_1)) \left(\frac{\Gamma(1-a_1+b_1)}{\Gamma(a_2-b_1)} z^{b_1}\, {}_2\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1, b_1-b_3+1; -z) - \frac{\Gamma(1-a_1+b_2)}{\Gamma(a_2-b_2)} z^{b_2}\, {}_2\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2; 1-b_1+b_2, b_2-b_3+1; -z)\right) /; b_2-b_1 \notin \mathbb{Z}$$

07.34.03.0832.01

$$G_{2,3}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ a,\, a,\, a+\frac{1}{2} \end{matrix}\right) = -\frac{z^a}{\pi} e^{-z} \operatorname{Ei}(z) /;\, z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{2, 1, 2, 4\}$

07.34.03.0833.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2 \\ b_1,\, b_2,\, b_3,\, b_4 \end{matrix}\right) = \pi \csc(\pi (b_2 - b_1)) \left(\frac{\Gamma(b_1 - a_1 + 1)}{\Gamma(a_2 - b_1)} z^{b_1} \, {}_2\tilde{F}_3(b_1 - a_1 + 1, b_1 - a_2 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; -z) - \frac{\Gamma(b_2 - a_1 + 1)}{\Gamma(a_2 - b_2)} z^{b_2} \, {}_2\tilde{F}_3(b_2 - a_1 + 1, b_2 - a_2 + 1; b_2 - b_1 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1; -z)\right)$$

07.34.03.0834.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2} \\ b,\, 2a-b-1,\, c,\, 2a-c-1 \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((a-b)\pi)}{2} z^{a-\frac{1}{2}} \left(J_{2a-b-c-1}\left(\sqrt{z}\right) J_{c-b}\left(\sqrt{z}\right) + J_{b-c}\left(\sqrt{z}\right) J_{b+c-2a+1}\left(\sqrt{z}\right)\right)$$

07.34.03.0835.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, c,\, 2a-c \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((b-a)\pi)}{2} z^{a} \left(J_{2a-b-c}\left(\sqrt{z}\right) J_{c-b}\left(\sqrt{z}\right) - J_{b-c}\left(\sqrt{z}\right) J_{b+c-2a}\left(\sqrt{z}\right)\right)$$

07.34.03.0836.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, b-\frac{1}{2} \\ b,\, a-\frac{1}{2},\, 2a-b-1,\, b-\frac{1}{2} \end{matrix}\right) = \sqrt{\pi}\, z^{a-\frac{1}{2}} J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right) Y_{a-b-\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0837.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2} \\ b,\, a,\, 2a-b-1,\, a-1 \end{matrix}\right) = \sqrt{\pi}\, z^{a-\frac{1}{2}} J_{b-a+1}\left(\sqrt{z}\right) Y_{b-a}\left(\sqrt{z}\right)$$

07.34.03.0838.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2} \\ b,\, 2a-b-1,\, 2a-b-\frac{3}{2},\, b+\frac{1}{2} \end{matrix}\right) = \frac{\csc((a-b)\pi)}{\sqrt{2}} z^{a-\frac{3}{4}} \left(\cos\left(\sqrt{z}\right) J_{2b-2a+\frac{3}{2}}\left(\sqrt{z}\right) + \sin\left(\sqrt{z}\right) J_{2a-2b-\frac{3}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.0839.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a-\frac{1}{2} \\ b,\, 2a-b-1,\, a-\frac{1}{2},\, a-\frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi}\, \csc((a-b)\pi)}{2} z^{a-\frac{1}{2}} \left(J_{a-b-\frac{1}{2}}\left(\sqrt{z}\right)^2 + J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)^2\right)$$

07.34.03.0840.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, 2a-b-\frac{1}{2},\, b+\frac{1}{2} \end{matrix}\right) = \frac{\csc((a-b)\pi)}{\sqrt{2}} z^{a-\frac{1}{4}} \left(\cos\left(\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) - \sin\left(\sqrt{z}\right) J_{2a-2b-\frac{1}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.0841.01

$$G_{2,4}^{2,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, a+1,\, 2a-b,\, a-1 \end{matrix}\right) = \sqrt{\pi}\, z^{a} J_{b-a+1}\left(\sqrt{z}\right) Y_{b-a-1}\left(\sqrt{z}\right)$$

07.34.03.0842.01

$$G_{2,4}^{2,1}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2} \\ a,\, a,\, a+\frac{1}{2},\, a-\frac{1}{2} \end{array}\right) = 2\,\pi^{-3/2}\, z^{a-\frac{1}{2}} \left(\cos\left(2\sqrt{z}\right) \operatorname{Si}\left(2\sqrt{z}\right) - \sin\left(2\sqrt{z}\right) \operatorname{Ci}\left(2\sqrt{z}\right)\right)$$

07.34.03.0843.01

$$G_{2,4}^{2,1}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2} \\ a,\, a,\, a+\frac{1}{2},\, a+\frac{1}{2} \end{array}\right) = -2\,\pi^{-3/2}\, z^{a} \left(\cos\left(2\sqrt{z}\right) \operatorname{Ci}\left(2\sqrt{z}\right) + \sin\left(2\sqrt{z}\right) \operatorname{Si}\left(2\sqrt{z}\right)\right)$$

Case $\{m, n, p, q\} = \{2, 1, 3, 2\}$

07.34.03.0844.01

$$G_{3,2}^{2,1}\left(z \middle| \begin{array}{c} a_1,\, a_2,\, a_3 \\ b_1,\, b_2 \end{array}\right) = \Gamma(1-a_1+b_1)\,\Gamma(1-a_1+b_2)\, z^{a_1-1}\, {}_2\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2;\, 1-a_1+a_2,\, 1-a_1+a_3;\, -\frac{1}{z}\right)$$

07.34.03.0845.01

$$G_{3,2}^{2,1}\left(z \middle| \begin{array}{c} a,\, c,\, d \\ b,\, d+1 \end{array}\right) = \frac{(d-a+1)\, z^{a-1}\, \Gamma(b-a+1)}{\Gamma(c-a+1)} \left({}_1F_1\left(b-a+1;\, c-a+1;\, -\frac{1}{z}\right) + \frac{b-a+1}{(c-a+1)\,(a-d-1)\, z}\, {}_1F_1\left(b-a+2;\, c-a+2;\, -\frac{1}{z}\right)\right) /;\, z \notin (-\infty,\, 0)$$

07.34.03.0846.01

$$G_{3,2}^{2,1}\left(z \middle| \begin{array}{c} a,\, c,\, b+1 \\ b,\, c-1 \end{array}\right) = \frac{z^{a-1}}{(b-a+1)\,(c-a)\,(b-c+1)} \left((a-b-1)\,(c-a)\left(\frac{1}{z}\right)^{a-b-1} \left(\Gamma(b-a+1) - \Gamma\left(b-a+1,\, \frac{1}{z}\right)\right) + (a-b-1)\,(a-c)\left(\frac{1}{z}\right)^{a-c} \left(\Gamma(c-a) - \Gamma\left(c-a,\, \frac{1}{z}\right)\right)\right) /;\, z \notin (-\infty,\, 0)$$

07.34.03.0847.01

$$G_{3,2}^{2,1}\left(z \middle| \begin{array}{c} a,\, c,\, a+1 \\ b,\, a \end{array}\right) = \frac{z^a\, \Gamma(b-a)}{\Gamma(c-a)} \left(1 - {}_1F_1\left(b-a;\, c-a;\, -\frac{1}{z}\right)\right)$$

07.34.03.0848.01

$$G_{3,2}^{2,1}\left(z \middle| \begin{array}{c} a,\, a+1,\, a+1 \\ a,\, a \end{array}\right) = z^a \left(\Gamma\left(0,\, \frac{1}{z}\right) - \log(z) + \gamma\right)$$

07.34.03.0849.01

$$G_{3,2}^{2,1}\left(z \middle| \begin{array}{c} a,\, a+1,\, a+1 \\ a,\, a \end{array}\right) = \frac{1}{2}\, z^a \left(-2\operatorname{Ei}\left(-\frac{1}{z}\right) + \log\left(-\frac{1}{z}\right) - \log(-z) + 2\,\gamma\right) /;\, z \notin (-\infty,\, 0)$$

Case $\{m, n, p, q\} = \{2, 1, 3, 3\}$

07.34.03.0850.01

$$G_{3,3}^{2,1}\left(z \left| \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{array} \right.\right) = \frac{\Gamma(1-a_1+b_1)\,\Gamma(1-a_1+b_2)}{\Gamma(a_1-b_3)}\, z^{a_1-1}$$
$$ {}_3\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2,\, 1-a_1+b_3;\, 1-a_1+a_2,\, 1-a_1+a_3;\, \frac{1}{z}\right)\theta(|z|-1) + \pi\csc(\pi\,(b_2-b_1))$$
$$\left(\frac{\Gamma(1-a_1+b_1)}{\Gamma(a_2-b_1)\,\Gamma(a_3-b_1)}\, z^{b_1}\, {}_3\tilde{F}_2(1-a_1+b_1,\, 1-a_2+b_1,\, 1-a_3+b_1;\, b_1-b_2+1,\, b_1-b_3+1;\, z) - \frac{\Gamma(1-a_1+b_2)}{\Gamma(a_2-b_2)\,\Gamma(a_3-b_2)}\right.$$
$$\left. z^{b_2}\, {}_3\tilde{F}_2(1-a_1+b_2,\, 1-a_2+b_2,\, 1-a_3+b_2;\, 1-b_1+b_2,\, b_2-b_3+1;\, z)\right)\theta(1-|z|)\; /;\; b_2-b_1 \notin \mathbb{Z}$$

07.34.03.0851.01

$$G_{3,3}^{2,1}\left(z \left| \begin{array}{c} a,\, a+\frac{1}{2},\, a+1 \\ a,\, a,\, a+\frac{1}{2} \end{array} \right.\right) = \frac{z^a}{\pi}\left(\log\left(1-\frac{1}{z}\right)\theta(|z|-1) + \log\left(\frac{1}{z}-1\right)\theta(1-|z|)\right) /;\; z \notin (-\infty,\, 0)$$

Case $\{m, n, p, q\} = \{2, 1, 4, 2\}$

07.34.03.0852.01

$$G_{4,2}^{2,1}\left(z \left| \begin{array}{c} a_1, a_2, a_3, a_4 \\ b_1, b_2 \end{array} \right.\right) =$$
$$z^{a_1-1}\,\Gamma(b_1-a_1+1)\,\Gamma(b_2-a_1+1)\, {}_2\tilde{F}_3\left(b_1-a_1+1,\, b_2-a_1+1;\, a_2-a_1+1,\, a_3-a_1+1,\, a_4-a_1+1;\, -\frac{1}{z}\right)$$

07.34.03.0853.01

$$G_{4,2}^{2,1}\left(z \left| \begin{array}{c} a,\, c,\, c+\frac{1}{2},\, a-\frac{1}{2} \\ b,\, b+\frac{1}{2} \end{array} \right.\right) =$$
$$\frac{2^{2c-2b-1}\,\Gamma(2b-2a+2)}{\sqrt{\pi}}\, z^{a-1}\left({}_1\tilde{F}_1\left(2b-2a+2;\, 2c-2a+2;\, \frac{2}{\sqrt{-z}}\right) + {}_1\tilde{F}_1\left(2b-2a+2;\, 2c-2a+2;\, -\frac{2}{\sqrt{-z}}\right)\right)$$

07.34.03.0854.01

$$G_{4,2}^{2,1}\left(z \left| \begin{array}{c} a,\, c,\, c+\frac{1}{2},\, a+\frac{1}{2} \\ b,\, b+\frac{1}{2} \end{array} \right.\right) =$$
$$\frac{2^{2c-2b-1}\,\Gamma(2b-2a+1)\, z^a}{\sqrt{\pi}\,\sqrt{-z}}\left({}_1\tilde{F}_1\left(2b-2a+1;\, 2c-2a+1;\, -\frac{2}{\sqrt{-z}}\right) - {}_1\tilde{F}_1\left(2b-2a+1;\, 2c-2a+1;\, \frac{2}{\sqrt{-z}}\right)\right)$$

07.34.03.0855.01

$$G_{4,2}^{2,1}\left(z \left| \begin{array}{c} a,\, c,\, c+\frac{1}{2},\, 2c-a+1 \\ b,\, 2c-b \end{array} \right.\right) =$$
$$\frac{2^{2c-2a+1}\,\Gamma(b-a+1)\,\Gamma(2c-a-b+1)}{\sqrt{\pi}\,\Gamma(2c-2a+2)^2}\, z^{a-1}\, {}_1F_1\left(b-a+1;\, 2c-2a+2;\, -\frac{2}{\sqrt{-z}}\right) {}_1F_1\left(b-a+1;\, 2c-2a+2;\, \frac{2}{\sqrt{-z}}\right)$$

07.34.03.0856.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c, c+\frac{1}{2}, 2c-a+1 \\ b, 2c-b \end{matrix}\right) = \frac{2^{2c-2a+1}\,\Gamma(b-a+1)\,\Gamma(2c-a-b+1)}{\sqrt{\pi}\,\Gamma(2c-2a+2)^2} z^{a-1}\,{}_1F_1\left(b-a+1; 2c-2a+2; -\frac{2\,i}{\sqrt{z}}\right){}_1F_1\left(b-a+1; 2c-2a+2; \frac{2\,i}{\sqrt{z}}\right)$$

07.34.03.0857.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c, 2b-a+1, 2b-c+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \sqrt{\pi}\, z^{b-\frac{1}{2}} J_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) J_{c-a}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0858.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c, 2b-a+1, 2b-c+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}}{\Gamma(2b-a-c+2)\,\Gamma(c-a+1)} z^{a-1}\,{}_1F_1\left(2b-a-c+\frac{3}{2}; 4b-2a-2c+3; \frac{2}{\sqrt{-z}}\right){}_1F_1\left(c-a+\frac{1}{2}; 2c-2a+1; -\frac{2}{\sqrt{-z}}\right)$$

07.34.03.0859.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c, 2b-a+1, 2b-c+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \frac{2^{2a-2b-1}\sqrt{\pi}\, z^{a-1}}{\Gamma(2b-a-c+2)\,\Gamma(c-a+1)}\,{}_0F_1\left(; 2b-a-c+2; -\frac{1}{4z}\right){}_0F_1\left(; c-a+1; -\frac{1}{4z}\right)$$

07.34.03.0860.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, c, 2b-a+1, 2b-c+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = 2^{2a-2b-1}\sqrt{\pi}\, z^{a-1}\,{}_0\tilde{F}_1\left(; 2b-a-c+2; -\frac{1}{4z}\right){}_0\tilde{F}_1\left(; c-a+1; -\frac{1}{4z}\right)$$

07.34.03.0861.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2}, 2b-a+1, 2b-a+\frac{3}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = \sqrt{2}\, z^{b-\frac{1}{4}} \cos\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0862.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{2}, 2b-a+1, 2b-a+\frac{3}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = 2^{2a-2b-1} z^{a-1} \cos\left(\frac{1}{\sqrt{z}}\right){}_0\tilde{F}_1\left(; 2b-2a+\frac{5}{2}; -\frac{1}{4z}\right)$$

07.34.03.0863.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+\frac{1}{2}, 2b-a+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \sqrt{2}\, z^{b-\frac{1}{4}} \sin\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0864.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+\frac{1}{2}, 2b-a+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \frac{4^{a-b}}{\Gamma\left(2b-2a+\frac{3}{2}\right)} z^{a-\frac{1}{2}} \sin\left(\frac{1}{\sqrt{z}}\right){}_0F_1\left(; 2b-2a+\frac{3}{2}; -\frac{1}{4z}\right)$$

07.34.03.0865.01

$$G_{4,2}^{2,1}\left(z \,\middle|\, \begin{matrix} a, a-\frac{1}{4}, a+\frac{1}{4}, a+\frac{1}{2} \\ a-\frac{1}{2}, a \end{matrix}\right) = \sqrt{2}\, z^{a-\frac{1}{2}}\left(C\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)^2 + S\left(\frac{2}{\sqrt{\pi}\,\sqrt[4]{z}}\right)^2\right)$$

Case $\{m, n, p, q\} = \{2, 1, 5, 3\}$

07.34.03.0866.01

$$G_{5,3}^{2,1}\left(z \middle| \begin{array}{c} a_1, a_2, a_3, a_4, a_5 \\ b_1, b_2, b_3 \end{array}\right) = \frac{z^{a_1-1}\,\Gamma(b_1-a_1+1)\,\Gamma(b_2-a_1+1)}{\Gamma(a_1-b_3)}$$

$$\,_3\tilde{F}_4\left(b_1-a_1+1, b_2-a_1+1, b_3-a_1+1; a_2-a_1+1, a_3-a_1+1, a_4-a_1+1, a_5-a_1+1; \frac{1}{z}\right)$$

07.34.03.0867.01

$$G_{5,3}^{2,1}\left(z \middle| \begin{array}{c} a, c, b+\frac{1}{4}, 2b-a+1, 2b-c+1 \\ b, b+\frac{1}{2}, b+\frac{1}{4} \end{array}\right) = \frac{\sin\left(\left(a-b-\frac{1}{4}\right)\pi\right)}{\sqrt{\pi}} z^{b-\frac{1}{2}} I_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) I_{c-a}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0868.01

$$G_{5,3}^{2,1}\left(z \middle| \begin{array}{c} a, a-\frac{1}{2}, b+\frac{3}{4}, 2b-a+1, 2b-a+\frac{3}{2} \\ b, b+\frac{1}{2}, b+\frac{3}{4} \end{array}\right) = \frac{\sqrt{2}}{\pi} \cos\left(\left(-a+b+\frac{5}{4}\right)\pi\right) z^{b-\frac{1}{4}} \cosh\left(\frac{1}{\sqrt{z}}\right) I_{2b-2a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0869.01

$$G_{5,3}^{2,1}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2}, b+\frac{3}{4}, 2b-a+\frac{1}{2}, 2b-a+1 \\ b, b+\frac{1}{2}, b+\frac{3}{4} \end{array}\right) = \frac{\sqrt{2}}{\pi} \sin\left(\left(a-b-\frac{3}{4}\right)\pi\right) z^{b-\frac{1}{4}} \sinh\left(\frac{1}{\sqrt{z}}\right) I_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0870.01

$$G_{5,3}^{2,1}\left(z \middle| \begin{array}{c} a, a-\frac{1}{4}, a+\frac{1}{4}, a+\frac{1}{2}, a+\frac{1}{2} \\ a-\frac{1}{2}, a, a+\frac{1}{2} \end{array}\right) = -\frac{1}{\sqrt{2}\,\pi} z^{a-\frac{1}{2}} \operatorname{erf}\left(\frac{\sqrt{2}}{\sqrt[4]{z}}\right) \operatorname{erfi}\left(\frac{\sqrt{2}}{\sqrt[4]{z}}\right)$$

Case $\{m, n, p, q\} = \{2, 2, 2, 2\}$

07.34.03.0871.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2 \end{array}\right) =$$

$$\Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\,\Gamma(1-a_2+b_2)\,\Gamma(1-a_1+b_2)\, z^{b_1} \,_2\tilde{F}_1(1-a_1+b_1, 1-a_2+b_1; 2-a_1-a_2+b_1+b_2; 1-z)$$

07.34.03.0872.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2 \end{array}\right) = \pi \csc(\pi(b_2-b_1)) \big(\Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\, z^{b_1} \,_2\tilde{F}_1(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1; z) -$$

$$\Gamma(1-a_1+b_2)\,\Gamma(1-a_2+b_2)\, z^{b_2} \,_2\tilde{F}_1(1-a_1+b_2, 1-a_2+b_2; 1-b_1+b_2; z)\big)$$

07.34.03.0873.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2 \end{array}\right) = z^{a_1-1}\,\Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\,\Gamma(1-a_1+b_2)$$

$$\Gamma(1-a_2+b_2) \,_2\tilde{F}_1\left(1-a_1+b_1, 1-a_1+b_2; 2-a_1-a_2+b_1+b_2; 1-\frac{1}{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0874.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{array}{c} a, c \\ b, d \end{array}\right) = \Gamma(a-b)\,\Gamma(b-a+1)\,\Gamma(b-c+1)\,\Gamma(d-a+1)\, z^b\, P_{a-b-1}^{(-a+b-c+d+1, b-d)}(2z-1)$$

07.34.03.0875.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{array}{c} a, c \\ b, d \end{array}\right) = \Gamma(a-b)\,\Gamma(b-a+1)\,\Gamma(b-c+1)\,\Gamma(d-a+1)\, z^{a-1}\, P_{a-b-1}^{(-a+b-c+d+1, c-a)}\left(\frac{2}{z}-1\right) /; z \notin (-\infty, 0)$$

07.34.03.0876.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, c \\ b, a+b-c \end{array} \right.\right) = \frac{\pi^{3/2} \csc((c-b)\pi)\, \Gamma(b-a+1)\, \Gamma(a+b-2c+1)}{\Gamma(c-b)}\, z^{b+\frac{1}{4}(2a-2c-1)}\, ((z-1)\operatorname{sgn}(|z|-1))^{c-b-\frac{1}{2}}\, \mathbb{P}_{a-c-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\frac{z+1}{2\sqrt{z}}\right)$$

07.34.03.0877.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, c \\ b, b-a+c \end{array} \right.\right) = 2\, e^{i(c-a)\pi}\, \Gamma(b-a+1)\, \Gamma(b+c-2a+1)\, z^{b+\frac{c-a}{2}}\, ((z-1)\operatorname{sgn}(|z|-1))^{a-b-1}\, \mathbb{Q}_{b-a}^{a-c}\left(\frac{z+1}{(z-1)\operatorname{sgn}(|z|-1)}\right) /;\, z \notin (-1, 0)$$

07.34.03.0878.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, b \\ b, a \end{array} \right.\right) = \pi \csc((a-b)\pi)\, \frac{z^a - z^b}{z-1}$$

07.34.03.0879.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, b \\ b, b \end{array} \right.\right) = \Gamma(b-a+1)\, z^b\, \Phi(1-z, 1, b-a+1)$$

07.34.03.0880.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, a \\ b, a \end{array} \right.\right) = \Gamma(b-a+1)\, z^{a-1}\, \Phi\left(1-\frac{1}{z}, 1, b-a+1\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0881.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, a+\frac{1}{4} \\ b, b+\frac{1}{4} \end{array} \right.\right) = \frac{2^{a-b+\frac{1}{2}}\, \pi^2 \csc((a-b)\pi)\, \Gamma\left(2b-2a+\frac{3}{2}\right)}{\Gamma(a-b)\sqrt{\sqrt{z}+1}}\, z^b\, ((z-1)\operatorname{sgn}(|z|-1))^{a-b-\frac{1}{2}}\, P_{a-b-1}^{a-b-\frac{1}{2}}\left(\frac{2\sqrt[4]{z}}{\sqrt{z}+1}\right)$$

07.34.03.0882.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, 2a-b-\frac{1}{2} \\ b, a-\frac{1}{2} \end{array} \right.\right) = \frac{2^{a-b}\, \pi^2 \csc((a-b)\pi)\, \Gamma\left(2b-2a+\frac{3}{2}\right) ((1-z)\operatorname{sgn}(1-|z|))^{a-b-\frac{1}{2}}}{\Gamma(a-b)\sqrt{z+1}}\, z^{\frac{1}{4}(2a+2b-1)}\, P_{-\frac{1}{4}}^{a-b-\frac{1}{2}}\left(-\frac{z^2-6z+1}{(z+1)^2}\right) /;\, z \notin (-\infty, -1)$$

07.34.03.1112.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array} \right.\right) = 2\pi\, z^{a-\frac{1}{2}}\, K(1-z) /;\, z \notin (-\infty, -1)$$

07.34.03.0883.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array} \right.\right) = \frac{4\pi}{\sqrt{z}+1}\, z^{a-\frac{1}{2}}\, K\left(\left(\frac{1-\sqrt{z}}{1+\sqrt{z}}\right)^2\right) /;\, z \notin (-\infty, -1)$$

07.34.03.0884.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array} \right.\right) = 2\pi\, z^{a-\frac{3}{4}}\, K\left(-\frac{\left(\sqrt{z}-1\right)^2}{4\sqrt{z}}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0885.01

$$G_{2,2}^{2,2}\left(z \left| \begin{array}{c} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{array} \right.\right) = 4\pi\, z^{a-\frac{1}{2}}\, F\left(\cot^{-1}\left(\sqrt[4]{z}\right) \middle| 1-z\right) /;\, z \notin (-\infty, -1)$$

07.34.03.0886.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{matrix} a, a \\ a-\frac{1}{2}, a-\frac{1}{2} \end{matrix}\right) = \frac{K(1-z)}{E(1-z)} z^{a-\frac{1}{2}} \left(4\pi E\left(\cot^{-1}\left(\sqrt[4]{z}\right) \middle| 1-z\right) - 2\pi\left(1-\sqrt{z}\right)\right) /; z \notin (-\infty, -1)$$

07.34.03.0887.01

$$G_{2,2}^{2,2}\left(z \middle| \begin{matrix} a, a \\ a, a \end{matrix}\right) = \frac{z^a \log(z)}{z-1} /; z \notin (-\infty, -1)$$

07.34.03.0888.01

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

07.34.03.0889.02

$$G_{2,2}^{2,2}\left(z \middle| \begin{matrix} a, a+1 \\ a-\frac{1}{2}, a+\frac{1}{2} \end{matrix}\right) = z^{a-\frac{1}{2}} \left(2\pi\left(1-\sqrt{z}\right) - 4\pi E\left(\cot^{-1}\left(\sqrt[4]{z}\right) \middle| 1-z\right)\right) /; z \notin (-\infty, -1)$$

07.34.03.1104.01

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

07.34.03.1113.01

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

Case $\{m, n, p, q\} = \{2, 2, 2, 3\}$

07.34.03.0890.01

$$G_{2,3}^{2,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi \csc(\pi(b_2-b_1)) \left(\Gamma(1-a_1+b_1)\Gamma(1-a_2+b_1) z^{b_1} {}_2\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1, b_1-b_3+1; z) - \Gamma(1-a_1+b_2)\Gamma(1-a_2+b_2) z^{b_2} {}_2\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2; 1-b_1+b_2, b_2-b_3+1; z)\right) /; b_2-b_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 2, 2, 4\}$

07.34.03.0891.01

$$G_{2,4}^{2,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) = \pi \csc(\pi(b_2-b_1)) \left(\Gamma(b_1-a_1+1)\Gamma(b_1-a_2+1) z^{b_1} {}_2\tilde{F}_3(b_1-a_1+1, b_1-a_2+1; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1; z) - \Gamma(b_2-a_1+1)\Gamma(b_2-a_2+1) z^{b_2} {}_2\tilde{F}_3(b_2-a_1+1, b_2-a_2+1; b_2-b_1+1, b_2-b_3+1, b_2-b_4+1; z)\right)$$

07.34.03.0892.01

$$G_{2,4}^{2,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, c, 2a-b, 2a-c \end{matrix}\right) = 2\sqrt{\pi}\, z^a I_{b+c-2a}\left(\sqrt{z}\right) K_{b-c}\left(\sqrt{z}\right)$$

07.34.03.0893.01

$$G_{2,4}^{2,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, 2a-b, c, 2a-c \end{matrix}\right) = \pi^{3/2} \csc((2b-2a)\pi) z^a \left(I_{2a-b-c}\left(\sqrt{z}\right) I_{c-b}\left(\sqrt{z}\right) - I_{b-c}\left(\sqrt{z}\right) I_{b+c-2a}\left(\sqrt{z}\right)\right)$$

07.34.03.0894.01

$$G_{2,4}^{2,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b-\frac{1}{2},\, b+\frac{1}{2},\, 2a-b \end{matrix}\right) = 2\sqrt{2}\, z^{a-\frac{1}{4}} \cosh\left(\sqrt{z}\right) K_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0895.01

$$G_{2,4}^{2,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b,\, b+\frac{1}{2},\, 2a-b-\frac{1}{2} \end{matrix}\right) = \sqrt{2}\, \pi\, z^{a-\frac{1}{4}} \csc(2(a-b)\pi) \left(\cosh\left(\sqrt{z}\right) I_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) - \sinh\left(\sqrt{z}\right) I_{2a-2b-\frac{1}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.0896.01

$$G_{2,4}^{2,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ b,\, 2a-b+\frac{1}{2},\, b-\frac{1}{2},\, 2a-b \end{matrix}\right) = 2\sqrt{2}\, z^{a-\frac{1}{4}} \sinh\left(\sqrt{z}\right) K_{2b-2a-\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.1105.01

$$G_{2,4}^{2,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ b,\, b+\frac{2}{3},\, 2a-b-\frac{2}{3},\, 2a-b \end{matrix}\right) = -\frac{2\, 2^{2/3}\, \pi^{3/2}\, z^{a-\frac{1}{3}}}{\sqrt[6]{3}} \operatorname{Ai}'\left(\left(\frac{3}{2}\right)^{2/3} \sqrt[3]{z}\right) I_{-2a+2b+\frac{2}{3}}\left(\sqrt{z}\right)$$

07.34.03.1106.01

$$G_{2,4}^{2,2}\left(z\,\middle|\,\begin{matrix} a,\, a+\frac{1}{2} \\ b,\, b+\frac{1}{3},\, 2a-b-\frac{1}{3},\, 2a-b \end{matrix}\right) = 2\sqrt[3]{2}\,\sqrt[6]{3}\, \pi^{3/2}\, z^{a-\frac{1}{6}} \operatorname{Ai}\left(\left(\frac{3}{2}\right)^{2/3} \sqrt[3]{z}\right) I_{-2a+2b+\frac{1}{3}}\left(\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{2, 2, 3, 2\}$

07.34.03.0897.01

$$G_{3,2}^{2,2}\left(z\,\middle|\,\begin{matrix} a_1,\, a_2,\, a_3 \\ b_1,\, b_2 \end{matrix}\right) =$$

$$\pi \csc(\pi(a_1-a_2)) \left(\Gamma(1-a_1+b_1)\, \Gamma(1-a_1+b_2)\, z^{a_1-1}\, {}_2\tilde{F}_2\left(1-a_1+b_1,\, 1-a_1+b_2;\, 1-a_1+a_2,\, 1-a_1+a_3;\, \frac{1}{z}\right) - \right.$$

$$\left. \Gamma(1-a_2+b_1)\, \Gamma(1-a_2+b_2)\, z^{a_2-1}\, {}_2\tilde{F}_2\left(1-a_2+b_1,\, 1-a_2+b_2;\, a_1-a_2+1,\, 1-a_2+a_3;\, \frac{1}{z}\right)\right) /;\, a_2-a_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 2, 3, 3\}$

07.34.03.0898.01

$$G_{3,3}^{2,2}\left(z\,\middle|\,\begin{matrix} a_1,\, a_2,\, a_3 \\ b_1,\, b_2,\, b_3 \end{matrix}\right) =$$

$$\pi \csc(\pi(b_2-b_1)) \left(\frac{\Gamma(1-a_1+b_1)\, \Gamma(1-a_2+b_1)}{\Gamma(a_3-b_1)} z^{b_1}\, {}_3\tilde{F}_2(1-a_1+b_1,\, 1-a_2+b_1,\, 1-a_3+b_1;\, b_1-b_2+1,\, b_1-b_3+1;\, -z) - \right.$$

$$\frac{\Gamma(-a_1+b_2+1)\, \Gamma(-a_2+b_2+1)}{\Gamma(a_3-b_2)} z^{b_2}$$

$$\left. {}_3\tilde{F}_2(1-a_1+b_2,\, 1-a_2+b_2,\, 1-a_3+b_2;\, 1-b_1+b_2,\, b_2-b_3+1;\, -z)\right) /;\, b_2-b_1 \notin \mathbb{Z}$$

07.34.03.0899.01

$$G_{3,3}^{2,2}\left(z\,\middle|\,\begin{matrix} a,\, c,\, c-\frac{1}{2} \\ b,\, b+\frac{1}{2},\, c-\frac{1}{2} \end{matrix}\right) = \frac{2^{a-2b+c}\, \Gamma(2b-2a+2)}{\sqrt{\pi}} z^b\, (z+1)^{\frac{a+c}{2}-b-1}\, Q_{2b-a-c+1}^{a-c}\left(\sqrt{\frac{z}{z+1}}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0900.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2c-a \\ b, c-\frac{1}{2}, -b+2c-1 \end{array}\right) = \frac{2 e^{i\left(b-c+\frac{1}{2}\right)\pi} \sqrt{\pi}\, \Gamma(b-a+1)}{\Gamma(2c-a-b)} z^{c-\frac{1}{2}} \mathfrak{P}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0901.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2c-a \\ b, c-\frac{1}{2}, 2c-b-1 \end{array}\right) = 2 e^{i\left(c-b-\frac{1}{2}\right)\pi} \sqrt{\pi}\, z^{c-\frac{1}{2}} \mathfrak{P}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{b-c+\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0902.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2a-c \\ b, a-\frac{1}{2}, 2a-b-1 \end{array}\right) = \sqrt{2}\, \pi\, \Gamma(b-c+1)\, z^{a-\frac{3}{4}} \mathfrak{P}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{P}_{a-c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0903.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2a-c \\ b, a-\frac{1}{2}, 2a-b-1 \end{array}\right) = \sqrt{2}\, \pi\, z^{a-\frac{3}{4}} \Gamma(b-c+1)\, \mathfrak{P}_{a-b-1}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{P}_{c-a-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0904.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2a-c \\ b, a-\frac{1}{2}, 2a-b-1 \end{array}\right) = \frac{2 e^{i(a-c)\pi} \sqrt{\pi}\, \Gamma(b-c+1)}{\Gamma(b+c-2a+1)} z^{a-1} \mathfrak{P}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0905.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2a-c \\ b, a-\frac{1}{2}, 2a-b-1 \end{array}\right) = 2 e^{i(c-a)\pi} \sqrt{\pi}\, z^{a-1} \mathfrak{P}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{b-a}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0906.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2a-c \\ b, a-\frac{1}{2}, 2a-b-1 \end{array}\right) = \frac{2\sqrt{2}\, e^{i\left(c-b-\frac{1}{2}\right)\pi}}{\Gamma(b-c+1)} z^{a-\frac{3}{4}} \mathfrak{Q}_{b-a}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{a-c-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0907.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, c, 2a-c \\ b, a-\frac{1}{2}, 2a-b-1 \end{array}\right) =$$

$$\frac{2\sqrt{2}\, e^{\frac{\pi i}{2}(2b-2c+1)} \Gamma(b-c+1) \sin((2a-b-c)\pi)}{\pi} z^{a-\frac{3}{4}} \mathfrak{Q}_{b-a}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{a-c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-\infty, 0)$$

07.34.03.0908.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2}, c \\ b, c-\frac{1}{2}, c \end{array}\right) = \frac{2^{2a-b-c+\frac{3}{2}} \Gamma(2b-2a+1)}{\sqrt{\pi}} z^{\frac{1}{4}(2b+2c-1)} (z+1)^{a-\frac{2b+2c+1}{4}} Q_{b+c-2a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\frac{1}{\sqrt{z+1}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0909.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, 2b-a+1, a-\frac{1}{2} \\ b, b+\frac{1}{2}, a-\frac{1}{2} \end{array}\right) = 2\sqrt{\pi}\, \csc(2\pi(b-a))\, z^{b} F_{2a-2b-1}\left(2\sqrt{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0910.01

$$G_{3,3}^{2,2}\left(z \middle| \begin{array}{c} a, a+\frac{1}{2}, b+\frac{1}{2} \\ b, 2a-b, b+\frac{1}{2} \end{array}\right) = 2\sqrt{\pi}\, \csc(2(a-b)\pi)\, z^{a-\frac{1}{2}} F_{2a-2b}\left(\frac{2}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.0911.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a-\frac{1}{2} \\ a-\frac{3}{4}, a-\frac{1}{4}, a-1 \end{array}\right) = 2\sqrt{2\pi}\, z^{a-1} \cosh^{-1}\left(\sqrt{z+1}+\sqrt{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0912.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a-\frac{1}{2} \\ a, a, a-\frac{1}{2} \end{array}\right) = -\frac{z^a}{\pi (z+1)} \log\left(\frac{1}{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.0913.01

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

07.34.03.0914.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a \\ a, a, a-\frac{1}{2} \end{array}\right) = \frac{2 z^{a-\frac{1}{2}}}{\sqrt{\pi}\sqrt{z+1}} \log\left(\sqrt{z}+\sqrt{z+1}\right)$$

07.34.03.0915.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a \\ a, a, a-\frac{1}{2} \end{array}\right) = -\frac{2 z^{a-\frac{1}{2}}}{\sqrt{\pi}\sqrt{z+1}} \log\left(\sqrt{1+z}-\sqrt{z}\right)$$

07.34.03.0916.01

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

07.34.03.0917.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a+\frac{1}{2} \\ a, a, a \end{array}\right) = \frac{2 z^a}{\sqrt{\pi}\sqrt{z+1}} \log\left(\frac{\sqrt{z+1}+1}{\sqrt{z}}\right) /; z \notin (-1, 0)$$

07.34.03.0918.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a+\frac{1}{2} \\ a, a, a \end{array}\right) = -\frac{2 z^a}{\sqrt{\pi}\sqrt{z+1}} \log\left(\frac{\sqrt{z+1}-1}{\sqrt{z}}\right) /; z \notin (-1, 0)$$

07.34.03.0919.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a, a+\frac{1}{2} \\ a, a, a+\frac{1}{2} \end{array}\right) = -\frac{z^a \log(z)}{\pi (z+1)} /; z \notin (-\infty, 0)$$

07.34.03.0920.01

$$G_{3,3}^{2,2}\left(z \,\middle|\, \begin{array}{c} a, a+\frac{1}{2}, a+\frac{3}{4} \\ a-\frac{1}{4}, a-\frac{1}{4}, a+\frac{1}{4} \end{array}\right) = 2\sqrt{2\pi}\, z^{a-\frac{1}{4}} \cosh^{-1}\left(\frac{\sqrt{z+1}+1}{\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{2, 2, 3, 5\}$

07.34.03.0921.01

$$G_{3,5}^{2,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2, b_3, b_4, b_5 \end{matrix}\right) = \pi \csc(\pi (b_2 - b_1)) \left(\frac{\Gamma(b_1 - a_1 + 1)\, \Gamma(b_1 - a_2 + 1)}{\Gamma(a_3 - b_1)} z^{b_1} \, {}_3\tilde{F}_4(b_1 - a_1 + 1, b_1 - a_2 + 1, b_1 - a_3 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1, b_1 - b_5 + 1; -z) - \frac{\Gamma(b_2 - a_1 + 1)\, \Gamma(b_2 - a_2 + 1)}{\Gamma(a_3 - b_2)} z^{b_2} \, {}_3\tilde{F}_4(b_2 - a_1 + 1, b_2 - a_2 + 1, b_2 - a_3 + 1; b_2 - b_1 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1, b_2 - b_5 + 1; -z)\right)$$

07.34.03.0922.01

$$G_{3,5}^{2,2}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2}, c \\ b, c - \frac{1}{2}, c, 2a - b, 2a - c + \frac{1}{2} \end{matrix}\right) = -\sqrt{\pi}\, z^a J_{b+c-2a-\frac{1}{2}}\left(\sqrt{z}\right) Y_{b-c+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0923.01

$$G_{3,5}^{2,2}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2}, c \\ b, b + \frac{1}{2}, c, 2a - b - \frac{1}{2}, 2a - b \end{matrix}\right) = \sqrt{2}\, z^{a-\frac{1}{4}} \sin\left(\pi (c - b) + \sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0924.01

$$G_{3,5}^{2,2}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2}, 2a - b - 1 \\ b, 2a - b - \frac{1}{2}, 2a - b - 1, 2a - b, b + \frac{1}{2} \end{matrix}\right) = \sqrt{2}\, z^{a-\frac{1}{4}} \cos\left(\sqrt{z}\right) Y_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)$$

07.34.03.0925.01

$$G_{3,5}^{2,2}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2}, 2a - b \\ b, 2a - b + \frac{1}{2}, 2a - b, 2a - b, b - \frac{1}{2} \end{matrix}\right) = \sqrt{2}\, z^{a-\frac{1}{4}} \sin\left(\sqrt{z}\right) Y_{2b-2a-\frac{1}{2}}\left(\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{2, 2, 4, 2\}$

07.34.03.0926.01

$$G_{4,2}^{2,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2 \end{matrix}\right) = \pi \csc(\pi (a_1 - a_2)) \left(\Gamma(b_1 - a_1 + 1)\, \Gamma(b_2 - a_1 + 1)\, z^{a_1 - 1} \, {}_2F_3\left(b_1 - a_1 + 1, b_2 - a_1 + 1; a_2 - a_1 + 1, a_3 - a_1 + 1, a_4 - a_1 + 1; \frac{1}{z}\right) - \Gamma(b_1 - a_2 + 1)\, \Gamma(b_2 - a_2 + 1)\, z^{a_2 - 1} \, {}_2F_3\left(b_1 - a_2 + 1, b_2 - a_2 + 1; a_1 - a_2 + 1, a_3 - a_2 + 1, a_4 - a_2 + 1; \frac{1}{z}\right)\right)$$

07.34.03.0927.01

$$G_{4,2}^{2,2}\left(z \,\middle|\, \begin{matrix} a, c, 2b - a + 1, 2b - c + 1 \\ b, b + \frac{1}{2} \end{matrix}\right) = 2\sqrt{\pi}\, z^{b-\frac{1}{2}} I_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) K_{c-a}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0928.01

$$G_{4,2}^{2,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a + 1, c, 2b - c + 1 \\ b, b + \frac{1}{2} \end{matrix}\right) = \pi^{3/2} \csc(2(b - a)\pi)\, z^{b-\frac{1}{2}} \left(I_{2b-a-c+1}\left(\frac{1}{\sqrt{z}}\right) I_{c-a}\left(\frac{1}{\sqrt{z}}\right) - I_{a-c}\left(\frac{1}{\sqrt{z}}\right) I_{a+c-2b-1}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0929.01

$$G_{4,2}^{2,2}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a+\frac{1}{2},\, a+\frac{1}{2},\, 2b-a+1 \\ b,\, b+\frac{1}{2} \end{matrix}\right) = 2\sqrt{2}\, z^{b-\frac{1}{4}} \sinh\left(\frac{1}{\sqrt{z}}\right) K_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

07.34.03.0930.01

$$G_{4,2}^{2,2}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a+1,\, a-\frac{1}{2},\, 2b-a+\frac{3}{2} \\ b,\, b+\frac{1}{2} \end{matrix}\right) =$$
$$\sqrt{2}\,\pi\, z^{b-\frac{1}{4}} \csc((2a-2b-1)\pi)\left(\cosh\left(\frac{1}{\sqrt{z}}\right) I_{2b-2a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right) - \sinh\left(\frac{1}{\sqrt{z}}\right) I_{2a-2b-\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)\right)$$

07.34.03.0931.01

$$G_{4,2}^{2,2}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a+\frac{3}{2},\, a-\frac{1}{2},\, 2b-a+1 \\ b,\, b+\frac{1}{2} \end{matrix}\right) = 2\sqrt{2}\, z^{b-\frac{1}{4}} \cosh\left(\frac{1}{\sqrt{z}}\right) K_{2b-2a+\frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right)$$

Case $\{m, n, p, q\} = \{2, 2, 4, 6\}$

07.34.03.1107.01

$$G_{4,6}^{2,2}\left(z \,\middle|\, \begin{matrix} a_1,\, a_2,\, a_3,\, a_4 \\ b_1,\, b_2,\, b_3,\, b_4,\, b_5,\, b_6 \end{matrix}\right) =$$
$$\Big(\pi z^{b_1} \csc(\pi(b_2-b_1))\,\Gamma(-a_1+b_1+1)\,\Gamma(-a_2+b_1+1)\, {}_4F_5(-a_1+b_1+1,\, -a_2+b_1+1,\, -a_3+b_1+1,$$
$$-a_4+b_1+1;\, b_1-b_2+1,\, b_1-b_3+1,\, b_1-b_4+1,\, b_1-b_5+1,\, b_1-b_6+1;\, z)\Big)\Big/$$
$$(\Gamma(a_3-b_1)\,\Gamma(a_4-b_1)\,\Gamma(b_1-b_2+1)\,\Gamma(b_1-b_3+1)\,\Gamma(b_1-b_4+1)\,\Gamma(b_1-b_5+1)\,\Gamma(b_1-b_6+1)) +$$
$$\Big(\pi z^{b_2} \csc(\pi(b_1-b_2))\,\Gamma(-a_1+b_2+1)\,\Gamma(-a_2+b_2+1)\, {}_4F_5(-a_1+b_2+1,\, -a_2+b_2+1,\, -a_3+b_2+1,$$
$$-a_4+b_2+1;\, -b_1+b_2+1,\, b_2-b_3+1,\, b_2-b_4+1,\, b_2-b_5+1,\, b_2-b_6+1;\, z)\Big)\Big/$$
$$(\Gamma(a_3-b_2)\,\Gamma(a_4-b_2)\,\Gamma(-b_1+b_2+1)\,\Gamma(b_2-b_3+1)\,\Gamma(b_2-b_4+1)\,\Gamma(b_2-b_5+1)\,\Gamma(b_2-b_6+1))$$

07.34.03.1108.01

$$G_{4,6}^{2,2}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, b+\frac{1}{6},\, b+\frac{2}{3} \\ b,\, b+\frac{1}{3},\, 2a-b-\frac{1}{3},\, 2a-b,\, b+\frac{1}{6},\, b+\frac{2}{3} \end{matrix}\right) = \frac{\sqrt[6]{3}\, z^{a-\frac{1}{6}}}{2^{2/3}\sqrt{\pi}} \operatorname{Bi}\left(\left(\frac{3}{2}\right)^{2/3} \sqrt[3]{z}\right) I_{-2a+2b+\frac{1}{3}}\left(\sqrt{z}\right)$$

07.34.03.1109.01

$$G_{4,6}^{2,2}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, b+\frac{1}{3},\, b+\frac{5}{6} \\ b,\, b+\frac{2}{3},\, 2a-b-\frac{2}{3},\, 2a-b,\, b+\frac{1}{3},\, b+\frac{5}{6} \end{matrix}\right) = \frac{z^{a-\frac{1}{3}}}{\sqrt[3]{2}\,\sqrt[6]{3}\,\sqrt{\pi}} \operatorname{Bi}'\left(\left(\frac{3}{2}\right)^{2/3} \sqrt[3]{z}\right) I_{-2a+2b+\frac{2}{3}}\left(\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{2, 2, 5, 3\}$

07.34.03.0932.01

$$G_{5,3}^{2,2}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4, a_5 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi \csc(\pi (a_1 - a_2)) \left(\frac{\Gamma(b_1 - a_1 + 1)\, \Gamma(b_2 - a_1 + 1)}{\Gamma(a_1 - b_3)} z^{a_1 - 1} \, {}_3\tilde{F}_4\left(b_1 - a_1 + 1, b_2 - a_1 + 1, b_3 - a_1 + 1; a_2 - a_1 + 1, a_3 - a_1 + 1, a_4 - a_1 + 1, a_5 - a_1 + 1; -\frac{1}{z}\right) - \frac{\Gamma(b_1 - a_2 + 1)\, \Gamma(b_2 - a_2 + 1)}{\Gamma(a_2 - b_3)} z^{a_2 - 1} \, {}_3\tilde{F}_4\left(b_1 - a_2 + 1, b_2 - a_2 + 1, b_3 - a_2 + 1; a_1 - a_2 + 1, a_3 - a_2 + 1, a_4 - a_2 + 1, a_5 - a_2 + 1; -\frac{1}{z}\right)\right)$$

07.34.03.0933.01

$$G_{5,3}^{2,2}\left(z \,\middle|\, \begin{matrix} a, c + \frac{1}{2}, c, 2b - a + 1, 2b - c + \frac{1}{2} \\ b, b + \frac{1}{2}, c \end{matrix}\right) = -\sqrt{\pi}\, z^{b - \frac{1}{2}} J_{2b - a - c + \frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) Y_{c - a + \frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0934.01

$$G_{5,3}^{2,2}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2}, c, 2b - a + 1, 2b - a + \frac{1}{2} \\ b, b + \frac{1}{2}, c \end{matrix}\right) = \sqrt{2}\, z^{b - \frac{1}{4}} \cos\left(\pi (a - c) + \frac{1}{\sqrt{z}}\right) J_{2b - 2a + \frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0935.01

$$G_{5,3}^{2,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a + \frac{1}{2}, a + \frac{1}{2}, 2b - a + 1, 2b - a + 1 \\ b, b + \frac{1}{2}, 2b - a + 1 \end{matrix}\right) = \sqrt{2}\, z^{b - \frac{1}{4}} \sin\left(\frac{1}{\sqrt{z}}\right) Y_{2b - 2a + \frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) /;\, z \notin (-\infty, 0)$$

07.34.03.0936.01

$$G_{5,3}^{2,2}\left(z \,\middle|\, \begin{matrix} a, 2b - a + \frac{3}{2}, a - \frac{1}{2}, 2b - a + 1, 2b - a + 2 \\ b, b + \frac{1}{2}, 2b - a + 2 \end{matrix}\right) = \sqrt{2}\, z^{b - \frac{1}{4}} \cos\left(\frac{1}{\sqrt{z}}\right) Y_{2b - 2a + \frac{3}{2}}\left(\frac{1}{\sqrt{z}}\right) /;\, z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{2, 3, 3, 2\}$

07.34.03.0937.01

$$G_{3,2}^{2,3}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2 \end{matrix}\right) = \pi^2 \Big(\csc(\pi (a_1 - a_2)) \csc(\pi (a_1 - a_3))\, \Gamma(1 - a_1 + b_1)\, \Gamma(1 - a_1 + b_2)\, z^{a_1 - 1} \, {}_2\tilde{F}_2\left(1 - a_1 + b_1, 1 - a_1 + b_2; 1 - a_1 + a_2, 1 - a_1 + a_3; -\frac{1}{z}\right) + \csc(\pi (a_2 - a_1)) \csc(\pi (a_2 - a_3))\, \Gamma(1 - a_2 + b_1)\, \Gamma(1 - a_2 + b_2)\, z^{a_2 - 1} \, {}_2\tilde{F}_2\left(1 - a_2 + b_1, 1 - a_2 + b_2; a_1 - a_2 + 1, 1 - a_2 + a_3; -\frac{1}{z}\right) + \csc(\pi (a_3 - a_1)) \csc(\pi (a_3 - a_2))\, \Gamma(1 - a_3 + b_1)\, \Gamma(1 - a_3 + b_2)\, z^{a_3 - 1} \, {}_2\tilde{F}_2\left(1 - a_3 + b_1, 1 - a_3 + b_2; a_1 - a_3 + 1, a_2 - a_3 + 1; -\frac{1}{z}\right)\Big) /;\, a_2 - a_1 \notin \mathbb{Z} \land a_3 - a_1 \notin \mathbb{Z} \land a_3 - a_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 3, 3, 3\}$

07.34.03.0938.01

$$G_{3,3}^{2,3}\left(z\,\middle|\,\begin{matrix}a_1, a_2, a_3\\ b_1, b_2, b_3\end{matrix}\right) = \pi\csc(\pi(b_2-b_1))\left(\Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\,\Gamma(1-a_3+b_1)\,z^{b_1}\,{}_3\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1, 1-a_3+b_1; b_1-b_2+1, b_1-b_3+1; z) - \Gamma(1-a_1+b_2)\,\Gamma(1-a_2+b_2)\,\Gamma(1-a_3+b_2)\,z^{b_2}\,{}_3\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2, 1-a_3+b_2; 1-b_1+b_2, b_2-b_3+1; z)\right) /; a_2-a_1\notin\mathbb{Z}\bigwedge b_2-b_1\notin\mathbb{Z}$$

Case $\{m, n, p, q\} = \{2, 3, 4, 2\}$

07.34.03.0939.01

$$G_{4,2}^{2,3}\left(z\,\middle|\,\begin{matrix}a_1, a_2, a_3, a_4\\ b_1, b_2\end{matrix}\right) = \pi^2\csc(\pi(a_1-a_2))\csc(\pi(a_1-a_3))\,\Gamma(-a_1+b_1+1)\,\Gamma(-a_1+b_2+1)\,z^{a_1-1}\,{}_2\tilde{F}_3\left(-a_1+b_1+1, -a_1+b_2+1; -a_1+a_2+1, -a_1+a_3+1, -a_1+a_4+1; -\frac{1}{z}\right) + \pi^2\csc(\pi(a_2-a_1))\csc(\pi(a_2-a_3))\,\Gamma(-a_2+b_1+1)\,\Gamma(-a_2+b_2+1)\,z^{a_2-1}\,{}_2\tilde{F}_3\left(-a_2+b_1+1, -a_2+b_2+1; a_1-a_2+1, -a_2+a_3+1, -a_2+a_4+1; -\frac{1}{z}\right) + \pi^2\csc(\pi(a_3-a_1))\csc(\pi(a_3-a_2))\,\Gamma(-a_3+b_1+1)\,\Gamma(-a_3+b_2+1)\,z^{a_3-1}\,{}_2\tilde{F}_3\left(-a_3+b_1+1, -a_3+b_2+1; a_1-a_3+1, a_2-a_3+1, -a_3+a_4+1; -\frac{1}{z}\right) /; z\notin(-\infty, 0)\bigwedge a_2-a_1\notin\mathbb{Z}\bigwedge a_3-a_1\notin\mathbb{Z}\bigwedge a_3-a_2\notin\mathbb{Z}$$

07.34.03.0940.01

$$G_{4,2}^{2,3}\left(z\,\middle|\,\begin{matrix}a, c, 2b-c, 2b-a\\ b, b-\frac{1}{2}\end{matrix}\right) = \pi^{5/2}\csc(2(c-b)\pi)\,z^{b-1}\left(J_{c-a}\left(\frac{1}{\sqrt{z}}\right)Y_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right) - J_{2b-a-c}\left(\frac{1}{\sqrt{z}}\right)Y_{c-a}\left(\frac{1}{\sqrt{z}}\right)\right) /; z\notin(-\infty, 0)$$

07.34.03.0941.01

$$G_{4,2}^{2,3}\left(z\,\middle|\,\begin{matrix}a, c, a+\frac{1}{2}, c-\frac{1}{2}\\ b, b+\frac{1}{2}\end{matrix}\right) = 4^{a-b}\sqrt{\pi}\,z^{c-1}\,\Gamma(2b-2a+1)\,\Gamma(2b-2c+2)\left(U\left(2(b-c+1), 2(a-c+1), \frac{2}{\sqrt{-z}}\right) + U\left(2(b-c+1), 2(a-c+1), -\frac{2}{\sqrt{-z}}\right)\right) /; z\notin(-\infty, 0)$$

07.34.03.0942.01

$$G_{4,2}^{2,3}\left(z\,\middle|\,\begin{matrix}a, c, a+\frac{1}{2}, c+\frac{1}{2}\\ b, b+\frac{1}{2}\end{matrix}\right) = 4^{a-b}\sqrt{\pi}\,\Gamma(2b-2a+1)\,\Gamma(2b-2c+1)\sqrt{-z}\,z^{c-1}\left(U\left(2b-2c+1, 2a-2c+1, -\frac{2}{\sqrt{-z}}\right) - U\left(2b-2c+1, 2a-2c+1, \frac{2}{\sqrt{-z}}\right)\right) /; z\notin(-\infty, 0)$$

07.34.03.0943.01

$$G_{4,2}^{2,3}\left(z\,\middle|\,\begin{matrix}a, b, b+\frac{1}{2}, a-\frac{1}{2}\\ b, b+\frac{1}{2}\end{matrix}\right) = \sqrt{\pi}\,z^{a-1}\,\Gamma(2b-2a+2)\left(e^{-2\sqrt{-\frac{1}{z}}}\,\Gamma\left(2a-2b-1, -2\sqrt{-\frac{1}{z}}\right) + e^{2\sqrt{-\frac{1}{z}}}\,\Gamma\left(2a-2b-1, 2\sqrt{-\frac{1}{z}}\right)\right)$$

07.34.03.0944.01

$$G_{4,2}^{2,3}\left(z \,\middle|\, \begin{matrix} a, b, b+\frac{1}{2}, a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = i\sqrt{\pi}\, z^{a-\frac{1}{2}}\, \Gamma(2b-2a+1)\left(e^{2\sqrt{-\frac{1}{z}}}\, \Gamma\left(2a-2b, 2\sqrt{-\frac{1}{z}}\right) - e^{-2\sqrt{-\frac{1}{z}}}\, \Gamma\left(2a-2b, -2\sqrt{-\frac{1}{z}}\right)\right) /; 0 \le \arg(z) \le \frac{\pi}{2}$$

07.34.03.0945.01

$$G_{4,2}^{2,3}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+\frac{1}{2}, 2b-a+1 \\ b, b+\frac{1}{2} \end{matrix}\right) = \sqrt{2}\, \pi^2 z^{b-\frac{1}{4}} \csc(2(a-b)\pi)\left(\cos\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) + \sin\left(\frac{1}{\sqrt{z}}\right) Y_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0946.01

$$G_{4,2}^{2,3}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+1, 2b-a+\frac{1}{2} \\ b, b+\frac{1}{2} \end{matrix}\right) = \sqrt{2}\, \pi^2 \csc(2(b-a)\pi)\, z^{b-\frac{1}{4}}\left(\cos\left(\frac{1}{\sqrt{z}}\right) Y_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) - \sin\left(\frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{2, 4, 5, 3\}$

07.34.03.0947.01

$$G_{5,3}^{2,4}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2}, 2b-a+\frac{1}{2}, 2b-a+1, c \\ b, b+\frac{1}{2}, c \end{matrix}\right) = \sqrt{2}\, \pi^2 z^{b-\frac{1}{4}} \csc(2(b-a)\pi) \left(\cos\left(\pi(a-2b+c) + \frac{1}{\sqrt{z}}\right) J_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right) + \sin\left(\pi(a-2b+c) + \frac{1}{\sqrt{z}}\right) Y_{2b-2a+\frac{1}{2}}\left(\frac{1}{\sqrt{z}}\right)\right) /; z \notin (-\infty, 0)$$

Cases with $m == 3$

Case $\{m, n, p, q\} = \{3, 0, 0, 3\}$

07.34.03.0948.01

$$G_{0,3}^{3,0}(z \mid b_1, b_2, b_3) = \pi^2 \Big(\csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))\, z^{b_1}\, {}_0\tilde{F}_2(; b_1-b_2+1, b_1-b_3+1; -z) + \csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))\, z^{b_2}\, {}_0\tilde{F}_2(; 1-b_1+b_2, b_2-b_3+1; -z) + \csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))\, z^{b_3}\, {}_0\tilde{F}_2(; 1-b_1+b_3, 1-b_2+b_3; -z)\Big) /; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

07.34.03.1110.01

$$G_{0,3}^{3,0}\left(z \,\middle|\, b, b+\frac{1}{3}, b+\frac{2}{3}\right) = \frac{2\pi}{\sqrt{3}}\, z^b\, e^{-3\sqrt[3]{z}}$$

Case $\{m, n, p, q\} = \{3, 0, 0, 4\}$

07.34.03.0949.01

$$G_{0,4}^{3,0}(z \mid b_1, b_2, b_3, b_4) = \pi^2 \csc(\pi(b_2-b_1)) \csc(\pi(b_3-b_1)) z^{b_1} {}_0\tilde{F}_3(; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1; -z) + \pi^2 \csc(\pi(b_1-b_2)) \csc(\pi(b_3-b_2)) z^{b_2} {}_0\tilde{F}_3(; -b_1+b_2+1, b_2-b_3+1, b_2-b_4+1; -z) + \pi^2 \csc(\pi(b_1-b_3)) \csc(\pi(b_2-b_3)) z^{b_3} {}_0\tilde{F}_3(; -b_1+b_3+1, -b_2+b_3+1, b_3-b_4+1; -z) \;/;\; b_2-b_1 \notin \mathbb{Z} \wedge b_3-b_1 \notin \mathbb{Z} \wedge b_3-b_2 \notin \mathbb{Z}$$

07.34.03.0950.01

$$G_{0,4}^{3,0}\left(z \,\middle|\, b, c, b+\tfrac{1}{2}, 2b-c\right) = 4\sqrt{\pi}\, z^b J_{2(c-b)}\left(2\sqrt{2}\sqrt[4]{z}\right) K_{2(c-b)}\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0951.01

$$G_{0,4}^{3,0}\left(z \,\middle|\, b, c, 2b-c-1, b-\tfrac{1}{2}\right) = 2\sqrt{\pi}\csc((b-c)\pi)\, z^{b-\frac{1}{2}} \left(J_{2c-2b+1}\left(2\sqrt{2}\sqrt[4]{z}\right) + J_{2b-2c-1}\left(2\sqrt{2}\sqrt[4]{z}\right)\right) K_{2c-2b+1}\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0952.01

$$G_{0,4}^{3,0}\left(z \,\middle|\, b, c, 2b-c, b+\tfrac{1}{2}\right) = 2\sqrt{\pi}\csc((c-b)\pi)\, z^b \left(J_{2b-2c}\left(2\sqrt{2}\sqrt[4]{z}\right) - J_{2c-2b}\left(2\sqrt{2}\sqrt[4]{z}\right)\right) K_{2c-2b}\left(2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0953.01

$$G_{0,4}^{3,0}\left(z \,\middle|\, a, a+\tfrac{1}{4}, a+\tfrac{1}{2}, a-\tfrac{1}{4}\right) = \sqrt{2\pi}\, z^{a-\frac{1}{4}} \sin\left(2\sqrt{2}\sqrt[4]{z}\right) \exp\left(-2\sqrt{2}\sqrt[4]{z}\right)$$

07.34.03.0954.01

$$G_{0,4}^{3,0}\left(z \,\middle|\, a, a+\tfrac{1}{4}, a+\tfrac{3}{4}, a+\tfrac{1}{2}\right) = \sqrt{2\pi}\, z^a \exp\left(-2\sqrt{2}\sqrt[4]{z}\right) \cos\left(2\sqrt{2}\sqrt[4]{z}\right)$$

Case $\{m, n, p, q\} = \{3, 0, 1, 3\}$

07.34.03.0955.01

$$G_{1,3}^{3,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi^2 \left(\frac{\csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))}{\Gamma(a_1-b_1)} z^{b_1} {}_1\tilde{F}_2(1-a_1+b_1; b_1-b_2+1, b_1-b_3+1; z) + \frac{\csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))}{\Gamma(a_1-b_2)} z^{b_2} {}_1\tilde{F}_2(1-a_1+b_2; 1-b_1+b_2, b_2-b_3+1; z) + \frac{\csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))}{\Gamma(a_1-b_3)} z^{b_3} {}_1\tilde{F}_2(-a_1+b_3+1; -b_1+b_3+1, -b_2+b_3+1; z)\right) /;\; b_2-b_1 \notin \mathbb{Z} \wedge b_3-b_1 \notin \mathbb{Z} \wedge b_3-b_2 \notin \mathbb{Z}$$

07.34.03.0956.01

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

07.34.03.0957.01

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

07.34.03.0958.01

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

07.34.03.0959.01

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

07.34.03.0960.01

$$G_{1,3}^{3,0}\left(z \,\middle|\, \begin{matrix} a \\ a-1, a-\frac{3}{4}, a-\frac{1}{4} \end{matrix}\right) = \sqrt{2}\, \pi z^{a-1} \left(1 - \operatorname{erf}\left(\sqrt{2}\sqrt[4]{z}\right)\right)$$

Case $\{m, n, p, q\} = \{3, 0, 1, 4\}$

07.34.03.0961.01

$$G_{1,4}^{3,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) = \frac{\pi^2 z^{b_1} \csc(\pi (b_2 - b_1)) \csc(\pi (b_3 - b_1))}{\Gamma(a_1 - b_1)} \, {}_1\tilde{F}_3(-a_1 + b_1 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; z) + \frac{\pi^2 z^{b_2} \csc(\pi (b_1 - b_2)) \csc(\pi (b_3 - b_2))}{\Gamma(a_1 - b_2)} \, {}_1\tilde{F}_3(-a_1 + b_2 + 1; -b_1 + b_2 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1; z) + \frac{\pi^2 z^{b_3} \csc(\pi (b_1 - b_3)) \csc(\pi (b_2 - b_3))}{\Gamma(a_1 - b_3)} \, {}_1\tilde{F}_3(-a_1 + b_3 + 1; -b_1 + b_3 + 1, -b_2 + b_3 + 1, b_3 - b_4 + 1; z) \,/;\, b_2 - b_1 \notin \mathbb{Z} \bigwedge b_3 - b_1 \notin \mathbb{Z} \bigwedge b_3 - b_2 \notin \mathbb{Z}$$

07.34.03.0962.01

$$G_{1,4}^{3,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, a - \frac{1}{6}, a + \frac{1}{6}, a \end{matrix}\right) = \frac{2 z^{a-\frac{1}{2}}}{\sqrt{3}} \exp\left(-\frac{3}{2} \sqrt[3]{z}\right) \cos\left(\frac{3^{3/2}}{2} \sqrt[3]{z}\right)$$

Case $\{m, n, p, q\} = \{3, 0, 1, 5\}$

07.34.03.0963.01

$$G_{1,5}^{3,0}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2, b_3, b_4, b_5 \end{matrix}\right) = \frac{\pi^2 \csc(\pi (b_2 - b_1)) \csc(\pi (b_3 - b_1))}{\Gamma(a_1 - b_1)} z^{b_1} \, {}_1\tilde{F}_4(-a_1 + b_1 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1, b_1 - b_5 + 1; z) + \frac{\pi^2 \csc(\pi (b_1 - b_2)) \csc(\pi (b_3 - b_2))}{\Gamma(a_1 - b_2)} z^{b_2} \, {}_1\tilde{F}_4(-a_1 + b_2 + 1; -b_1 + b_2 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1, b_2 - b_5 + 1; z) + \frac{\pi^2 \csc(\pi (b_1 - b_3)) \csc(\pi (b_2 - b_3))}{\Gamma(a_1 - b_3)} z^{b_3} \, {}_1\tilde{F}_4(-a_1 + b_3 + 1; -b_1 + b_3 + 1, -b_2 + b_3 + 1, b_3 - b_4 + 1, b_3 - b_5 + 1; z) \,/;\, b_2 - b_1 \notin \mathbb{Z} \bigwedge b_3 - b_1 \notin \mathbb{Z} \bigwedge b_3 - b_2 \notin \mathbb{Z}$$

07.34.03.0964.01

$$G_{1,5}^{3,0}\left(z \,\middle|\, \begin{matrix} a \\ a - \frac{1}{2}, \frac{n-1}{2} + a, a + \frac{n}{2}, a, a \end{matrix}\right) = z^{\frac{n-2}{4}+a} \left(\frac{2}{\pi} K_n\left(4 \sqrt[4]{z}\right) - Y_n\left(4 \sqrt[4]{z}\right)\right) /; n \in \mathbb{Z}$$

07.34.03.0965.01

$$G_{1,5}^{3,0}\left(z \,\middle|\, \begin{matrix} a \\ a + \frac{1}{2}, a + \frac{n}{2}, \frac{n+1}{2} + a, a, a \end{matrix}\right) = z^{a+\frac{n}{4}} \left(\frac{2}{\pi} K_n\left(4 \sqrt[4]{z}\right) + Y_n\left(4 \sqrt[4]{z}\right)\right) /; n \in \mathbb{Z}$$

Case $\{m, n, p, q\} = \{3, 0, 2, 3\}$

07.34.03.0966.01

$$G_{2,3}^{3,0}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2, b_3 \end{array}\right) = \pi^2 \left(\frac{\csc(\pi (b_2 - b_1)) \csc(\pi (b_3 - b_1))}{\Gamma(a_1 - b_1) \Gamma(a_2 - b_1)} z^{b_1} \, {}_2\tilde{F}_2(1 - a_1 + b_1, 1 - a_2 + b_1; b_1 - b_2 + 1, b_1 - b_3 + 1; -z) + \frac{\csc(\pi (b_1 - b_2)) \csc(\pi (b_3 - b_2))}{\Gamma(a_1 - b_2) \Gamma(a_2 - b_2)} z^{b_2} \, {}_2\tilde{F}_2(1 - a_1 + b_2, 1 - a_2 + b_2; 1 - b_1 + b_2, b_2 - b_3 + 1; -z) + \frac{\csc(\pi (b_1 - b_3)) \csc(\pi (b_2 - b_3))}{\Gamma(a_1 - b_3) \Gamma(a_2 - b_3)} z^{b_3} \, {}_2\tilde{F}_2(1 - a_1 + b_3, 1 - a_2 + b_3; 1 - b_1 + b_3, 1 - b_2 + b_3; -z) \right) /; b_2 - b_1 \notin \mathbb{Z} \wedge b_3 - b_1 \notin \mathbb{Z} \wedge b_3 - b_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{3, 0, 2, 4\}$

07.34.03.0967.01

$$G_{2,4}^{3,0}\left(z \middle| \begin{array}{c} a_1, a_2 \\ b_1, b_2, b_3, b_4 \end{array}\right) = \frac{\pi^2 \csc(\pi (b_2 - b_1)) \csc(\pi (b_3 - b_1))}{\Gamma(a_1 - b_1) \Gamma(a_2 - b_1)} z^{b_1} \, {}_2\tilde{F}_3(-a_1 + b_1 + 1, -a_2 + b_1 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; -z) + \frac{\pi^2 \csc(\pi (b_1 - b_2)) \csc(\pi (b_3 - b_2))}{\Gamma(a_1 - b_2) \Gamma(a_2 - b_2)} z^{b_2} \, {}_2\tilde{F}_3(-a_1 + b_2 + 1, -a_2 + b_2 + 1; -b_1 + b_2 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1; -z) + \frac{\pi^2 \csc(\pi (b_1 - b_3)) \csc(\pi (b_2 - b_3))}{\Gamma(a_1 - b_3) \Gamma(a_2 - b_3)} z^{b_3} \, {}_2\tilde{F}_3(-a_1 + b_3 + 1, -a_2 + b_3 + 1; -b_1 + b_3 + 1, -b_2 + b_3 + 1, b_3 - b_4 + 1; -z) /; b_2 - b_1 \notin \mathbb{Z} \wedge b_3 - b_1 \notin \mathbb{Z} \wedge b_3 - b_2 \notin \mathbb{Z}$$

07.34.03.0968.01

$$G_{2,4}^{3,0}\left(z \middle| \begin{array}{c} a, a + \frac{1}{2} \\ b, c, 2a - c, 2a - b \end{array}\right) = -\frac{\sqrt{\pi}}{2} z^a \left(J_{b+c-2a}\left(\sqrt{z}\right) Y_{b-c}\left(\sqrt{z}\right) + J_{b-c}\left(\sqrt{z}\right) Y_{b+c-2a}\left(\sqrt{z}\right) \right)$$

07.34.03.0969.01

$$G_{2,4}^{3,0}\left(z \middle| \begin{array}{c} a, a \\ b, a - \frac{1}{2}, 2a - b - 1, a \end{array}\right) = \frac{\sqrt{\pi}}{2} z^{a-\frac{1}{2}} \left(Y_{a-b-\frac{1}{2}}\left(\sqrt{z}\right) Y_{b-a+\frac{1}{2}}\left(\sqrt{z}\right) - J_{a-b-\frac{1}{2}}\left(\sqrt{z}\right) J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right) \right)$$

07.34.03.0970.01

$$G_{2,4}^{3,0}\left(z \middle| \begin{array}{c} a, a + \frac{1}{2} \\ b, b + \frac{1}{2}, 2a - b - \frac{1}{2}, 2a - b \end{array}\right) = -\frac{z^{a-\frac{1}{4}}}{\sqrt{2}} \left(\cos\left(\sqrt{z}\right) Y_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) + \sin\left(\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) \right)$$

07.34.03.0971.01

$$G_{2,4}^{3,0}\left(z \middle| \begin{array}{c} a, a + \frac{1}{2} \\ b, b + \frac{1}{2}, 2a - b, 2a - b - \frac{1}{2} \end{array}\right) = \frac{z^{a-\frac{1}{4}}}{\sqrt{2}} \left(\cos\left(\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) - \sin\left(\sqrt{z}\right) Y_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) \right)$$

07.34.03.0972.01

$$G_{2,4}^{3,0}\left(z \middle| \begin{array}{c} a, 2a - b - \frac{1}{2} \\ b, a - \frac{1}{2}, 2a - b - 1, 2a - b - \frac{1}{2} \end{array}\right) = \frac{\sqrt{\pi}}{2} z^{a-\frac{1}{2}} \left(Y_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)^2 - J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)^2 \right)$$

Case $\{m, n, p, q\} = \{3, 0, 2, 6\}$

07.34.03.0973.01

$$G_{2,6}^{3,0}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3, b_4, b_5, b_6 \end{matrix}\right) = \frac{\pi^2 \csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))}{\Gamma(a_1-b_1)\Gamma(a_2-b_1)} z^{b_1} \, {}_2\tilde{F}_5(-a_1+b_1+1, -a_2+b_1+1; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1, b_1-b_5+1, b_1-b_6+1; -z) + \frac{\pi^2 \csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))}{\Gamma(a_1-b_2)\Gamma(a_2-b_2)} z^{b_2} \, {}_2\tilde{F}_5(-a_1+b_2+1, -a_2+b_2+1; -b_1+b_2+1, b_2-b_3+1, b_2-b_4+1, b_2-b_5+1, b_2-b_6+1; -z) + \frac{\pi^2 \csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))}{\Gamma(a_1-b_3)\Gamma(a_2-b_3)} z^{b_3} \, {}_2\tilde{F}_5(-a_1+b_3+1, -a_2+b_3+1; -b_1+b_3+1, -b_2+b_3+1, b_3-b_4+1, b_3-b_5+1, b_3-b_6+1; -z) \;/;\; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

07.34.03.0974.01

$$G_{2,6}^{3,0}\left(z \,\middle|\, \begin{matrix} a, a+\frac{1}{2} \\ a-\frac{1}{4}, a+\frac{1}{4}, b, a, a+\frac{1}{2}, 2a-b-\frac{1}{2} \end{matrix}\right) = -\frac{z^{a-\frac{1}{4}}}{\sqrt{\pi}} I_{2b-2a+\frac{1}{2}}\left(2\sqrt{2}\sqrt[4]{z}\right) Y_{2b-2a+\frac{1}{2}}\left(2\sqrt{2}\sqrt[4]{z}\right)$$

Case $\{m, n, p, q\} = \{3, 0, 2, 6\}$

07.34.03.0975.01

$$G_{3,3}^{3,0}\left(z \,\middle|\, \begin{matrix} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi^2 \left(\frac{\csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))}{\Gamma(a_1-b_1)\Gamma(a_2-b_1)\Gamma(a_3-b_1)} z^{b_1} \, {}_3\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1, 1-a_3+b_1; b_1-b_2+1, b_1-b_3+1; z) + \frac{\csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))}{\Gamma(a_1-b_2)\Gamma(a_2-b_2)\Gamma(a_3-b_2)} z^{b_2} \, {}_3\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2, 1-a_3+b_2; 1-b_1+b_2, b_2-b_3+1; z) + \frac{\csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))}{\Gamma(a_1-b_3)\Gamma(a_2-b_3)\Gamma(a_3-b_3)} z^{b_3} \, {}_3\tilde{F}_2(1-a_1+b_3, 1-a_2+b_3, 1-a_3+b_3; 1-b_1+b_3, 1-b_2+b_3; z) \right) \theta(1-|z|) \;/;\; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

07.34.03.0976.01

$$G_{3,3}^{3,0}\left(z \,\middle|\, \begin{matrix} a, c, d \\ b, e, a-b+d-e \end{matrix}\right) = \frac{\theta(1-|z|)}{\Gamma(c)} z^{b-c+e} (1-z)^{c-1} F_{1\times 0\times 0}^{0\times 2\times 2}\left(\begin{matrix} ; b-a+e, b-d+e; c-e, c-b; \\ c;;; \end{matrix} \; 1-z, \frac{z-1}{z} \right)$$

07.34.03.0977.01

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

Case $\{m, n, p, q\} = \{3, 1, 1, 3\}$

07.34.03.0978.01

$$G_{1,3}^{3,1}\left(z \,\middle|\, \begin{matrix} a_1 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi^2 \left(\csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))\Gamma(1-a_1+b_1) z^{b_1} \, {}_1\tilde{F}_2(1-a_1+b_1; b_1-b_2+1, b_1-b_3+1; -z) + \csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))\Gamma(1-a_1+b_2) z^{b_2} \, {}_1\tilde{F}_2(1-a_1+b_2; 1-b_1+b_2, b_2-b_3+1; -z) + \csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))\Gamma(1-a_1+b_3) z^{b_3} \, {}_1\tilde{F}_2(1-a_1+b_3; 1-b_1+b_3, 1-b_2+b_3; -z) \right) \;/;\; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

07.34.03.0979.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ b, b+\frac{1}{2}, a \end{matrix}\right) = \sqrt{\pi}\, z^b\, \Gamma(2b-2a+1)\left(e^{i(a-b)\pi-2\sqrt{-z}}\, \Gamma\left(2(a-b), -2\sqrt{-z}\right) + e^{-i(a-b)\pi+2\sqrt{-z}}\, \Gamma\left(2(a-b), 2\sqrt{-z}\right)\right) /; \operatorname{Re}(z) < 0$$

07.34.03.0980.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ b, a-\frac{1}{2}, a \end{matrix}\right) = \pi^2 \csc((a-b)\pi)\, z^{\frac{1}{4}(2a+2b-1)} \left(\boldsymbol{H}_{a-b-\frac{1}{2}}\left(2\sqrt{z}\right) - Y_{a-b-\frac{1}{2}}\left(2\sqrt{z}\right)\right)$$

07.34.03.0981.01

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

07.34.03.0982.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ b, a-\frac{1}{2}, 2a-b-1 \end{matrix}\right) = \pi^{5/2} \csc(2(a-b)\pi)\, z^{a-\frac{1}{2}} \left(J_{b-a+\frac{1}{2}}\left(\sqrt{z}\right) Y_{a-b-\frac{1}{2}}\left(\sqrt{z}\right) - J_{a-b-\frac{1}{2}}\left(\sqrt{z}\right) Y_{b-a+\frac{1}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.0983.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ a-\frac{3}{4}, a-\frac{1}{4}, a \end{matrix}\right) = (2\pi)^{3/2} z^{a-\frac{3}{4}} \left(\cos\left(2\sqrt{z}\right)\left(\frac{1}{2} - S\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right) - \sin\left(2\sqrt{z}\right)\left(\frac{1}{2} - C\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)\right)$$

07.34.03.0984.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ a-\frac{1}{2}, a, a \end{matrix}\right) = -2\sqrt{\pi}\, z^{a-\frac{1}{2}} \left(\cos\left(2\sqrt{z}\right)\left(\operatorname{Si}\left(2\sqrt{z}\right) - \frac{\pi}{2}\right) - \sin\left(2\sqrt{z}\right) \operatorname{Ci}\left(2\sqrt{z}\right)\right)$$

07.34.03.0985.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ a-\frac{1}{4}, a, a+\frac{1}{4} \end{matrix}\right) = (2\pi)^{3/2} z^{a-\frac{1}{4}} \left(\cos\left(2\sqrt{z}\right)\left(\frac{1}{2} - C\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right) + \sin\left(2\sqrt{z}\right)\left(\frac{1}{2} - S\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)\right)$$

07.34.03.0986.01

$$G_{1,3}^{3,1}\left(z \middle| \begin{matrix} a \\ a, a, a+\frac{1}{2} \end{matrix}\right) = -2\sqrt{\pi}\, z^{a} \left(\cos\left(2\sqrt{z}\right) \operatorname{Ci}\left(2\sqrt{z}\right) + \left(\operatorname{Si}\left(2\sqrt{z}\right) - \frac{\pi}{2}\right) \sin\left(2\sqrt{z}\right)\right)$$

Case $\{m, n, p, q\} = \{3, 1, 2, 3\}$

07.34.03.0987.01

$$G_{2,3}^{3,1}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi^2 \left(\frac{\csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))\,\Gamma(1-a_1+b_1)}{\Gamma(a_2-b_1)} z^{b_1}\, {}_2\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1, b_1-b_3+1; z) + \frac{\csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))\,\Gamma(1-a_1+b_2)}{\Gamma(a_2-b_2)} z^{b_2}\, {}_2\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2; 1-b_1+b_2, b_2-b_3+1; z) + \frac{\csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))\,\Gamma(1-a_1+b_3)}{\Gamma(a_2-b_3)} z^{b_3}\, {}_2\tilde{F}_2(1-a_1+b_3, 1-a_2+b_3; 1-b_1+b_3, 1-b_2+b_3; z)\right) /;$$

$$b_2 - b_1 \notin \mathbb{Z} \land b_3 - b_1 \notin \mathbb{Z} \land b_3 - b_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{3, 1, 2, 4\}$

07.34.03.0988.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) = \frac{\pi^2 \csc(\pi (b_2 - b_1)) \csc(\pi (b_3 - b_1)) \Gamma(-a_1 + b_1 + 1)}{\Gamma(a_2 - b_1)} z^{b_1} {}_2\tilde{F}_3(-a_1 + b_1 + 1, -a_2 + b_1 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; z) + \frac{\pi^2 \csc(\pi (b_1 - b_2)) \csc(\pi (b_3 - b_2)) \Gamma(-a_1 + b_2 + 1)}{\Gamma(a_2 - b_2)} z^{b_2} {}_2\tilde{F}_3(-a_1 + b_2 + 1, -a_2 + b_2 + 1; -b_1 + b_2 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1; z) + \frac{\pi^2 \csc(\pi (b_1 - b_3)) \csc(\pi (b_2 - b_3)) \Gamma(-a_1 + b_3 + 1)}{\Gamma(a_2 - b_3)} z^{b_3} {}_2\tilde{F}_3(-a_1 + b_3 + 1, -a_2 + b_3 + 1; -b_1 + b_3 + 1, -b_2 + b_3 + 1, b_3 - b_4 + 1; z) \,/;\, b_2 - b_1 \notin \mathbb{Z} \land b_3 - b_1 \notin \mathbb{Z} \land b_3 - b_2 \notin \mathbb{Z}$$

07.34.03.0989.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, \frac{a+c-1}{2}, \frac{a+c}{2}, a - b + c - 1 \end{matrix}\right) = \frac{2^{2b-a-c+2} \sqrt{\pi}\, z^b \Gamma(b - a + 1)}{\Gamma(2b - a - c + 2)} {}_1F_1\left(b - a + 1; 2b - a - c + 2; -2\sqrt{z}\right) U\left(b - a + 1, 2b - a - c + 2, 2\sqrt{z}\right)$$

07.34.03.0990.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a, c \\ b, \frac{a+c-1}{2}, \frac{a+c}{2}, a - b + c - 1 \end{matrix}\right) = \frac{2^{2b-a-c+2} \sqrt{\pi}\, \Gamma(b - a + 1)}{\Gamma(2b - a - c + 2)} z^b e^{-2\sqrt{z}} {}_1F_1\left(b - c + 1; 2b - a - c + 2; 2\sqrt{z}\right) U\left(b - a + 1, 2b - a - c + 2, 2\sqrt{z}\right)$$

07.34.03.0991.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a, a - \frac{1}{2} \\ b, c, 2a - c - 1, 2a - b - 1 \end{matrix}\right) = \sqrt{\pi} \csc((a - c)\pi) z^{a-\frac{1}{2}} \left(I_{b+c-2a+1}\left(\sqrt{z}\right) K_{b-c}\left(\sqrt{z}\right) + I_{b-c}\left(\sqrt{z}\right) K_{b+c-2a+1}\left(\sqrt{z}\right)\right)$$

07.34.03.0992.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2} \\ b, c, 2a - c, 2a - b \end{matrix}\right) = \sqrt{\pi} \csc((c - a)\pi) z^a \left(I_{b-c}\left(\sqrt{z}\right) K_{b+c-2a}\left(\sqrt{z}\right) - I_{b+c-2a}\left(\sqrt{z}\right) K_{b-c}\left(\sqrt{z}\right)\right)$$

07.34.03.0993.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a, 2b - a + 1 \\ b, c, b + \frac{1}{2}, 2b - c \end{matrix}\right) = \frac{2^{2c-2b+1} \sqrt{\pi}\, \Gamma(c - a + 1)}{\Gamma(2c - 2b + 1)} z^c {}_1F_1\left(c - a + 1; 2c - 2b + 1; -2\sqrt{z}\right) U\left(c - a + 1, 2c - 2b + 1, 2\sqrt{z}\right)$$

07.34.03.0994.01

$$G_{2,4}^{3,1}\left(z \,\middle|\, \begin{matrix} a, a + \frac{1}{2} \\ a - \frac{1}{4}, a + \frac{1}{4}, a, a - \frac{1}{2} \end{matrix}\right) = \sqrt{2}\, \pi z^{a-\frac{1}{2}} \operatorname{erfc}\left(\sqrt{2} \sqrt[4]{z}\right) \operatorname{erfi}\left(\sqrt{2} \sqrt[4]{z}\right)$$

Case $\{m, n, p, q\} = \{3, 1, 3, 3\}$

07.34.03.0995.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{array} \right.\right) = \Gamma(1-a_1+b_1)\,\Gamma(1-a_1+b_2)\,\Gamma(1-a_1+b_3)\,z^{a_1-1}\,{}_3\tilde{F}_2\left(1-a_1+b_1, 1-a_1+b_2, 1-a_1+b_3; 1-a_1+a_2, 1-a_1+a_3; -\frac{1}{z}\right)$$

07.34.03.0996.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b-1 \\ b, d, e \end{array} \right.\right) = \frac{(b-a)\,\Gamma(d-a+1)\,\Gamma(e-a+1)}{\Gamma(c-a+1)}\,z^{a-1} \left({}_2F_1\left(d-a+1, e-a+1; c-a+1; -\frac{1}{z}\right) - \frac{(d-a+1)\,(e-a+1)}{(b-a)\,(c-a+1)\,z}\,{}_2F_1\left(d-a+2, e-a+2; c-a+2; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.0997.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b-n \\ b, d, e \end{array} \right.\right) = \frac{(-1)^n\,\Gamma(d-a+1)\,\Gamma(e-a+1)}{\Gamma(c-a+1)}\,z^{1-a} \sum_{k=0}^{n} \binom{n}{k} \frac{(a-b)_{n-k}\,(d-a+1)_k\,(e-a+1)_k}{(c-a+1)_k}\,{}_2F_1(d-a+k+1, e-a+k+1; c-a+k+1; -z)\,z^k /; n \in \mathbb{N}^+$$

07.34.03.0998.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, a+1 \\ b, d, a \end{array} \right.\right) = \frac{\Gamma(b-a)\,\Gamma(d-a)}{\Gamma(c-a)}\,z^a \left(1 - {}_2F_1\left(b-a, d-a; c-a; -\frac{1}{z}\right)\right)$$

07.34.03.0999.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b+1 \\ b, d, c-1 \end{array} \right.\right) = \frac{z^{a-1}\,\Gamma(d-a+1)}{(b-a+1)\,(c-a)\,(c-b-1)} \left((c-a)\,{}_2F_1\left(b-a+1, d-a+1; b-a+2; -\frac{1}{z}\right) - (b-a+1)\,{}_2F_1\left(c-a, d-a+1; c-a+1; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.1000.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2d-a+b-c+2 \\ b, d, d+\frac{1}{2} \end{array} \right.\right) = \frac{2\sqrt{\pi}\,\Gamma(b-a+1)\,\Gamma(2d-2a+2)}{\Gamma(c-a+1)\,\Gamma(b-2a-c+2d+3)}\,z^d \left(\sqrt{z+1} - \sqrt{z}\right)^{2d-2a+2} {}_3F_2\left(c-b, 2d-2a+2, 2d-a-c+2; c-a+1, b-2a-c+2d+3; 2z-2\sqrt{z+1}\,\sqrt{z}+1\right) /; z \notin (-1, 0)$$

07.34.03.1001.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b-1 \\ b, 2b-c-1, 2b-a-1 \end{array} \right.\right) = \frac{\Gamma(2b-2a+1)\,\Gamma(2b-a-c)}{2\,\Gamma(c-a+1)}\,z^{a-2}\,(z+1)\,{}_2F_1\left(2b-2a+1, 2b-a-c+1; c-a+1; -\frac{1}{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.1002.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b-1 \\ b, 2b-c-1, 2b-a-1 \end{array} \right.\right) = -\frac{\Gamma(2b-2a+1)\,\Gamma(2b-a-c)}{2\,\Gamma(c-a+2)}\,z^{-a+4b-2c-1}\,(z+1)^{2a-4b+2c-1} \left((a-c-1)\,z\,{}_2F_1\left(a-2b+c-1, 2c-2b-1; c-a+1; -\frac{1}{z}\right) + 2\,(a-2b+c-1)\,{}_2F_1\left(a-2b+c, 2c-2b; c-a+2; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.1003.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b-1 \\ b, 2c-b-1, \frac{a+b}{2}-1 \end{array} \right.\right) = \frac{2\,\Gamma\left(\frac{b-a}{2}+1\right)\Gamma(2c-a-b)}{\Gamma(c-a+1)} z^{\frac{a-b}{2}+c-1} (z+1)^{\frac{a+b}{2}-c} {}_2F_1\left(c-\frac{a+b}{2}, b-c; c-a+1; -\frac{1}{z}\right) /; z \notin (-\infty, 0)$$

07.34.03.1004.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, b+2 \\ b, 2b-c+2, 2b-a+2 \end{array} \right.\right) = \frac{2\,\Gamma(2b-2a+2)\,\Gamma(2b-a-c+3)}{(b-a+2)\,\Gamma(c-a+1)} z^{2b-a+2} (z+1)^{2a-2b-3} {}_3F_2\left(b-a+\frac{3}{2}, b-a+2, c-b; b-a+3, c-a+1; \frac{4z}{(z+1)^2}\right) /; |z| > 1$$

07.34.03.1005.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2b-a \\ b, b-\frac{1}{2}, c-1 \end{array} \right.\right) = \frac{2^{a-2b+c}\sqrt{\pi}}{c-a} z^{\frac{a+c}{2}-1} \left(\sqrt{z}+\sqrt{z+1}\right)^{a-c} {}_2F_1\left(c-a, 2b-a-c+1; c-a+1; \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) /; z \notin (-1, 0)$$

07.34.03.1006.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2b-a+1 \\ b, b+\frac{1}{2}, c-1 \end{array} \right.\right) = \frac{2^{2c-2b-1}\sqrt{\pi}}{c-a} z^{c-1} \left(\sqrt{z+1}-\sqrt{z}\right)^{2c-2a} {}_2F_1\left(c-a, 2c-2b-1; c-a+1; 2z-2\sqrt{z+1}\,\sqrt{z}+1\right) /; z \notin (-1, 0)$$

07.34.03.1007.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2b-c+1 \\ b, \frac{a+c-1}{2}, b+\frac{a-c}{2} \end{array} \right.\right) = \frac{2\pi\,\Gamma(b-a+1)}{\Gamma\left(b+\frac{3-a-c}{2}\right)\Gamma\left(\frac{c-a}{2}+1\right)} z^b (4z+1)^{a-b-1} {}_3F_2\left(\frac{1-a+b}{3}, \frac{2-a+b}{3}, \frac{b-a}{3}+1; b+\frac{3-a-c}{2}, \frac{c-a}{2}+1; \frac{27z}{(4z+1)^3}\right)$$

07.34.03.1008.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a-1 \\ b, 2c-b-2, c-\frac{1}{2} \end{array} \right.\right) = -\frac{2^{2(a-c)}\sqrt{\pi}\, z^{a-1}\,\Gamma(b-a+1)\,\Gamma(2c-a-b-1)}{(a-c)(c-b-1)\,\Gamma(c-a)^2} \left((a-b-1)\, {}_2F_1\left(\frac{b-a}{2}+1, c-\frac{a+b+1}{2}; c-a; -\frac{1}{z}\right) {}_2F_1\left(\frac{b-a}{2}+1, c-\frac{a+b+1}{2}; c-a+1; -\frac{1}{z}\right) - (a+b-2c+1)\, {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; c-a; -\frac{1}{z}\right) {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; c-a+1; -\frac{1}{z}\right)\right)$$

07.34.03.1009.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a-1 \\ b, 2c-b-1, c-\frac{1}{2} \end{array} \right.\right) = -\frac{2^{2a-2c+1}(a-c)\sqrt{\pi}\,\Gamma(b-a+1)\,\Gamma(2c-a-b)}{\Gamma(c-a+1)^2} z^{a-1} {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; c-a; -\frac{1}{z}\right) {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; c-a+1; -\frac{1}{z}\right)$$

07.34.03.1010.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a-1 \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = \frac{\sqrt{\pi}\; \Gamma(b-a+1)\,\Gamma(2c-a-b)}{\sqrt{z+1}}\, z^{c-1}\, \mathfrak{P}_{c-b-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{P}_{c-b-1}^{a-c+1}\left(\sqrt{1+\frac{1}{z}}\right) /;\, z \notin (-1,0)$$

07.34.03.1011.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a-1 \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = \frac{\sqrt{2}\; (b-a)\, e^{i\left(c-b-\frac{1}{2}\right)\pi}\, \Gamma(2c-a-b)}{\sqrt{z+1}}\, z^{c-\frac{3}{4}}\, \mathfrak{P}_{b-c}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{c-a-\frac{3}{2}}^{b-c+\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,0)$$

07.34.03.1012.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a-1 \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = \frac{\sqrt{2}\; e^{i\left(c-b-\frac{1}{2}\right)\pi}\, \Gamma(2c-a-b)}{\sqrt{z+1}}\, z^{c-\frac{3}{4}}\, \mathfrak{P}_{b-c}^{a-c+1}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{b-c+\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,0)$$

07.34.03.1013.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a-1 \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = \frac{\sqrt{2}\; e^{i\left(b-c+\frac{1}{2}\right)\pi}\, \Gamma(b-a+1)}{\sqrt{z+1}}\, z^{c-\frac{3}{4}}\, \mathfrak{P}_{c-b-1}^{a-c+1}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,0)$$

07.34.03.1014.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a-1 \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = -\frac{2\, e^{2i(b-c)\pi}\, \Gamma(b-a+1)}{\sqrt{\pi}\; \Gamma(2c-a-b-1)\, \sqrt{z+1}}\, z^{c-\frac{1}{2}}\, \mathfrak{Q}_{c-a-\frac{3}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,0)$$

07.34.03.1015.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a-1 \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = -\frac{2\, e^{-2i(b-c)\pi}\, \Gamma(2c-a-b)}{\sqrt{\pi}\; \Gamma(b-a)\, \sqrt{z+1}}\, z^{c-\frac{1}{2}}\, \mathfrak{Q}_{c-a-\frac{3}{2}}^{b-c+\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{b-c+\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1,0)$$

07.34.03.1016.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a \\ b,\, 2c-b-2,\, c-\frac{1}{2} \end{array}\right) = -\frac{2^{2a-2c-1}\, \sqrt{\pi}\; \Gamma(b-a+1)\,\Gamma(2c-a-b-1)}{(b-c+1)\,\Gamma(c-a+1)^2}$$

$$z^{a-1}\left((a-b-1)\, {}_2F_1\left(\frac{b-a}{2}+1,\, c-\frac{a+b+1}{2};\, c-a+1;\, -\frac{1}{z}\right)^2 - (a+b-2c+1)\, {}_2F_1\left(\frac{b-a+1}{2},\, c-\frac{a+b}{2};\, c-a+1;\, -\frac{1}{z}\right)^2\right)$$

07.34.03.1017.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = \frac{4^{a-c}\, \sqrt{\pi}\; \Gamma(b-a+1)\,\Gamma(2c-a-b)}{\Gamma(c-a+1)^2}\, z^{a-1}\, {}_2F_1\left(\frac{b-a+1}{2},\, c-\frac{a+b}{2};\, c-a+1;\, -\frac{1}{z}\right)^2$$

07.34.03.1018.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) =$$

$$\frac{2^{2(a-c)}\, \sqrt{\pi}\; \Gamma(b-a+1)\,\Gamma(2c-a-b)}{\Gamma(c-a+1)^2}\, z^{a-1}\, {}_2F_1\left(b-a+1,\, 2c-a-b;\, c-a+1;\, \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right)^2 /;\, z \notin (-1,0)$$

07.34.03.1019.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2c-a \\ b,\, 2c-b-1,\, c-\frac{1}{2} \end{array}\right) = \frac{2^{2(a-c)}\, \sqrt{\pi}\; \Gamma(b-a+1)\,\Gamma(2c-a-b)}{\Gamma(c-a+1)^2}\, z^{a-\frac{3}{2}}\, \sqrt{z+1}$$

$${}_2F_1\left(\frac{b-a+1}{2},\, c-\frac{a+b}{2};\, c-a+1;\, -\frac{1}{z}\right) {}_2F_1\left(\frac{b-a}{2}+1,\, c+\frac{1-a-b}{2};\, c-a+1;\, -\frac{1}{z}\right) /;\, z \notin (-1,0)$$

07.34.03.1020.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b-1, c-\frac{1}{2} \end{array} \right.\right) = \sqrt{\pi}\, z^{c-1}\, \Gamma(b-a+1)\, \Gamma(2c-a-b)\, \mathfrak{P}_{c-b-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right)^2 /; z \notin (-1, 0)$$

07.34.03.1021.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b-1, c-\frac{1}{2} \end{array} \right.\right) = \sqrt{2}\, e^{i\left(c-b-\frac{1}{2}\right)\pi}\, z^{c-\frac{3}{4}}\, \Gamma(2c-a-b)\, \mathfrak{P}_{c-b-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{b-c+\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.1022.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b-1, c-\frac{1}{2} \end{array} \right.\right) = -\frac{2\, e^{2i(b-c)\pi}\, \Gamma(b-a+1)}{\sqrt{\pi}\, \Gamma(2c-a-b)}\, z^{c-\frac{1}{2}}\, \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right)^2 /; z \notin (-1, 0)$$

07.34.03.1023.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b-1, c+\frac{1}{2} \end{array} \right.\right) = \frac{2^{2a-2c-1}\sqrt{\pi}\, \Gamma(b-a+1)\, \Gamma(2c-a-b)}{\Gamma(c-a+1)^2}\, z^{a-1}\, {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; c-a+1; -\frac{1}{z}\right)$$
$$\left((2a-2c+1)\, {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; -a+c+1; -\frac{1}{z}\right) - 4(a-c)\, {}_2F_1\left(\frac{b-a+1}{2}, c-\frac{a+b}{2}; c-a; -\frac{1}{z}\right)\right)$$

07.34.03.1024.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b, c-\frac{1}{2} \end{array} \right.\right) = \frac{2^{2(a-c)}\sqrt{\pi}\, \Gamma(b-a+1)\, \Gamma(2c-a-b+1)}{\Gamma(c-a+1)^2}$$
$$z^{a-1}\, {}_2F_1\left(\frac{b-a}{2}, \frac{1-a-b}{2}+c; c-a+1; -\frac{1}{z}\right) {}_2F_1\left(\frac{b-a}{2}+1, \frac{1-a-b}{2}+c; c-a+1; -\frac{1}{z}\right)$$

07.34.03.1025.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b, c-\frac{1}{2} \end{array} \right.\right) = \frac{\sqrt{\pi}\, \Gamma(b-a+1)\, \Gamma(2c-a-b+1)}{\sqrt{z+1}}\, z^{c-\frac{1}{2}}\, \mathfrak{P}_{b-c}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{P}_{c-b}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) /; z \notin (-1, 0)$$

07.34.03.1026.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b, c-\frac{1}{2} \end{array} \right.\right) = \frac{\sqrt{2}\, (2c-a-b)\, e^{i\left(b-c+\frac{1}{2}\right)\pi}\, \Gamma(b-a+1)}{\sqrt{z+1}}\, z^{c-\frac{1}{4}}\, \mathfrak{P}_{c-b}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.1027.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a \\ b, 2c-b, c-\frac{1}{2} \end{array} \right.\right) = \frac{2\, e^{2i(b-c)\pi}\, \Gamma(b-a+1)}{\sqrt{\pi}\, \Gamma(2c-a-b)\sqrt{z+1}}\, z^{c}\, \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b-\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{c-b+\frac{1}{2}}\left(\sqrt{z+1}\right) /; z \notin (-1, 0)$$

07.34.03.1028.01

$$G_{3,3}^{3,1}\left(z \left| \begin{array}{c} a, c, 2c-a+2 \\ b, 2c-b+1, c+\frac{1}{2} \end{array} \right.\right) =$$
$$-\frac{2^{2(a-c-1)}\sqrt{\pi}\, \Gamma(b-a+1)\, \Gamma(2c-a-b+2)}{(c-a+1)\, \Gamma(c-a+1)^2}\, z^{a-1}\, {}_2F_1\left(\frac{b-a+1}{2}, c+1-\frac{a+b}{2}; c-a+2; -\frac{1}{z}\right)$$
$$\left({}_2F_1\left(\frac{b-a+1}{2}, c+1-\frac{a+b}{2}; c-a+2; -\frac{1}{z}\right) - 2\, {}_2F_1\left(\frac{b-a+1}{2}, c+1-\frac{a+b}{2}; c-a+1; -\frac{1}{z}\right)\right)$$

07.34.03.1029.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2a-c \\ b,\, 2a-b-1,\, a-\frac{1}{2} \end{array}\right) = \frac{\sqrt{\pi}\,\sin((a-c)\pi)\csc((a-b)\pi)}{a-c} z^{a-1}\, {}_2F_1\left(a-b,\, b-a+1;\, a-c+1;\, \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) {}_2F_1\left(a-b,\, b-a+1;\, c-a+1;\, \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.1030.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2a-c \\ b,\, 2a-b-1,\, a-\frac{1}{2} \end{array}\right) = \frac{\sqrt{\pi}\,\csc((a-b)\pi)\sin((c-a)\pi)}{c-a} z^{a-1}\, {}_2F_1\left(a-\frac{b+c}{2},\, \frac{1+b-c}{2};\, a-c+1;\, -\frac{1}{z}\right) {}_2F_1\left(\frac{1+b+c}{2}-a,\, \frac{c-b}{2};\, c-a+1;\, -\frac{1}{z}\right)$$

07.34.03.1031.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2a-c \\ b,\, 2a-b-1,\, a-\frac{1}{2} \end{array}\right) = \pi^{3/2} z^{a-1} \csc((a-b)\pi)\, \mathfrak{P}_{a-b-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{P}_{a-b-1}^{c-a}\left(\sqrt{1+\frac{1}{z}}\right)$$

07.34.03.1032.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2a-c \\ b,\, 2a-b-1,\, a-\frac{1}{2} \end{array}\right) = \frac{\sqrt{2}\, e^{i\left(b-a+\frac{1}{2}\right)\pi}\, \pi \csc((a-b)\pi)}{\Gamma(2a-b-c)} z^{a-\frac{3}{4}}\, \mathfrak{P}_{a-b-1}^{a-c}\left(\sqrt{1+\frac{1}{z}}\right) \mathfrak{Q}_{a-c-\frac{1}{2}}^{a-b-\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1, 0)$$

07.34.03.1033.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, c,\, 2a-c \\ b,\, 2a-b-1,\, a-\frac{1}{2} \end{array}\right) = \frac{2\, e^{i(2a-2b-1)\pi} \sqrt{\pi}\, \csc((a-b)\pi)}{\Gamma(b-c+1)\,\Gamma(b+c-2a+1)} z^{a-\frac{1}{2}}\, \mathfrak{Q}_{a-c-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\sqrt{z+1}\right) \mathfrak{Q}_{c-a-\frac{1}{2}}^{b-a+\frac{1}{2}}\left(\sqrt{z+1}\right) /;\, z \notin (-1, 0)$$

07.34.03.1034.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2},\, a-\frac{1}{2} \end{array}\right) = \frac{4}{\sqrt{\pi}} z^{a-1} K\left(\frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right)^2 /;\, z \notin (-1, 0)$$

07.34.03.1035.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, a,\, a \\ a-\frac{1}{2},\, a-\frac{1}{2},\, a-\frac{1}{2} \end{array}\right) = \frac{8}{\sqrt{\pi}\left(\sqrt{z+1}+\sqrt{z}\right)} z^{a-\frac{1}{2}} K\left(\left(\sqrt{z+1}-\sqrt{z}\right)^2\right)^2 /;\, z \notin (-1, 0)$$

07.34.03.1036.01

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

07.34.03.1037.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, a+\frac{1}{2},\, a+1 \\ a,\, a,\, a \end{array}\right) = \frac{2z^a}{\sqrt{\pi}} \log^2\left(\frac{\sqrt{z+1}+1}{\sqrt{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.1038.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, a+1,\, a+1 \\ a,\, a,\, a+\frac{1}{2} \end{array}\right) = 2\sqrt{\pi}\, z^a \log\left(\frac{\sqrt{z}+\sqrt{z+1}}{2\sqrt{z}}\right) /;\, z \notin (-1, 0)$$

07.34.03.1039.01

$$G_{3,3}^{3,1}\left(z \middle| \begin{array}{c} a,\, a+1,\, a+1 \\ a-\frac{1}{2},\, a,\, a+\frac{1}{2} \end{array}\right) = 2z^a\left(2E\left(-\frac{1}{z}\right)-\pi\right)$$

07.34.03.1040.01

$$G_{3,3}^{3,1}\left(-1 \middle| \begin{matrix} 1, 2, 2 \\ 1, 1, b \end{matrix}\right) = -\Gamma(b-1)\,(\psi(2-b)+\gamma)$$

07.34.03.1041.01

$$G_{3,3}^{3,1}\left(-1 \middle| \begin{matrix} 1, 2, 2 \\ 1, 1, b \end{matrix}\right) = -\Gamma(b-1)\, H_{1-b}$$

Case $\{m, n, p, q\} = \{3, 2, 2, 3\}$

07.34.03.1042.01

$$G_{2,3}^{3,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3 \end{matrix}\right) = \pi^2 \Big(\csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))\,\Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\, z^{b_1}\, {}_2\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1; b_1-b_2+1, b_1-b_3+1; -z) + \csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))\,\Gamma(1-a_1+b_2)\,\Gamma(1-a_2+b_2)\, z^{b_2}\, {}_2\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2; 1-b_1+b_2, b_2-b_3+1; -z) + \csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))\,\Gamma(1-a_1+b_3)\,\Gamma(1-a_2+b_3)\, z^{b_3}\, {}_2\tilde{F}_2(1-a_1+b_3, 1-a_2+b_3; 1-b_1+b_3, 1-b_2+b_3; -z)\Big) \;/;\; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{3, 2, 2, 4\}$

07.34.03.1043.01

$$G_{2,4}^{3,2}\left(z \middle| \begin{matrix} a_1, a_2 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) = \pi^2 \csc(\pi(b_2-b_1))\csc(\pi(b_3-b_1))\,\Gamma(-a_1+b_1+1)\,\Gamma(-a_2+b_1+1)\, z^{b_1}\, {}_2\tilde{F}_3(-a_1+b_1+1, -a_2+b_1+1; b_1-b_2+1, b_1-b_3+1, b_1-b_4+1; -z) + \pi^2 \csc(\pi(b_1-b_2))\csc(\pi(b_3-b_2))\,\Gamma(-a_1+b_2+1)\,\Gamma(-a_2+b_2+1)\, z^{b_2}\, {}_2\tilde{F}_3(-a_1+b_2+1, -a_2+b_2+1; -b_1+b_2+1, b_2-b_3+1, b_2-b_4+1; -z) + \pi^2 \csc(\pi(b_1-b_3))\csc(\pi(b_2-b_3))\,\Gamma(-a_1+b_3+1)\,\Gamma(-a_2+b_3+1)\, z^{b_3}\, {}_2\tilde{F}_3(-a_1+b_3+1, -a_2+b_3+1; -b_1+b_3+1, -b_2+b_3+1, b_3-b_4+1; -z) \;/;\; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

07.34.03.1044.01

$$G_{2,4}^{3,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, c, 2a-c, 2a-b \end{matrix}\right) = \pi^{5/2} \csc(2(a-c)\pi)\, z^a \left(J_{b-c}\left(\sqrt{z}\right) Y_{b+c-2a}\left(\sqrt{z}\right) - J_{b+c-2a}\left(\sqrt{z}\right) Y_{b-c}\left(\sqrt{z}\right)\right)$$

07.34.03.1045.01

$$G_{2,4}^{3,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, c, b+\frac{1}{2}, c-\frac{1}{2} \end{matrix}\right) = \frac{4^{a-b}\sqrt{\pi}\,\Gamma(2b-2a+1)\,\Gamma(2c-2a)}{\sqrt{-z}}\, z^c \left(U\left(2c-2a, 2c-2b, -2\sqrt{-z}\right) - U\left(2c-2a, 2c-2b, 2\sqrt{-z}\right)\right)$$

07.34.03.1046.01

$$G_{2,4}^{3,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, c, b+\frac{1}{2}, c+\frac{1}{2} \end{matrix}\right) = 4^{a-b}\sqrt{\pi}\, z^c\, \Gamma(2b-2a+1)\,\Gamma(2c-2a+1) \left(U\left(2c-2a+1, 2c-2b+1, -2\sqrt{-z}\right) + U\left(2c-2a+1, 2c-2b+1, 2\sqrt{-z}\right)\right)$$

07.34.03.1047.01

$$G_{2,4}^{3,2}\left(z \middle| \begin{matrix} a, a+\frac{1}{2} \\ b, b+\frac{1}{2}, 2a-b-\frac{1}{2}, 2a-b \end{matrix}\right) = -\sqrt{2}\,\pi^2 \csc(2(a-b)\pi)\, z^{a-\frac{1}{4}} \left(\cos\left(\sqrt{z}\right) Y_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) - \sin\left(\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.1048.01

$$G_{2,4}^{3,2}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, b+\frac{1}{2}, 2a-b, 2a-b-\frac{1}{2} \end{array} \right.\right) = \sqrt{2}\, \pi^2 \csc(2(a-b)\pi)\, z^{a-\frac{1}{4}} \left(\cos\left(\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) + \sin\left(\sqrt{z}\right) Y_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)\right)$$

07.34.03.1049.01

$$G_{2,4}^{3,2}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, a, a+\frac{1}{2}, b-\frac{1}{2} \end{array} \right.\right) = i\sqrt{\pi}\, z^{b-\frac{1}{2}}\, \Gamma(2b-2a) \left(e^{2\sqrt{-z}}\, \Gamma\left(2a-2b+1, 2\sqrt{-z}\right) - e^{-2\sqrt{-z}}\, \Gamma\left(2a-2b+1, -2\sqrt{-z}\right)\right) /; \operatorname{Re}(z) < 0$$

07.34.03.1050.01

$$G_{2,4}^{3,2}\left(z \left| \begin{array}{c} a, a+\frac{1}{2} \\ b, a, a+\frac{1}{2}, b+\frac{1}{2} \end{array} \right.\right) = \sqrt{\pi}\, z^b\, \Gamma(2b-2a+1) \left(e^{-2\sqrt{-z}}\, \Gamma\left(2(a-b), -2\sqrt{-z}\right) + e^{2\sqrt{-z}}\, \Gamma\left(2(a-b), 2\sqrt{-z}\right)\right)$$

Case $\{m, n, p, q\} = \{3, 2, 3, 3\}$

07.34.03.1051.01

$$G_{3,3}^{3,2}\left(z \left| \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{array} \right.\right) = \pi \csc(\pi(a_1-a_2)) \left(\Gamma(1-a_1+b_1)\,\Gamma(1-a_1+b_2)\,\Gamma(1-a_1+b_3)\, z^{a_1-1}\, {}_3\tilde{F}_2\left(1-a_1+b_1, 1-a_1+b_2, 1-a_1+b_3; 1-a_1+a_2, 1-a_1+a_3; \frac{1}{z}\right) - \Gamma(1-a_2+b_1)\,\Gamma(1-a_2+b_2)\,\Gamma(1-a_2+b_3)\, z^{a_2-1}\, {}_3\tilde{F}_2\left(1-a_2+b_1, 1-a_2+b_2, 1-a_2+b_3; a_1-a_2+1, 1-a_2+a_3; \frac{1}{z}\right)\right) /; a_2-a_1 \notin \mathbb{Z}$$

Case $\{m, n, p, q\} = \{3, 3, 3, 3\}$

07.34.03.1052.01

$$G_{3,3}^{3,3}\left(z \left| \begin{array}{c} a_1, a_2, a_3 \\ b_1, b_2, b_3 \end{array} \right.\right) = \pi^2 \left(\csc(\pi(b_2-b_1)) \csc(\pi(b_3-b_1))\, \Gamma(1-a_1+b_1)\,\Gamma(1-a_2+b_1)\,\Gamma(1-a_3+b_1)\, z^{b_1}\, {}_3\tilde{F}_2(1-a_1+b_1, 1-a_2+b_1, 1-a_3+b_1; b_1-b_2+1, b_1-b_3+1; -z) + \csc(\pi(b_1-b_2)) \csc(\pi(b_3-b_2))\, \Gamma(1-a_1+b_2)\, \Gamma(1-a_2+b_2)\,\Gamma(1-a_3+b_2)\, z^{b_2}\, {}_3\tilde{F}_2(1-a_1+b_2, 1-a_2+b_2, 1-a_3+b_2; 1-b_1+b_2, b_2-b_3+1; -z) + \csc(\pi(b_1-b_3)) \csc(\pi(b_2-b_3))\, \Gamma(1-a_1+b_3)\,\Gamma(1-a_2+b_3)\,\Gamma(1-a_3+b_3)\, z^{b_3}\, {}_3\tilde{F}_2(1-a_1+b_3, 1-a_2+b_3, 1-a_3+b_3; 1-b_1+b_3, 1-b_2+b_3; -z)\right) /; b_2-b_1 \notin \mathbb{Z} \land b_3-b_1 \notin \mathbb{Z} \land b_3-b_2 \notin \mathbb{Z}$$

07.34.03.1053.01

$$G_{3,3}^{3,3}\left(z \left| \begin{array}{c} a, a, a \\ a, a, a \end{array} \right.\right) = \frac{z^a \left(\log^2(z) + \pi^2\right)}{2(z+1)}$$

Case $\{m, n, p, q\} = \{3, 3, 4, 4\}$

07.34.03.1114.01

$$G_{4,4}^{3,3}\left(z \middle| \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) = \pi^2 \left(\frac{1}{\Gamma(a_4 - b_1)} \left(z^{b_1} \csc(\pi (b_2 - b_1)) \csc(\pi (b_3 - b_1)) \Gamma(-a_1 + b_1 + 1) \Gamma(-a_2 + b_1 + 1) \Gamma(-a_3 + b_1 + 1) \, {}_4\tilde{F}_3(-a_1 + b_1 + 1, -a_2 + b_1 + 1, -a_3 + b_1 + 1, -a_4 + b_1 + 1; b_1 - b_2 + 1, b_1 - b_3 + 1, b_1 - b_4 + 1; z)\right) + \frac{1}{\Gamma(a_4 - b_2)} \left(z^{b_2} \csc(\pi (b_1 - b_2)) \csc(\pi (b_3 - b_2)) \Gamma(-a_1 + b_2 + 1) \Gamma(-a_2 + b_2 + 1) \Gamma(-a_3 + b_2 + 1) \, {}_4\tilde{F}_3(-a_1 + b_2 + 1, -a_2 + b_2 + 1, -a_3 + b_2 + 1, -a_4 + b_2 + 1; -b_1 + b_2 + 1, b_2 - b_3 + 1, b_2 - b_4 + 1; z)\right) + \frac{1}{\Gamma(a_4 - b_3)} \left(z^{b_3} \csc(\pi (b_1 - b_3)) \csc(\pi (b_2 - b_3)) \Gamma(-a_1 + b_3 + 1) \Gamma(-a_2 + b_3 + 1) \Gamma(-a_3 + b_3 + 1) \, {}_4\tilde{F}_3(-a_1 + b_3 + 1, -a_2 + b_3 + 1, -a_3 + b_3 + 1, -a_4 + b_3 + 1; -b_1 + b_3 + 1, -b_2 + b_3 + 1, b_3 - b_4 + 1; z)\right)\right) /; b_2 - b_1 \notin \mathbb{Z} \land b_3 - b_1 \notin \mathbb{Z} \land b_3 - b_2 \notin \mathbb{Z}$$

07.34.03.1115.01

$$G_{4,4}^{3,3}\left(z \middle| \begin{matrix} a, a, a, a + \frac{1}{2} \\ a, a, a, a + \frac{1}{2} \end{matrix}\right) = \frac{z^a \log^2(z)}{2 \pi (1 - z)}$$

Cases with $m = 4$

Case $\{m, n, p, q\} = \{4, 0, 0, 4\}$

07.34.03.1054.01

$$G_{0,4}^{4,0}\left(z \middle| b, b + \frac{1}{2}, 2 b - c, c\right) = 8 \sqrt{\pi} \, z^b K_{2c-2b}\left(2 \sqrt{2} \sqrt[4]{-z}\right) K_{2c-2b}\left(\frac{2 \sqrt{2} \sqrt{z}}{\sqrt[4]{-z}}\right)$$

07.34.03.1116.01

$$G_{0,4}^{4,0}\left(z \middle| b, b + \frac{1}{4}, b + \frac{1}{2}, b + \frac{3}{4}\right) = \sqrt{2} \, \pi^{3/2} z^b e^{-4 \sqrt[4]{z}}$$

Case $\{m, n, p, q\} = \{4, 0, 1, 5\}$

07.34.03.1055.01

$$G_{1,5}^{4,0}\left(z \middle| \begin{matrix} a \\ b, b + \frac{1}{2}, -a + 2 b + \frac{1}{2}, a - \frac{1}{2}, a \end{matrix}\right) = -4 \sqrt{\pi} \, z^b K_{2b-2a+1}\left(2 \sqrt{2} \sqrt[4]{z}\right) Y_{2b-2a+1}\left(2 \sqrt{2} \sqrt[4]{z}\right)$$

Case $\{m, n, p, q\} = \{4, 0, 2, 4\}$

07.34.03.1056.01

$$G_{2,4}^{4,0}\left(z \middle| \begin{matrix} a, c \\ b, \frac{a+c-1}{2}, \frac{a+c}{2}, a - b + c - 1 \end{matrix}\right) = 2^{a-2b+c} \sqrt{\pi} \, z^{a-b+c-1} e^{-2\sqrt{z}} \, U\left(a - b, a - 2 b + c, 2 \sqrt{z}\right) U\left(c - b, a - 2 b + c, 2 \sqrt{z}\right)$$

07.34.03.1057.01

$$G_{2,4}^{4,0}\left(z \middle| \begin{matrix} a, c \\ b, \frac{a+c-1}{2}, \frac{a+c}{2}, a - b + c - 1 \end{matrix}\right) = 2^{2b-a-c+2} \sqrt{\pi} \, e^{-2\sqrt{z}} z^b \, U\left(b - a + 1, 2 b - a - c + 2, 2 \sqrt{z}\right) U\left(b - c + 1, 2 b - a - c + 2, 2 \sqrt{z}\right)$$

07.34.03.1058.01

$$G_{2,4}^{4,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ b,\, c,\, 2a-c,\, 2a-b \end{matrix}\right) = \frac{2z^a}{\sqrt{\pi}} K_{b-c}\left(\sqrt{z}\right) K_{b+c-2a}\left(\sqrt{z}\right)$$

Case $\{m, n, p, q\} = \{4, 0, 3, 5\}$

07.34.03.1059.01

$$G_{3,5}^{4,0}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, 2a-b+\frac{1}{2} \\ b,\, c,\, 2a-c,\, 2a-b,\, 2a-b+\frac{1}{2} \end{matrix}\right) = \frac{\sqrt{\pi}}{2} z^a \left(Y_{b-c}\left(\sqrt{z}\right) Y_{b+c-2a}\left(\sqrt{z}\right) - J_{b-c}\left(\sqrt{z}\right) J_{b+c-2a}\left(\sqrt{z}\right)\right)$$

Case $\{m, n, p, q\} = \{4, 1, 2, 4\}$

07.34.03.1060.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, c \\ b,\, \frac{a+c-1}{2},\, \frac{a+c}{2},\, a-b+c-1 \end{matrix}\right) =$$
$$2^{a-2b+c} \sqrt{\pi}\, z^{a-b+c-1}\, \Gamma(b-a+1)\, \Gamma(c-b)\, U\left(c-b,\, a-2b+c,\, -2i\sqrt{z}\right) U\left(c-b,\, a-2b+c,\, 2i\sqrt{z}\right)$$

07.34.03.1061.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, b+1 \\ b,\, a,\, \frac{a+b}{2},\, \frac{a+b+1}{2} \end{matrix}\right) = 2^{b-a+1} \sqrt{\pi}\, \Gamma(b-a+1)\, z^b\, \Gamma\left(a-b,\, -2\sqrt{-z}\right) \Gamma\left(a-b,\, 2\sqrt{-z}\right)$$

07.34.03.1062.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a \\ b,\, a,\, b-\frac{1}{2},\, -a+2b-1 \end{matrix}\right) = 4^{a-b+1} \sqrt{\pi}\, \Gamma(2b-2a)\, z^a\, E_{2b-2a}\left(-2\sqrt{-z}\right) E_{2b-2a}\left(2\sqrt{-z}\right)$$

07.34.03.1117.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, 2b-a \\ a,\, b-\frac{1}{2},\, b,\, -a+2b-1 \end{matrix}\right) = 4^{a-b+1} \sqrt{\pi}\, z^a\, E_{2b-2a}\left(-2i\sqrt{z}\right) E_{2b-2a}\left(2i\sqrt{z}\right) \Gamma(2b-2a)$$

07.34.03.1063.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{2},\, a-\frac{1}{4},\, a,\, a+\frac{1}{4} \end{matrix}\right) = \pi^2\, 2^{3/2}\, z^{a-\frac{1}{2}} \left(\left(\frac{1}{2} - C\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)^2 + \left(\frac{1}{2} - S\left(\frac{2\sqrt[4]{z}}{\sqrt{\pi}}\right)\right)^2\right)$$

07.34.03.1064.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2} \\ a-\frac{1}{2},\, a-\frac{1}{4},\, a,\, a+\frac{1}{4} \end{matrix}\right) = \sqrt{2}\, \pi^2\, z^{a-\frac{1}{2}}\, \mathrm{erfc}\left(\sqrt{2}\, \sqrt[4]{-z}\right) \left(1 - \frac{\sqrt{-\sqrt{-z}}}{\sqrt[4]{-z}}\, \mathrm{erfi}\left(\sqrt{2}\, \sqrt[4]{-z}\right)\right)$$

07.34.03.1065.01

$$G_{2,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a,\, a+1 \\ a,\, a,\, a,\, a+\frac{1}{2} \end{matrix}\right) = 2\sqrt{\pi}\, z^a \left(\left(\mathrm{Si}\left(2\sqrt{z}\right) - \frac{\pi}{2}\right)^2 + \mathrm{Ci}\left(2\sqrt{z}\right)^2\right)$$

Case $\{m, n, p, q\} = \{4, 1, 4, 4\}$

07.34.03.1066.01

$$G_{4,4}^{4,1}\left(z \middle| \begin{matrix} a, c, d, e \\ b, f, c-1, d-1 \end{matrix}\right) = \frac{z^{a-1}\,\Gamma(b-a+1)\,\Gamma(f-a+1)}{(a-c)\,(a-d)\,(d-c)\,\Gamma(e-a+2)} \left((a-d)\,(c-e-1)\,{}_3F_2\!\left(b-a+1, c-a, f-a+1; c-a+1, e-a+2; -\frac{1}{z}\right) + (a-c)\,(e-d+1)\,{}_3F_2\!\left(b-a+1, d-a, f-a+1; d-a+1, e-a+2; -\frac{1}{z}\right)\right) /; z \notin (-\infty, 0)$$

07.34.03.1067.01

$$G_{4,4}^{4,1}\left(z \middle| \begin{matrix} a, c, d, e \\ b, c-1, d-1, e-1 \end{matrix}\right) = z^{a-1}\,\Gamma(b-a+1)\left(\frac{{}_2F_1\!\left(c-a, b-a+1; c-a+1; -\frac{1}{z}\right)}{(c-a)\,(d-c)\,(e-c)} + \frac{{}_2F_1\!\left(d-a, b-a+1; d-a+1; -\frac{1}{z}\right)}{(c-d)\,(d-a)\,(e-d)} + \frac{{}_2F_1\!\left(e-a, b-a+1; e-a+1; -\frac{1}{z}\right)}{(c-e)\,(d-e)\,(e-a)}\right) /; z \notin (-\infty, 0)$$

07.34.03.1068.01

$$G_{4,4}^{4,1}\left(z \middle| \begin{matrix} a, c, d, a-c+d \\ b, a-b+d-1, \frac{a+d-1}{2}, \frac{a+d}{2} \end{matrix}\right) = \frac{2^{a-d}\sqrt{\pi}\,\Gamma(b-a+1)\,\Gamma(d-b)}{\Gamma(c-a+1)\,\Gamma(d-c+1)}\, z^{a-1}\, {}_2F_1\!\left(b-a+1, d-b; c-a+1; \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) {}_2F_1\!\left(b-a+1, d-b; d-c+1; \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) /; z \notin (-\infty, 0)$$

07.34.03.1069.01

$$G_{4,4}^{4,1}\left(z \middle| \begin{matrix} a, c, d, b-1 \\ b, 2b-d-1, 2b-c-1, 2b-a-1 \end{matrix}\right) = \frac{\Gamma(2b-2a+1)\,\Gamma(2b-a-c)\,\Gamma(2b-a-d)}{2\,\Gamma(c-a+1)\,\Gamma(d-a+1)}\,(z-1)\,z^{2b-a-1}\,(z+1)^{2a-2b-1}\,{}_3F_2\!\left(b-a+\frac{1}{2}, b-a+1, c+d-2b+1; c-a+1, d-a+1; \frac{4z}{(z+1)^2}\right) /; |z| > 1 \land \notin (-\infty, -1)$$

07.34.03.1070.01

$$G_{4,4}^{4,1}\left(z \middle| \begin{matrix} a, c, \frac{a+c-1}{2}, \frac{a+c}{2} \\ b, d, a-b+c-1, a+c-d-1 \end{matrix}\right) = \frac{2^{c-a}\,\Gamma(b-a+1)\,\Gamma(c-b)\,\Gamma(c-d)\,\Gamma(d-a+1)}{\sqrt{\pi}\,\Gamma(c-a+1)^2}\, z^{a-1}\, {}_2F_1\!\left(b-a+1, d-a+1; c-a+1; \frac{2\left(\sqrt{z+1}-1\right)}{z}\right) {}_2F_1\!\left(b-a+1, d-a+1; c-a+1; -\frac{2\left(\sqrt{z+1}+1\right)}{z}\right) /; z \notin (-\infty, -1)$$

07.34.03.1071.01

$$G_{4,4}^{4,1}\left(z \middle| \begin{matrix} a, c, c+\frac{1}{2}, 2c-a+1 \\ b, d, 2c-b, 2c-d \end{matrix}\right) = \frac{2^{2c-2a+1}\,\Gamma(b-a+1)\,\Gamma(2c-a-b+1)\,\Gamma(2c-a-d+1)\,\Gamma(d-a+1)}{\sqrt{\pi}\,\Gamma(2c-2a+2)^2}\, z^{a-1} \left(-2\sqrt{-1-\frac{1}{z}}\,\sqrt{-\frac{1}{z}} + \frac{2}{z} + 1\right)^{b-a+1} {}_2F_1\!\left(b-a+1, 2c-a-d+1; 2c-2a+2; 2\sqrt{-1-\frac{1}{z}}\,\sqrt{-\frac{1}{z}} - \frac{2}{z}\right) {}_2F_1\!\left(b-a+1, d-a+1; 2c-2a+2; 2\sqrt{-1-\frac{1}{z}}\,\sqrt{-\frac{1}{z}} - \frac{2}{z}\right)$$

07.34.03.1072.01

$$G_{4,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a, c, c+\frac{1}{2}, a-\frac{1}{2} \\ b, d, b+\frac{1}{2}, d+\frac{1}{2} \end{matrix}\right) = \frac{4^{a-b+c-d-1}\,\Gamma(2b-2a+2)\,\Gamma(2d-2a+2)}{\Gamma(2c-2a+2)} z^{a-1} \left({}_2F_1\left(2b-2a+2, 2d-2a+2; 2c-2a+2; \frac{1}{\sqrt{-z}}\right) + {}_2F_1\left(2b-2a+2, 2d-2a+2; 2c-2a+2; -\frac{1}{\sqrt{-z}}\right)\right)$$

07.34.03.1073.01

$$G_{4,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a, c, c+\frac{1}{2}, a+\frac{1}{2} \\ b, d, b+\frac{1}{2}, d+\frac{1}{2} \end{matrix}\right) = \frac{2^{2a-2b+2c-2d-1}\,\Gamma(2b-2a+1)\,\Gamma(2d-2a+1)}{\Gamma(2c-2a+1)} \sqrt{-z}\, z^{a-1} \left({}_2F_1\left(2b-2a+1, 2d-2a+1; 2c-2a+1; \frac{1}{\sqrt{-z}}\right) - {}_2F_1\left(2b-2a+1, 2d-2a+1; 2c-2a+1; -\frac{1}{\sqrt{-z}}\right)\right)$$

07.34.03.1074.01

$$G_{4,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a, c, 2b-a+\frac{3}{2}, 2b-c+\frac{3}{2} \\ b, b+\frac{1}{4}, b+\frac{1}{2}, b+\frac{3}{4} \end{matrix}\right) = \frac{2^{4a-4b-\frac{5}{2}}\,\pi\,\Gamma(2b-2a+2)}{\Gamma\left(2b-a-c+\frac{5}{2}\right)\Gamma(c-a+1)} z^{a-1}\, {}_2F_1\left(b-a+1, b-a+\frac{3}{2}; 2b-a-c+\frac{5}{2}; \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) {}_2F_1\left(b-a+1, b-a+\frac{3}{2}; c-a+1; \frac{\sqrt{z}-\sqrt{z+1}}{2\sqrt{z}}\right) /;\ \notin (-\infty, 0)$$

07.34.03.1075.01

$$G_{4,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a, c, \frac{a+2b-3}{3}, 2b-c+1 \\ b, \frac{a+c-1}{2}, \frac{a+2b-3}{3}, \frac{a-c}{2}+b \end{matrix}\right) = \frac{2\pi\,\Gamma(b-a+1)}{\Gamma\left(b+\frac{3-a-c}{2}\right)\Gamma\left(\frac{c-a}{2}+1\right)} z^b (4z+1)^{a-b-1}\, {}_3F_2\left(\frac{1-a+b}{3}, \frac{2-a+b}{3}, \frac{b-a}{3}+1; b+\frac{3-a-c}{2}, \frac{c-a}{2}+1; \frac{27z}{(4z+1)^3}\right)$$

07.34.03.1076.01

$$G_{4,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a, c, \frac{a+2b-1}{3}, 2b-c+1 \\ b, \frac{a+c-1}{2}, \frac{a+2b+2}{3}, \frac{a-c}{2}+b \end{matrix}\right) = \frac{2\pi\,\Gamma(b-a+2)}{3\,\Gamma\left(b+\frac{3-a-c}{2}\right)\Gamma\left(\frac{c-a}{2}+1\right)} z^b (8z-1)(4z+1)^{a-b-2}\, {}_3F_2\left(\frac{2+b-a}{3}, \frac{b-a}{3}+1, \frac{4+b-a}{3}; b+\frac{3-a-c}{2}, \frac{c-a}{2}+1; \frac{27z}{(4z+1)^3}\right)$$

07.34.03.1077.01

$$G_{4,4}^{4,1}\left(z \,\middle|\, \begin{matrix} a, a, a, a-\frac{1}{2} \\ b, b+\frac{1}{2}, 2a-b-\frac{3}{2}, 2a-b-1 \end{matrix}\right) = 2\pi^{3/2} z^{a-1} \csc(2(b-a)\pi)\, P_{2(a-b-1)}\left(\frac{\sqrt{z+1}-1}{\sqrt{z}}\right) P_{2(a-b-1)}\left(\frac{\sqrt{z+1}+1}{\sqrt{z}}\right) /;\ z \notin (-\infty, 0)$$

Case $\{m, n, p, q\} = \{4, 2, 3, 5\}$

07.34.03.1078.01

$$G_{3,5}^{4,2}\left(z \,\middle|\, \begin{matrix} a,\, a+\frac{1}{2},\, c \\ b,\, b+\frac{1}{2},\, 2a-b-\frac{1}{2},\, 2a-b,\, c \end{matrix}\right) = \sqrt{2}\,\pi^2 z^{a-\frac{1}{4}} \csc(2(a-b)\pi)\left(\sin\left(\pi(2a-b-c)+\sqrt{z}\right) J_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right) - \cos\left(\pi(2a-b-c)+\sqrt{z}\right) Y_{2b-2a+\frac{1}{2}}\left(\sqrt{z}\right)\right)$$

Cases with $m = 5$

Case $\{m, n, p, q\} = \{5, 0, 0, 6\}$

07.34.03.1079.01

$$G_{0,6}^{5,0}\left(z \,\middle|\, a,\, a+\frac{1}{6},\, a+\frac{1}{3},\, a+\frac{1}{2},\, a+\frac{2}{3},\, a-\frac{1}{6}\right) = \frac{4\pi^{3/2} z^{a-\frac{1}{6}}}{\sqrt{3}} \exp\left(-3^{3/2}\sqrt[6]{z}\right)\sin\left(3\sqrt[6]{z}\right)$$

07.34.03.1080.01

$$G_{0,6}^{5,0}\left(z \,\middle|\, a,\, a+\frac{1}{6},\, a+\frac{1}{3},\, a+\frac{2}{3},\, a+\frac{5}{6},\, a+\frac{1}{2}\right) = \frac{4\pi^{3/2} z^{a}}{\sqrt{3}} \exp\left(-3^{3/2}\sqrt[6]{z}\right)\cos\left(3\sqrt[6]{z}\right)$$

07.34.03.1111.01

$$G_{0,5}^{5,0}\left(z \,\middle|\, a,\, a+\frac{1}{5},\, a+\frac{2}{5},\, a+\frac{3}{5},\, a+\frac{4}{5}\right) = \frac{\left(4\pi^2 z^a\right) e^{-5\sqrt[5]{z}}}{\sqrt{5}}$$

General characteristics

Domain and analyticity

$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$ is an analytical function of $a_1, \ldots, a_p, b_1, \ldots, b_q$ and z which is defined in $\mathbb{C}^{p+q+1}$. In the case $p = q = m + n$this function with respect to z is piecewise analytical function with discontinuity on unit circle $|z| = 1$(it is continuos in the point $z = 1$ if $\mathrm{Re}\left(\sum_{k=1}^{q} b_k - \sum_{k=1}^{p} a_k\right) + 1 < 0$).

07.34.04.0001.01

$$\left(\left\{\{a_1 * \ldots * a_n\} * \{a_{n+1} * \ldots * a_p\}\right\} * \left\{\{b_1 * \ldots * b_m\} * \{b_{m+1} * \ldots * b_q\}\right\} * z\right) \longrightarrow G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) :: (\{\{\mathbb{C} \otimes \ldots \otimes \mathbb{C}\} \otimes \{\mathbb{C} \otimes \ldots \otimes \mathbb{C}\}\} \otimes \{\{\mathbb{C} \otimes \ldots \otimes \mathbb{C}\} \otimes \{\mathbb{C} \otimes \ldots \otimes \mathbb{C}\}\} \otimes \mathbb{C}) \longrightarrow \mathbb{C}$$

Symmetries and periodicities

Permutation symmetry

07.34.04.0002.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_k, \ldots, a_j, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_j, \ldots, a_k, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /; a_k \neq a_j \bigwedge k \neq j$$

07.34.04.0003.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_k, \ldots, a_j, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_j, \ldots, a_k, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /; a_k \neq a_j \bigwedge k \neq j$$

07.34.04.0004.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_k, \ldots, b_j, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_j, \ldots, a_k, \ldots, a_p \\ b_1, \ldots, b_j, \ldots, b_k, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /; b_k \neq b_j \wedge k \neq j$$

07.34.04.0005.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_k, \ldots, b_j, \ldots, b_q \end{matrix}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_j, \ldots, a_k, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_j, \ldots, b_k, \ldots, b_q \end{matrix}\right) /; b_k \neq b_j \wedge k \neq j$$

Periodicity

No periodicity

Branch points

The function $G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$ has two ($z == 0, \infty$ for $p \neq q$) or three ($z == 0, (-1)^{m+n-p}, \infty$, for $p == q$) singular points. If $p < q$ (or $p > q$), then the point $z == 0$ (or $z == \infty$) is a regular singular point, while $z == \infty$ (or $z == 0$) is a non-regular (essentual) singular point; if $p == q$, then all three singular points are regular.

Branch cuts

The existence of the branch cut depends on the parameters of `MeijerG.` If the branch cut exists, it will be along $(-\infty, 0)$ (or sometimes $(-\infty, -1)$ or $(-1, 0)$). For example, the function $G_{1,1}^{1,1}\left(z \,\middle|\, \begin{matrix} a \\ b \end{matrix}\right) == \Gamma(1-a+b)\, z^b\, (z+1)^{a-b-1}$ has branch cut along $(-\infty, 0)$ if $b \notin \mathbb{Z}$ and $b - a \notin \mathbb{Z}$; in the case $b \in \mathbb{Z}$ it generically has branch cut along $(-\infty, -1)$.

If $b_j \notin \mathbb{Z}$, $1 \leq j \leq m$, and $a_j \notin \mathbb{Z}$, $1 \leq j \leq n$, the branch cut along $(-\infty, 0)$ exists because it is produced by power functions $z^{b_j}$and z^{a_j-1}. In these cases the Meijer G function $G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$ is a single-valued function on the z-plane cut along the interval $(-\infty, 0)$, where it is continuous from above.

07.34.04.0006.01

$$\mathcal{BC}_z\left(G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)\right) == \{\{(-\infty, 0), -i\}\}$$

07.34.04.0007.01

$$\lim_{\epsilon \to +0} G_{p,q}^{m,n}\left(x + i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == G_{p,q}^{m,n}\left(x \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /; x < 0$$

07.34.04.0012.01

$$\lim_{\epsilon \to +0} G_{p,q}^{m,n}\left(x - i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == G_{q,p}^{n,m}\left(\frac{1}{x} \,\middle|\, \begin{matrix} 1-b_1, \ldots, 1-b_m, 1-b_{m+1}, \ldots, 1-b_q \\ 1-a_1, \ldots, 1-a_n, 1-a_{n+1}, \ldots, 1-a_p \end{matrix}\right) /; x < 0$$

07.34.04.0013.01

$$\lim_{\epsilon\to+0} G_{p,q}^{m,n}\left(x - i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{m} \frac{\left(\prod_{\substack{j=1\\ j\neq k}}^{m} \Gamma(b_j - b_k)\right) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} x^{b_k} e^{-2 b_k \pi i}$$

$${}_pF_{q-1}\left(1 - a_1 + b_k, \ldots, 1 - a_p + b_k; 1 - b_1 + b_k, \ldots, 1 - b_{k-1} + b_k, 1 - b_{k+1} + b_k, \ldots, 1 - b_q + b_k; (-1)^{p-m-n} x\right) /;$$
$$(p < q \lor p = q \land m + n > p \lor p = q \land m + n = p \land |x| < 1) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\le j\le m\land 1\le k\le m} \left(b_j - b_k \notin \mathbb{Z}\right) \land x < 0$$

07.34.04.0014.01

$$\lim_{\epsilon\to+0} G_{p,q}^{m,n}\left(x - i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{n} \frac{\left(\prod_{\substack{j=1\\ j\neq k}}^{n} \Gamma(a_k - a_j)\right) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(1 - a_k + a_j)} x^{a_k - 1} e^{-2 a_k \pi i}$$

$${}_qF_{p-1}\left(1 - a_k + b_1, \ldots, 1 - a_k + b_q; 1 - a_k + a_1, \ldots, 1 - a_k + a_{k-1}, 1 - a_k + a_{k+1}, \ldots, 1 - a_k + a_p; \frac{(-1)^{q-m-n}}{x}\right) /;$$
$$(p > q \lor p = q \land m + n = p + 1 \land x \notin (-1, 0) \lor p = q \land m + n > p + 1 \lor p = q \land m + n = p \land |x| > 1) \land$$
$$\forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\le j\le n\land 1\le k\le n} \left(a_j - a_k \notin \mathbb{Z}\right) \land x < 0$$

07.34.04.0008.02

$$\lim_{\epsilon\to+0} G_{p,q}^{m,n}\left(x - i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \pi^{m-1} \sum_{k=1}^{m} \frac{\prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{\substack{j=1\\ j\neq k}}^{m} \sin(\pi (b_j - b_k)) \prod_{j=n+1}^{p} \Gamma(a_j - b_k)} e^{-2 i \pi b_k} x^{b_k}$$

$${}_p\tilde{F}_{q-1}\left(1 - a_1 + b_k, \ldots, 1 - a_p + b_k; 1 - b_1 + b_k, \ldots, 1 - b_{k-1} + b_k, 1 - b_{k+1} + b_k, \ldots, 1 - b_q + b_k; (-1)^{p-m-n} x\right) /;$$
$$(p < q \lor p = q \land m + n > p \lor p = q \land m + n = p \land |z| < 1) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\le j\le m\land 1\le k\le m} \left(b_j - b_k \notin \mathbb{Z}\right) \land x < 0$$

07.34.04.0009.02

$$\lim_{\epsilon\to+0} G_{p,q}^{m,n}\left(x - i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{n} \frac{\prod_{\substack{j=1\\ j\neq k}}^{n} \Gamma(a_k - a_j) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(a_j - a_k + 1)} e^{-2 i \pi a_k} x^{a_k - 1}$$

$${}_qF_{p-1}\left(1 - a_k + b_1, \ldots, 1 - a_k + b_q; 1 + a_1 - a_k, \ldots, 1 + a_{k-1} - a_k, 1 + a_{k+1} - a_k, \ldots, 1 + a_p - a_k; \frac{(-1)^{q-m-n}}{x}\right) /;$$
$$(p > q \lor p = q \land m + n = p + 1 \land x \notin (-1, 0) \lor p = q \land m + n > p + 1 \lor p = q \land m + n = p \land |x| > 1) \land$$
$$\forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\le j\le n\land 1\le k\le n} \left(a_j - a_k \notin \mathbb{Z}\right) \land x < 0$$

If $p = q$ the branch cuts can appear not only from functions z^{b_j}or z^{a_j-1}but from other generalized hypergeometric factors in expansions of MeijerG function $G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$. In these cases the behaviour is more complicated.

07.34.04.0011.01

$$\lim_{\epsilon\to+0} G_{p,p}^{m,n}\left(x - i\,\epsilon \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_p \end{matrix}\right) = \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{n} \Gamma(a_k - a_j) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{p} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(a_j - a_k + 1)} e^{-2 i \pi a_k} x^{a_k - 1}$$
$${}_pF_{p-1}\left(1 - a_k + b_1, \ldots, 1 - a_k + b_q; 1 + a_1 - a_k, \ldots, 1 + a_{k-1} - a_k, 1 + a_{k+1} - a_k, \ldots, 1 + a_p - a_k; \frac{(-1)^{p-m-n}}{x}\right) \theta(|x| - 1) +$$
$$\pi^{m-1} \sum_{k=1}^{m} \frac{\prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin(\pi(b_j - b_k)) \prod_{j=n+1}^{p} \Gamma(a_j - b_k)} e^{-2 i \pi b_k} x^{b_k}\, {}_p\tilde{F}_{q-1}(1 - a_1 + b_k, \ldots, 1 - a_p + b_k;$$
$$1 - b_1 + b_k, \ldots, 1 - b_{k-1} + b_k, 1 - b_{k+1} + b_k, \ldots, 1 - b_p + b_k; (-1)^{p-m-n} x)\, \theta(1 - |x|) /;$$
$$m + n - p \leq 0 \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\wedge j\neq k\wedge 1\leq j\leq m\wedge 1\leq k\leq m} (a_j - a_k \notin \mathbb{Z}) \bigwedge x < 0$$

Sets of discontinuity

$G_{p,q}^{m,n}\left(z, r \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$ has discontinuity on the unit circle $|z| == 1$in the case $p == q == m + n$. For example, $G_{1,1}^{1,0}\left(z \,\middle|\, \begin{matrix} 1 \\ 0 \end{matrix}\right) == \theta(1 - |z|)$.

Series representations

Generalized power series

Expansions at generic point $z == z_0$

For the function itself

07.34.06.0047.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == \sum_{k=0}^{\infty} \frac{1}{k!} G_{p+1,q+1}^{m,n+1}\left(z \,\middle|\, \begin{matrix} -k, a_1 - k, \ldots, a_n - k, a_{n+1} - k, \ldots, a_p - k \\ b_1 - k, \ldots, b_m - k, 0, b_{m+1} - k, \ldots, b_q - k \end{matrix}\right) (z - z_0)^k /; z_0 \notin (-\infty, 0)$$

07.34.06.0048.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) ==$$
$$\sum_{k=1}^{m} \frac{\left(\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j - b_k)\right) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} \left(\frac{1}{z_0}\right)^{b_k \left\lfloor \frac{\arg(z-z_0)}{2\pi} \right\rfloor} z_0^{b_k \left(\left\lfloor \frac{\arg(z-z_0)}{2\pi} \right\rfloor + 1\right)} \sum_{u=0}^{\infty} \frac{(-b_k)_u (-z_0)^{-u}}{u!}\, {}_{p+1}F_q(b_k + 1, 1 - a_1 + b_k, \ldots,$$
$$1 - a_p + b_k; 1 - u + b_k, 1 - b_1 + b_k, \ldots, 1 - b_{k-1} + b_k, 1 - b_{k+1} + b_k, \ldots, 1 - b_q + b_k; (-1)^{p-m-n} z_0)\, (z - z_0)^u /;$$
$$(p < q \bigvee p == q \bigwedge m + n > p \bigvee p == q \bigwedge m + n == p \bigwedge |z_0| < 1) \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\wedge j\neq k\wedge 1\leq j\leq m\wedge 1\leq k\leq m} (b_j - b_k \notin \mathbb{Z})$$

07.34.06.0049.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=1}^{n} \frac{\left(\prod_{\substack{j=1 \\ j\neq k}}^{n} \Gamma(a_k - a_j)\right) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(1 - a_k + a_j)} \left(\frac{1}{z_0}\right)^{a_k \left\lfloor \frac{\arg(z-z_0)}{2\pi} \right\rfloor} z_0^{a_k \left(1 + \left\lfloor \frac{\arg(z-z_0)}{2\pi} \right\rfloor\right) - 1} \sum_{u=0}^{\infty} \frac{(-z_0)^{-u} (1-a_k)_u}{u!} \, {}_{q+1}F_p\left(1 - a_k + u, 1 - a_k + b_1, \ldots, 1 - a_k + b_q; 1 - a_k, 1 - a_k + a_1, \ldots, 1 - a_k + a_{k-1}, 1 - a_k + a_{k+1}, \ldots, 1 - a_k + a_p; \frac{(-1)^{q-m-n}}{z_0}\right) (z - z_0)^u \; /;$$

$$(p > q \lor p = q \land m + n = p + 1 \land z_0 \notin (-1, 0) \lor p = q \land m + n > p + 1 \lor p = q \land m + n = p \land |z_0| > 1) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq n \land 1\leq k\leq n} \left(a_j - a_k \notin \mathbb{Z}\right)$$

Expansions on branch cuts ||| Expansions on branch cuts

For the function itself

07.34.06.0050.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=0}^{\infty} \frac{1}{k!} G_{p+1,q+1}^{m,n+1}\left(x\, e^{2\pi i \left\lfloor \frac{\arg(z-x)}{2\pi} \right\rfloor} \left| \begin{array}{c} -k, a_1 - k, \ldots, a_n - k, a_{n+1} - k, \ldots, a_p - k \\ b_1 - k, \ldots, b_m - k, 0, b_{m+1} - k, \ldots, b_q - k \end{array} \right.\right) (z - x)^k \; /;$$

$$m \in \mathbb{N} \land n \in \mathbb{N} \land p \in \mathbb{N} \land q \in \mathbb{N} \land m \leq q \land n \leq p \land x < 0$$

07.34.06.0051.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=0}^{\infty} \frac{(-1)^k}{k!} G_{p+1,q+1}^{m+1,n}\left(x\, e^{2\pi i \left\lfloor \frac{\arg(z-x)}{2\pi} \right\rfloor} \left| \begin{array}{c} a_1 - k, \ldots, a_n - k, a_{n+1} - k, \ldots, a_p - k, -k \\ 0, b_1 - k, \ldots, b_m - k, b_{m+1} - k, \ldots, b_q - k \end{array} \right.\right) (z - x)^k \; /;$$

$$m \in \mathbb{N} \land n \in \mathbb{N} \land p \in \mathbb{N} \land q \in \mathbb{N} \land m \leq q \land n \leq p \land x < 0$$

07.34.06.0052.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=0}^{\infty} \frac{1}{k!} G_{p+1,q+1}^{m,n+1}\left(e^{-2\pi i \left\lfloor \frac{\arg(z-x)}{2\pi} \right\rfloor} \frac{1}{x} \left| \begin{array}{c} 1 - b_1 + k, \ldots, 1 - b_m + k, 1, 1 - b_{m+1} + k, \ldots, 1 - b_q + k \\ 1 + k, 1 - a_1 + k, \ldots, 1 - a_n + k, 1 - a_{n+1} + k, \ldots, 1 - a_p + k \end{array} \right.\right) (z - x)^k \; /;$$

$$m \in \mathbb{N} \land n \in \mathbb{N} \land p \in \mathbb{N} \land q \in \mathbb{N} \land m \leq q \land n \leq p \land x < 0$$

07.34.06.0053.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=1}^{m} \frac{\left(\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j - b_k)\right) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} x^{b_k} e^{2 b_k \pi i \left\lfloor \frac{\arg(z-x)}{2\pi} \right\rfloor} \sum_{u=0}^{\infty} \frac{(-b_k)_u (-x)^{-u}}{u!} \, {}_{p+1}F_q\left(b_k + 1, 1 - a_1 + b_k, \ldots, 1 - a_p + b_k; 1 - u + b_k, 1 - b_1 + b_k, \ldots, 1 - b_{k-1} + b_k, 1 - b_{k+1} + b_k, \ldots, 1 - b_q + b_k; (-1)^{p-m-n} x\right) (z - x)^u \; /;$$

$$(p < q \lor p = q \land m + n > p \lor p = q \land m + n = p \land |x| < 1) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq m \land 1\leq k\leq m} \left(b_j - b_k \notin \mathbb{Z}\right) \land x < 0$$

07.34.06.0054.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=1}^{n} \frac{\left(\prod_{\substack{j=1 \\ j\neq k}}^{n} \Gamma(a_k - a_j)\right) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(1 - a_k + a_j)} x^{a_k - 1} e^{2 a_k \pi i \left\lfloor \frac{\arg(z-x)}{2\pi} \right\rfloor} \sum_{u=0}^{\infty} \frac{(-x)^{-u} (1 - a_k)_u}{u!} \, {}_{q+1}F_p\Big(1 - a_k + u, 1 - a_k + b_1, \ldots,$$

$$1 - a_k + b_q; 1 - a_k, 1 - a_k + a_1, \ldots, 1 - a_k + a_{k-1}, 1 - a_k + a_{k+1}, \ldots, 1 - a_k + a_p; \frac{(-1)^{q-m-n}}{x}\Big) (z - x)^u \;/;$$

$(p > q \lor p == q \land m + n == p + 1 \land x \notin (-1, 0) \lor p == q \land m + n > p + 1 \lor p == q \land m + n == p \land |x| > 1) \land$
$\forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq n \land 1 \leq k \leq n} (a_j - a_k \notin \mathbb{Z}) \land x < 0$

For the function itself

Expansions at $z == 0$

Case of simple poles

07.34.06.0001.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)}$$

$$z^{b_k} \left(1 + \frac{\prod_{j=1}^{p} (1 - a_j + b_k)}{\prod_{j=1}^{q} (1 - b_j + b_k)} (-1)^{-m-n+p} z + \frac{\prod_{j=1}^{p} ((1 - a_j + b_k)(2 - a_j + b_k))}{\prod_{j=1}^{q} ((1 - b_j + b_k)(2 - b_j + b_k))} z^2 + \ldots\right) /;$$

$(p < q \lor p == q \land |z| < 1) \land \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq m \land 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$

07.34.06.0002.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j - b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k)} z^{b_k} \sum_{i=0}^{\infty} \frac{\prod_{j=1}^{n} \Gamma(1 - a_j + b_k + i) \prod_{j=n+1}^{p} (1 - a_j + b_k)_i \left((-1)^{-m-n+p} z\right)^i}{\prod_{j=1}^{m} (1 - b_j + b_k)_i \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k + i)} /;$$

$(p < q \lor p == q \land |z| < 1) \land \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq m \land 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$

07.34.06.0003.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) = \sum_{k=1}^{m} \sum_{i=0}^{\infty} \Gamma\mathrm{Res}\left(\begin{array}{ll} b_1, \ldots, b_m; & 1 - a_1, \ldots, 1 - a_n; \\ a_{n+1}, \ldots, a_p; & 1 - b_{m+1}, \ldots, 1 - b_q; \end{array} b_k, 1, i; z\right) /;$$

$(p < q \lor p == q \land |z| < 1) \land \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq m \land 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$

07.34.06.0004.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \pi^{m-1} \sum_{k=1}^{m} \frac{\prod_{j=1}^{n} \Gamma(1-a_j+b_k)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin(\pi(b_j-b_k)) \prod_{j=n+1}^{p} \Gamma(a_j-b_k)} z^{b_k}$$

$${}_p\tilde{F}_{q-1}\left(1-a_1+b_k, \ldots, 1-a_p+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_q+b_k; (-1)^{p-m-n} z\right) /;$$
$$((p<q) \lor (p=q \land m+n>p) \lor (p=q \land m+n=p \land |z|<1)) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\leq j\leq m\land 1\leq k\leq m} (b_j-b_k \notin \mathbb{Z})$$

07.34.06.0005.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j-b_k) \prod_{j=1}^{n} \Gamma(1-a_j+b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j-b_k) \prod_{j=m+1}^{q} \Gamma(1-b_j+b_k)} z^{b_k}$$

$${}_pF_{q-1}\left(1-a_1+b_k, \ldots, 1-a_p+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_q+b_k; (-1)^{p-m-n} z\right) /;$$
$$((p<q) \lor (p=q \land m+n>p) \lor (p=q \land m+n=p \land |z|<1)) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\leq j\leq m\land 1\leq k\leq m} (b_j-b_k \notin \mathbb{Z})$$

07.34.06.0006.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j-b_k) \prod_{j=1}^{n} \Gamma(1-a_j+b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j-b_k) \prod_{j=m+1}^{q} \Gamma(1-b_j+b_k)} z^{b_k} (1+O(z)) /;$$
$$(z\to 0) \land p\leq q \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\land j\neq k\land 1\leq j\leq m\land 1\leq k\leq m} (b_j-b_k \notin \mathbb{Z})$$

Case of poles of order r in the points $-b_r - k$ /; $r \in \{1, 2, 3, 4\} \land k \in \mathbb{N}$

07.34.06.0007.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) /;$$
$$(p<q \lor p=q \land |z|<1) \land b_k-b_{k-1}\in\mathbb{N} \land 2\leq k\leq r \land b_k-b_1\notin\mathbb{Z} \land r+1\leq k\leq m \land r\in\{1,2,3,4\}$$

Expansions at $z = (-1)^{m+n-q}$ for $p = q$

The function $G_{q,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$ near the point $z = (-1)^{m+n-q}$ has a rather complicated behabiour. The general formula (for nonintegers $\psi_q = -\mu = \sum_{j=1}^{q}(a_j-b_j) - 1$ /; $p = q$) includes two major terms that are analytical functions only in the case $m+n>q$. In the opposite case $m+n\leq q$ they are the piecewise analytical functions with possible discontinuities on the unit circle $|z| = 1$. Moreover, the first major term has representation of the form const $(1-z_1)^{\psi_q}(1+O(z_1-1))$ /; $z_1 = (-1)^{q-m-n} z$ and second one is bounded near the point $z_1 = 1$. A more detailed description of this behaviour is presented below.

If $m+n-q>0$, the function $G_{q,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$ is analytic in the sector $|\text{Arg}(z)| < (m+n-q)\pi$.

If $m+n-q==1\bigwedge|\text{Arg}(z)|<\pi$, at the singular point $z==-1$ the function $G_{q,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right)$ is continuous for $\text{Re}(\psi_q)>0$, bounded for $\text{Re}(\psi_q)==0$, $\psi_q\neq 0$ and has, in general, a logarithmic singularity for $\psi_q==0$, while for $\text{Re}(\psi_q)<0$, it has a power singularity of order $-\psi_q$, to which, for integer ψ_qa logarithmic singularity can also be added.

If $m+n-q<1$, the function $G_{q,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right)$ is a piecewise analytic function of z with a discontinuity on the circle $|z|==1$.

If $m+n-q==0$, at the singular point $z==1$it is continuous for $\text{Re}(\psi_q)>0$, bounded for $\text{Re}(\psi_q)==0$, $\psi_q\neq 0$ and has, in general, a logarithmic singularity for $\psi_q==0$, $m\,n\neq 0$, while for $\text{Re}(\psi_q)<0$ it has a power singularity of order $-\psi_q$, to which for integer ψ_qa logarithmic singularity can also occur. Here the asymptotics of this function depends on the way z approaches 1 (from outside or inside the disc $|z|\leq 1$).

The general formula for arbitrary z

07.34.06.0008.01

$$G_{q,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right) == \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_q; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, (-1)^{m+n-q}, \infty\}\right)$$

07.34.06.0055.01

$$G_{q,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right) ==$$

$$\pi^{m-1}\sum_{k=1}^{m}\frac{\prod_{j=1}^{n}\Gamma(1-a_j+b_k)}{\prod_{\substack{j=1\\ j\neq k}}^{m}\sin(\pi(b_j-b_k))\prod_{j=n+1}^{q}\Gamma(a_j-b_k)}\,e^{\pi i\left(2\left\lfloor\frac{\arg(z+1)}{2\pi}\right\rfloor b_k+b_k\right)\left(m+n-q-2\left\lfloor\frac{1}{2}(m+n-q)\right\rfloor\right)}\left(\sum_{\nu=0}^{\infty}\frac{(-1)^{\nu}(-b_k)_{\nu}}{\nu!}\left((-1)^{m+n-q}z-1\right)^{\nu}\right)$$

$$_q\tilde{F}_{q-1}\left(1-a_1+b_k, \ldots, 1-a_q+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_q+b_k; (-1)^{q-m-n}z\right) /;$$
$$(m+n>q\bigvee m+n==q\bigwedge|z|<1)\bigwedge\forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\bigwedge j\neq k\bigwedge 1\leq j\leq m\bigwedge 1\leq k\leq m}\left(b_j-b_k\notin\mathbb{Z}\right)$$

07.34.06.0056.01

$$G_{q,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right) ==$$

$$\pi^{n-1}\sum_{k=1}^{n}\frac{\prod_{j=1}^{m}\Gamma(1-a_k+b_j)}{\prod_{\substack{j=1\\ j\neq k}}^{n}\sin(\pi(a_k-a_j))\prod_{j=m+1}^{q}\Gamma(a_k-b_j)}\,e^{\pi i\left(2\left\lfloor\frac{\arg(z+1)}{2\pi}\right\rfloor a_k+a_k-1\right)\left(q-m-n-2\left\lfloor\frac{1}{2}(q-m-n)\right\rfloor\right)}\left(\sum_{\nu=0}^{\infty}\frac{(-1)^{\nu}(1-a_k)_{\nu}}{\nu!}\left((-1)^{m+n-q}z-1\right)^{\nu}\right)$$

$$_q\tilde{F}_{p-1}\left(1-a_k+b_1, \ldots, 1-a_k+b_q; 1+a_1-a_k, \ldots, 1+a_{k-1}-a_k, 1+a_{k+1}-a_k, \ldots, 1+a_p-a_k; \frac{(-1)^{q-m-n}}{z}\right) /;$$
$$(m+n==q+1\bigwedge z\notin(-1,0)\bigvee m+n>q+1\bigvee m+n==q\bigwedge|z|>1)\bigwedge\forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\bigwedge j\neq k\bigwedge 1\leq j\leq n\bigwedge 1\leq k\leq n}\left(a_j-a_k\notin\mathbb{Z}\right)$$

The general formula for $\psi_q\notin\mathbb{Z}$ in the particular case $|z|>1$

07.34.06.0009.01

$$G_{q,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = -\frac{\pi^{m+n-q}}{\sin(\psi_q \pi)} \sum_{h=1}^{n} \left(z^{a_h-1} \left((-1)^{q-m-n} z\right)^{1-a_h} \frac{\prod_{k=m+1}^{q} \sin((a_h - b_k)\pi)}{\prod_{\substack{k=1 \\ k\neq h}}^{n} \sin((a_h - a_k)\pi)} \left(G_{q,q}^{0,q}\left((-1)^{q-m-n} z \middle| \begin{matrix} a_1, \ldots, a_q \\ b_1, \ldots, b_q \end{matrix}\right) - \frac{1}{\pi^2} \sum_{j=1}^{q} \sin\left(\left(a_h - a_j\right)\pi\right) \frac{\prod_{k=1}^{q} \sin\left(\left(b_k - a_j\right)\pi\right)}{\prod_{\substack{k=1 \\ k\neq j}}^{q} \sin\left(\left(a_k - a_j\right)\pi\right)} G_{q+2,q+2}^{q+2,2}\left((-1)^{q-m-n} z \middle| \begin{matrix} a_h, a_j, a_1, \ldots, a_q \\ a_h, a_j, b_1, \ldots, b_q \end{matrix}\right) \right) \right) /;$$

$$|z| > 1 \bigwedge \left(\psi_q == -\mu == \sum_{j=1}^{q} \left(a_j - b_j\right) - 1 /; p == q\right) \bigwedge \psi_q \notin \mathbb{Z} \bigwedge m\, n \neq 0$$

The major terms in the general formulas for expansions of function $p == q$ at $z == (-1)^{m+n-q}$

07.34.06.0010.01

$$G_{q,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto G_{q,q}^{m,n}\left((-1)^{m+n-q} \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) + \pi^{m+n-q-1}\, \Gamma\left(-\psi_q\right) \sum_{h=1}^{m} e^{(m+n-q)\pi i\, b_h} \frac{\prod_{k=n+1}^{q} \sin((a_k - b_h)\pi)}{\prod_{\substack{k=1 \\ k\neq h}}^{m} \sin((b_k - b_h)\pi)} \left(1 - (-1)^{q-m-n} z\right)^{\psi_q} \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) /;$$

$$\left(z \to (-1)^{m+n-q}\right) \bigwedge |z| < 1 \bigwedge \left(\psi_q == -\mu == \sum_{j=1}^{q} \left(a_j - b_j\right) - 1 /; p == q\right) \bigwedge \psi_q \notin \mathbb{Z}$$

07.34.06.0011.01

$$G_{q,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto G_{q,q}^{m,n}\left((-1)^{m+n-q} \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) + \pi^{m+n-q-1}\, \Gamma\left(-\psi_q\right) \sum_{h=1}^{n} e^{(m+n-q)\pi i\,(1-a_h)} \frac{\prod_{k=m+1}^{q} \sin((a_h - b_k)\pi)}{\prod_{\substack{k=1 \\ k\neq h}}^{n} \sin((a_h - a_k)\pi)} \left(1 - \frac{(-1)^{q-m-n}}{z}\right)^{\psi_q} \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) /;$$

$$\left(z \to (-1)^{m+n-q}\right) \bigwedge |z| > 1 \bigwedge \left(\psi_q == -\mu == \sum_{j=1}^{q} \left(a_j - b_j\right) - 1 /; p == q\right) \bigwedge \psi_q \notin \mathbb{Z}$$

07.34.06.0012.01

$$G_{q,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto G_{q,q}^{m,n}\left((-1)^{m+n-q} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)\left(1 + O\left(z - (-1)^{m+n-q}\right)\right) -$$

$$\pi^{m+n-q-1} \sum_{h=1}^{m} \frac{\prod_{k=n+1}^{q} \sin((a_k - b_h)\pi)}{\prod_{\substack{k=1 \\ k \neq h}}^{m} \sin((b_k - b_h)\pi)} e^{(m+n-q)\pi i b_h} \log(1 - (-1)^{q-m-n} z) \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) /;$$

$$\left(z \to (-1)^{m+n-q}\right) \bigwedge |z| < 1 \bigwedge \left(\psi_q == -\mu == \sum_{j=1}^{q} \left(a_j - b_j\right) - 1 /; p == q\right) \bigwedge \psi_q == 0$$

Expansions at $z == \infty$

Case of simple poles

07.34.06.0013.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{n} \Gamma\left(a_k - a_j\right) \prod_{j=1}^{m} \Gamma\left(1 - a_k + b_j\right)}{\prod_{j=m+1}^{q} \Gamma\left(a_k - b_j\right) \prod_{j=n+1}^{p} \Gamma\left(a_j - a_k + 1\right)}$$

$$z^{a_k - 1}\left(1 + \frac{(-1)^{q-m-n} \prod_{j=1}^{q} \left(1 - a_k + b_j\right)}{\prod_{j=1}^{p} \left(1 + a_j - a_k\right) z} + \frac{\prod_{j=1}^{q} \left(\left(1 - a_k + b_j\right)\left(2 - a_k + b_j\right)\right)}{\prod_{j=1}^{p} \left(\left(1 + a_j - a_k\right)\left(2 + a_j - a_k\right)\right) z^2} + \ldots\right) /;$$

$$(p > q \bigvee p == q \bigwedge |z| > 1) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \bigwedge j \neq k \bigwedge 1 \leq j \leq n \bigwedge 1 \leq k \leq n} \left(a_j - a_k \notin \mathbb{Z}\right)$$

07.34.06.0014.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{n} \Gamma\left(a_k - a_j\right)}{\prod_{j=m+1}^{q} \Gamma\left(a_k - b_j\right)} z^{a_k - 1} \sum_{i=0}^{\infty} \frac{\prod_{j=1}^{m} \Gamma\left(1 - a_k + b_j + i\right) \prod_{j=m+1}^{q} \left(1 - a_k + b_j\right)_i}{\prod_{j=1}^{n} \left(a_j - a_k + 1\right)_i \prod_{j=n+1}^{p} \Gamma\left(1 + a_j - a_k + i\right)} \left(\frac{(-1)^{q-m-n}}{z}\right)^i /;$$

$$(p > q \bigvee p == q \bigwedge |z| > 1) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \bigwedge j \neq k \bigwedge 1 \leq j \leq n \bigwedge 1 \leq k \leq n} \left(a_j - a_k \notin \mathbb{Z}\right)$$

07.34.06.0015.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == \sum_{k=1}^{n} \sum_{i=0}^{\infty} \Gamma\text{Res}\left(\begin{matrix} b_1, \ldots, b_m; & 1 - a_1, \ldots, 1 - a_n; \\ a_{n+1}, \ldots, a_p; & 1 - b_{m+1}, \ldots, 1 - b_q; \end{matrix} \; 1 - a_k, 1, i; z\right) /;$$

$$(p > q \bigvee p == q \bigwedge |z| > 1) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \bigwedge j \neq k \bigwedge 1 \leq j \leq n \bigwedge 1 \leq k \leq n} \left(a_j - a_k \notin \mathbb{Z}\right)$$

07.34.06.0016.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == \pi^{n-1} \sum_{k=1}^{n} \frac{\prod_{j=1}^{m} \Gamma\left(1 - a_k + b_j\right)}{\prod_{\substack{j=1 \\ j \neq k}}^{n} \sin\left(\pi\left(a_k - a_j\right)\right) \prod_{j=m+1}^{q} \Gamma\left(a_k - b_j\right)} z^{a_k - 1}$$

$${}_q\tilde{F}_{p-1}\left(1 - a_k + b_1, \ldots, 1 - a_k + b_q; 1 + a_1 - a_k, \ldots, 1 + a_{k-1} - a_k, 1 + a_{k+1} - a_k, \ldots, 1 + a_p - a_k; \frac{(-1)^{q-m-n}}{z}\right) /;$$

$$((p > q) \bigvee (p == q \bigwedge m + n == p + 1 \bigwedge z \notin (-1, 0)) \bigvee (p == q \bigwedge m + n > p + 1) \bigvee (p == q \bigwedge m + n == p \bigwedge |z| > 1)) \bigwedge$$
$$\forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \bigwedge j \neq k \bigwedge 1 \leq j \leq n \bigwedge 1 \leq k \leq n} \left(a_j - a_k \notin \mathbb{Z}\right)$$

07.34.06.0017.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{n} \Gamma(a_k - a_j) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(a_j - a_k + 1)} z^{a_k - 1}$$

$$ {}_qF_{p-1}\left(1 - a_k + b_1, \ldots, 1 - a_k + b_q; 1 + a_1 - a_k, \ldots, 1 + a_{k-1} - a_k, 1 + a_{k+1} - a_k, \ldots, 1 + a_p - a_k; \frac{(-1)^{q-m-n}}{z}\right) /;$$

$$((p > q) \lor (p = q \land m + n = p + 1 \land z \notin (-1, 0)) \lor (p = q \land m + n > p + 1) \lor (p = q \land m + n = p \land |z| > 1)) \land \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq n \land 1 \leq k \leq n} (a_j - a_k \notin \mathbb{Z})$$

07.34.06.0018.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{n} \Gamma(a_k - a_j) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(a_j - a_k + 1)} z^{a_k - 1} \left(1 + O\left(\frac{1}{z}\right)\right) /;$$

$$(|z| \to \infty) \land (p \geq q) \land \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq n \land 1 \leq k \leq n} (a_j - a_k \notin \mathbb{Z})$$

Case of poles of order r in the points $-a_r + k$ /; $r \in \{1, 2, 3, 4\} \land k \in \mathbb{N}^+$

07.34.06.0019.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, \infty, \infty\}\right) /;$$

$$(p > q \lor p = q \land |z| > 1) \land a_{k-1} - a_k \in \mathbb{N} \land 2 \leq k \leq r \land a_k - a_1 \notin \mathbb{Z} \land r + 1 \leq k \leq n \land r \in \{1, 2, 3, 4\}$$

Asymptotic series expansions at $z = 0$ for $q < p$

Expansions for $p = q + 1$

07.34.06.0020.01

$$G_{q+1,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{q+1} \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto$$

$$\mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_{q+1}; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) + \mathcal{A}_G^{(\text{exp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_{q+1}; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) /; (z \to 0)$$

07.34.06.0021.01

$$G_{q+1,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{q+1} \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{q+1} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} z^{b_k} (1 + O(z)) +$$

$$\pi^{m+n-q-1} \exp\left(\frac{(-1)^{q-m-n}}{z}\right) \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j \neq r}}^{n} \sin(\pi (a_r - a_j))} z^{a_r - 1} \left(\frac{(-1)^{q-m-n}}{z}\right)^{\chi + a_r - 1} (1 + O(z)) /;$$

$$(z \to 0) \bigwedge \chi = \sum_{j=1}^{q} b_j - \sum_{j=1}^{q+1} a_j + 1 \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq m \land 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$$

Expansions for $p == q + 2$

07.34.06.0022.01

$$G_{q+2,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{q+2} \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_{q+2}; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) + \mathcal{A}_G^{(\text{trig})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_{q+2}; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) /; (z \to 0)$$

07.34.06.0023.01

$$G_{q+2,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{q+2} \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{q+2} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} z^{b_k} (1 + O(z)) +$$

$$\frac{\pi^{m+n-q-\frac{3}{2}}}{2} \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi(a_r - b_j))}{\prod_{\substack{j=1 \\ j \neq r}}^{n} \sin(\pi(a_r - a_j))} z^{a_r - 1} \left(\frac{(-1)^{q-m-n-1}}{z}\right)^{\chi + a_r - 1} \left(\exp\left(i\left(\pi(\chi + a_r - 1) + 2\sqrt{\frac{(-1)^{q-m-n-1}}{z}}\right)\right)\right.$$

$$\left.\left(1 + O\left(\sqrt{z}\right)\right) + \exp\left(-i\left(\pi(\chi + a_r - 1) + 2\sqrt{\frac{(-1)^{q-m-n-1}}{z}}\right)\right)\left(1 + O\left(\sqrt{z}\right)\right)\right) /;$$

$$(z \to 0) \bigwedge \chi == \frac{1}{2}\left(\sum_{j=1}^{q} b_j - \sum_{j=1}^{q+2} a_j + \frac{3}{2}\right) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq m \land 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$$

07.34.06.0024.01

$$G_{q+2,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{q+2} \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto$$

$$\sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{q+2} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} z^{b_k} (1 + O(z)) - \pi^{m+n-q-\frac{3}{2}} \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi(a_r - b_j))}{\prod_{\substack{j=1 \\ j \neq r}}^{n} \sin(\pi(a_r - a_j))} z^{a_r - 1} \left(\frac{(-1)^{q-m-n-1}}{z}\right)^{\chi + a_r - 1}$$

$$\left(\cos\left(\pi(\chi + a_r) + 2\sqrt{\frac{(-1)^{q-m-n-1}}{z}}\right)(1 + O(z)) + \frac{c_1}{2\sqrt{\frac{(-1)^{q-m-n-1}}{z}}} \sin\left(\pi(\chi + a_r) + 2\sqrt{\frac{(-1)^{q-m-n-1}}{z}}\right)(1 + O(z))\right) /;$$

$$(z \to 0) \bigwedge \chi == \frac{1}{2}\left(\sum_{j=1}^{q} b_j - \sum_{j=1}^{q+2} a_j + \frac{3}{2}\right) \bigwedge c_1 == \frac{1}{4}\left(\sum_{j=1}^{q+2} a_j - \sum_{j=1}^{q} b_j\right)^2 + \sum_{s=2}^{q+2} \sum_{j=1}^{s-1} a_s a_j - \sum_{s=2}^{q} \sum_{j=1}^{s-1} b_s b_j +$$

$$\frac{1}{2}\left(\left(\sum_{j=1}^{q} b_j\right)^2 - \left(\sum_{j=1}^{q+2} a_j\right)^2\right) + \frac{1}{16} \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq m \land 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$$

Expansions for $p > q + 2$

07.34.06.0025.01

$$G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) + \mathcal{A}_G^{(\text{hyp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, 0, \infty\}\right) /; (z \to 0) \bigwedge p > q + 2$$

07.34.06.0026.01

$$G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} z^{b_k} (1 + O(z)) +$$

$$\frac{(2\pi)^{\frac{1-\beta}{2}} \pi^{m+n-q-1}}{\sqrt{\beta}} \left(\exp\left(\beta\, e^{\frac{\pi i (q-m-n)}{\beta}} \left(\frac{1}{z}\right)^{1/\beta}\right) \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j \neq r}}^{n} \sin(\pi (a_r - a_j))} e^{\pi i (q-m-n)(\chi + a_r - 1)} \left(1 + O\left(z^{\frac{1}{\beta}}\right)\right) + \right.$$

$$\left. \exp\left(\beta\, e^{-\frac{\pi i (q-m-n)}{\beta}} \left(\frac{1}{z}\right)^{1/\beta}\right) \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j \neq r}}^{n} \sin(\pi (a_r - a_j))} e^{-\pi i (q-m-n)(\chi + a_r - 1)} \left(1 + O\left(z^{\frac{1}{\beta}}\right)\right) \right) /;$$

$$(z \to 0) \bigwedge p > q + 2 \bigwedge \beta == p - q \bigwedge \chi == \frac{1}{\beta}\left(\sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j + \frac{1+\beta}{2}\right) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \wedge j \neq k \wedge 1 \leq j \leq m \wedge 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$$

07.34.06.0027.01

$$G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto$$

$$\sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} z^{b_k} (1 + O(z)) + \frac{2 (2\pi)^{\frac{1-\beta}{2}} \pi^{m+n-q-1}}{\sqrt{\beta}} \exp\left(\beta \cos\left(\frac{\pi (q-m-n)}{\beta}\right) \left(\frac{1}{z}\right)^{1/\beta}\right)$$

$$\sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j \neq r}}^{n} \sin(\pi (a_r - a_j))} \cos\left(\pi (q-m-n)(\chi + a_r - 1) + \beta \sin\left(\frac{\pi (q-m-n)}{\beta}\right) \left(\frac{1}{z}\right)^{1/\beta}\right) \left(1 + O\left(z^{\frac{1}{\beta}}\right)\right) /;$$

$$(z \to 0) \bigwedge p > q + 2 \bigwedge \beta == p - q \bigwedge \chi == \frac{1}{\beta}\left(\sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j + \frac{1+\beta}{2}\right) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \wedge j \neq k \wedge 1 \leq j \leq m \wedge 1 \leq k \leq m} (b_j - b_k \notin \mathbb{Z})$$

Asymptotic series expansions at $z == \infty$ for $q > p$

Expansions for $q == p + 1$

07.34.06.0028.01

$$G_{p,p+1}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{p+1} \end{array} \right.\right) \propto \mathcal{A}_G^{(\text{power})}\left(\begin{array}{cc} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_{p+1}; \end{array} \{z, \infty, \infty\}\right) + \mathcal{A}_G^{(\exp)}\left(\begin{array}{cc} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_{p+1}; \end{array} \{z, \infty, \infty\}\right) /; (|z| \to \infty)$$

07.34.06.0029.02

$$G_{p,p+1}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{p+1} \end{array} \right.\right) \propto \pi^{m+n-p-1} \exp((-1)^{p-m-n} z) \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin((a_j - b_k)\pi)}{\prod_{\substack{j=1 \\ j \neq k}}^{m} \sin(\pi(b_j - b_k))} z^{b_k} ((-1)^{p-m-n} z)^{\chi - b_k} \left(1 + O\left(\frac{1}{z}\right)\right) + \pi^{m+n-p} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin((a_j - b_k)\pi)}{\prod_{\substack{j=1 \\ j \neq k}}^{m} \sin(\pi(b_j - b_k))} z^{b_k} \sum_{i=1}^{p} \frac{\prod_{\substack{s=1 \\ s \neq i}}^{p} \Gamma(a_i - a_s)}{\sin((a_i - b_k)\pi) \prod_{s=1}^{p+1} \Gamma(a_i - b_s)} ((-1)^{p-m-n-1} z)^{a_i - b_k - 1} \left(1 + O\left(\frac{1}{z}\right)\right) /; (|z| \to \infty) \bigwedge \chi == \sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq n \land 1 \leq k \leq n} (\neg\, a_j - a_k \in \mathbb{Z})$$

Expansions for $q == p + 2$

07.34.06.0030.01

$$G_{p,p+2}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{p+2} \end{array} \right.\right) \propto \mathcal{A}_G^{(\text{power})}\left(\begin{array}{cc} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_{p+2}; \end{array} \{z, \infty, \infty\}\right) + \mathcal{A}_G^{(\text{trig})}\left(\begin{array}{cc} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_{p+2}; \end{array} \{z, \infty, \infty\}\right) /; (|z| \to \infty)$$

07.34.06.0031.02

$$G_{p,p+2}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{p+2} \end{array} \right.\right) \propto \frac{1}{2} \pi^{m+n-p-\frac{3}{2}} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin((a_j - b_k)\pi)}{\prod_{\substack{j=1 \\ j \neq k}}^{m} \sin(\pi(b_j - b_k))} z^{b_k} \left((-1)^{p-m-n-1} z\right)^{\chi - b_k} \left(e^{-i\left(\pi(\chi - b_k) + 2\sqrt{(-1)^{p-m-n-1} z}\right)} \left(1 + O\left(\frac{1}{\sqrt{(-1)^{p-m-n-1} z}}\right)\right) + e^{i\left(\pi(\chi - b_k) + 2\sqrt{(-1)^{p-m-n-1} z}\right)} \left(1 + O\left(\frac{1}{\sqrt{(-1)^{p-m-n-1} z}}\right)\right)\right) + \pi^{m+n-p} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin((a_j - b_k)\pi)}{\prod_{\substack{j=1 \\ j \neq k}}^{m} \sin(\pi(b_j - b_k))} z^{b_k} \sum_{i=1}^{p} \frac{\prod_{\substack{s=1 \\ s \neq i}}^{p} \Gamma(a_i - a_s)}{\sin((a_i - b_k)\pi) \prod_{s=1}^{p+2} \Gamma(a_i - b_s)} ((-1)^{p-m-n-1} z)^{a_i - b_k - 1} \left(1 + O\left(\frac{1}{z}\right)\right) /; (|z| \to \infty) \bigwedge \chi == \frac{1}{2}\left(\sum_{j=1}^{p+2} b_j - \sum_{j=1}^{p} a_j - \frac{1}{2}\right) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq n \land 1 \leq k \leq n} (\neg\, a_j - a_k \in \mathbb{Z})$$

07.34.06.0032.02

$$G_{p,p+2}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{p+2} \end{matrix}\right) \propto$$

$$\pi^{m+n-p-\frac{3}{2}} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin\left(\left(a_j - b_k\right)\pi\right)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin\left(\pi\left(b_j - b_k\right)\right)} z^{\frac{b_k}{r}} \left((-1)^{p-m-n-1} z\right)^{\chi - b_k} \left(\cos\left(\pi(\chi - b_k) + 2\sqrt{(-1)^{p-m-n-1} z}\right)\left(1 + O\left(\frac{1}{z}\right)\right) + \right.$$

$$\left. \frac{c_1}{\sqrt{(-1)^{p-m-n-1} z}} \sin\left(\pi(\chi - b_k) + 2\sqrt{(-1)^{p-m-n-1} z}\right)\left(1 + O\left(\frac{1}{z}\right)\right)\right) +$$

$$\pi^{m+n-p} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin\left(\left(a_j - b_k\right)\pi\right)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin\left(\pi\left(b_j - b_k\right)\right)} z^{b_k} \sum_{i=1}^{p} \frac{\prod_{\substack{s=1 \\ s\neq i}}^{p} \Gamma(a_i - a_s)}{\sin((a_i - b_k)\pi) \prod_{s=1}^{p+2} \Gamma(a_i - b_s)} \left((-1)^{p-m-n-1} z\right)^{a_i - b_k - 1} \left(1 + O\left(\frac{1}{z}\right)\right) /;$$

$$(|z| \to \infty) \bigwedge \chi == \frac{1}{2}\left(\sum_{j=1}^{p+2} b_j - \sum_{j=1}^{p} a_j - \frac{1}{2}\right) \bigwedge$$

$$c_1 == \frac{3}{4}\left(\sum_{j=1}^{p} a_j\right)^2 - \frac{1}{4}\left(\sum_{j=1}^{p+2} b_j\right)^2 - \frac{1}{2} \sum_{j=1}^{p+2} b_j \sum_{s=1}^{p} a_s + \sum_{j=1}^{p+2} b_j \sum_{s=1}^{j-1} b_s - \sum_{j=1}^{p} \sum_{s=j+1}^{p} a_s\, a_j + \frac{1}{16} \bigwedge$$

$$\forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq n \land 1\leq k\leq n} \left(\neg\, a_j - a_k \in \mathbb{Z}\right)$$

Expansions for $q > p + 2$

07.34.06.0033.01

$$G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto$$

$$\mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, \infty, \infty\}\right) + \mathcal{A}_G^{(\text{hyp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \{z, \infty, \infty\}\right) /; (|z| \to \infty) \bigwedge q > p + 2$$

07.34.06.0034.02

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \frac{\pi^{m+n-p-1} (2\pi)^{\frac{1-\beta}{2}}}{\sqrt{\beta}} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin((a_j - b_k)\pi)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin(\pi(b_j - b_k))} z^{\chi} \left(e^{\pi i (p-m-n)(\chi - b_k)} e^{\beta e^{\frac{\pi i (p-m-n)}{\beta}} z^{1/\beta}} \left(1 + O\left(\frac{1}{((-1)^{p-m-n} z)^{1/\beta}}\right)\right) + e^{-\pi i (p-m-n)(\chi - b_k)} e^{\beta e^{-\frac{\pi i (p-m-n)}{\beta}} z^{1/\beta}} \left(1 + O\left(\frac{1}{((-1)^{p-m-n} z)^{1/\beta}}\right)\right)\right) + \pi^{m+n-p} \sum_{k=1}^{m} \frac{\prod_{j=n+1}^{p} \sin((a_j - b_k)\pi)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin(\pi(b_j - b_k))} z^{b_k} \sum_{i=1}^{p} \frac{\prod_{\substack{s=1 \\ s\neq i}}^{p} \Gamma(a_i - a_s)}{\sin((a_i - b_k)\pi) \prod_{s=1}^{q} \Gamma(a_i - b_s)} ((-1)^{p-m-n-1} z)^{a_i - b_k - 1} \left(1 + O\left(\frac{1}{z}\right)\right) /;$$

$$(|z| \to \infty) \bigwedge q > p + 2 \bigwedge \beta == q - p \bigwedge \chi == \frac{1}{\beta}\left(\frac{1-\beta}{2} - \sum_{j=1}^{p} a_j + \sum_{j=1}^{q} b_j\right) \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\wedge j\neq k \wedge 1\leq j\leq n \wedge 1\leq k\leq n} (\neg\, a_j - a_k \in \mathbb{Z})$$

General formulas of asymptotic series expansions

07.34.06.0036.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \mathcal{A}_G\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, 0, \infty\}\right) /; (z \to 0)$$

07.34.06.0037.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, 0, \infty\}\right) + \delta_{p,q+1} \mathcal{A}_G^{(\text{exp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_{q+1}; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, 0, \infty\}\right) + \delta_{p,q+2} \mathcal{A}_G^{(\text{trig})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_{q+2}; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, 0, \infty\}\right) + (1 - \delta_{p,q+1})(\theta(p-q-2) - \delta_{p,q+1} - \delta_{p,q+2}) \mathcal{A}_G^{(\text{hyp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, 0, \infty\}\right) /; (z \to 0)$$

07.34.06.0038.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \mathcal{A}_G\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, \tilde{\infty}, \infty\}\right) /; (|z| \to \infty)$$

07.34.06.0039.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \mathcal{A}_G^{(\text{power})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, \tilde{\infty}, \infty\}\right) + \delta_{q,p+1} \mathcal{A}_G^{(\text{exp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_{p+1}; \end{matrix} \; \{z, \tilde{\infty}, \infty\}\right) + \delta_{q,p+2} \mathcal{A}_G^{(\text{trig})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_{p+2}; \end{matrix} \; \{z, \tilde{\infty}, \infty\}\right) + (1 - \delta_{q,p+1})(\theta(q-p-2) - \delta_{q,p+1} - \delta_{q,p+2}) \mathcal{A}_G^{(\text{hyp})}\left(\begin{matrix} a_1, \ldots, a_n; & a_{n+1}, \ldots, a_p; \\ b_1, \ldots, b_m; & b_{m+1}, \ldots, b_q; \end{matrix} \; \{z, \tilde{\infty}, \infty\}\right) /; (|z| \to \infty)$$

Main terms of asymptotic expansions

Expansions at $z == 0$

07.34.06.0040.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{q} \Gamma(1 - b_j + b_k)} z^{b_k} (1 + O(z)) +$$

$$\delta_{p,q+1}\, d_1 + \delta_{p,q+2}\, d_2 + (1 - \delta_{p,q+1}) \left(\theta(p - q - 2) - \delta_{p,q+1} - \delta_{p,q+2}\right) d_3 \;/;$$

$$(z \to 0) \bigwedge \beta == p - q \bigwedge d_1 == \pi^{m+n-q-1} \exp\left(\frac{(-1)^{q-m-n}}{z}\right) \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j\neq r}}^{n} \sin(\pi (a_r - a_j))} z^{a_r - 1} \left(\frac{(-1)^{q-m-n}}{z}\right)^{\chi + a_r - 1} (1 + O(z)) \bigwedge$$

$$d_2 == -\pi^{m+n-q-\frac{3}{2}} \sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j\neq r}}^{n} \sin(\pi (a_r - a_j))} z^{a_r - 1} \left(\frac{(-1)^{q-m-n-1}}{z}\right)^{\chi + a_r - 1} \cos\left(\pi (\chi + a_r) + 2 \sqrt{\frac{(-1)^{q-m-n-1}}{z}}\right) \left(1 + O\left(\sqrt{z}\right)\right) \bigwedge$$

$$d_3 == \frac{2 (2\pi)^{\frac{1-\beta}{2}} \pi^{m+n-q-1}}{\sqrt{\beta}} \exp\left(\beta \cos\left(\frac{\pi (q - m - n)}{\beta}\right) \left(\frac{1}{z}\right)^{1/\beta}\right)$$

$$\sum_{r=1}^{n} \frac{\prod_{j=m+1}^{q} \sin(\pi (a_r - b_j))}{\prod_{\substack{j=1 \\ j\neq r}}^{n} \sin(\pi (a_r - a_j))} \cos\left(\pi (q - m - n) (\chi + a_r - 1) + \beta \sin\left(\frac{\pi (q - m - n)}{\beta}\right) \left(\frac{1}{z}\right)^{1/\beta}\right) \left(1 + O\left(z^{\frac{1}{\beta}}\right)\right) \bigwedge$$

$$\chi == \frac{1}{\beta} \left(\sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j + \frac{1 + \beta}{2}\right) \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq m \land 1\leq k\leq m} \left(b_j - b_k \notin \mathbb{Z}\right)$$

Expansions at $z == (-1)^{m+n-q}$ for $p == q$

07.34.06.0041.01

$$G_{q,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto c \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) + d \left(1 - (-1)^{q-m-n} z\right)^{\psi_q} \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) /;$$

$$\left(z \to (-1)^{m+n-q}\right) \bigwedge |z| < 1 \bigwedge \psi_q == \sum_{j=1}^{q} (a_j - b_j) - 1 \bigwedge c == G_{q,q}^{m,n}\left((-1)^{m+n-q} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \bigwedge$$

$$d == \pi^{m+n-q-1} \Gamma(-\psi_q) \sum_{h=1}^{m} e^{(m+n-q)\pi i\, b_h} \frac{\prod_{k=n+1}^{q} \sin((a_k - b_h)\pi)}{\prod_{\substack{k=1 \\ k\neq h}}^{m} \sin((b_k - b_h)\pi)} \bigwedge \psi_q \notin \mathbb{Z}$$

07.34.06.0042.01

$$G_{q,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto c\left(1 + O\left(z - (-1)^{m+n-q}\right)\right) + d\left(1 - \frac{(-1)^{q-m-n}}{z}\right)^{\psi_q} \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) /;$$

$$\left(z \to (-1)^{m+n-q}\right) \bigwedge |z| > 1 \bigwedge \psi_q == \sum_{j=1}^{q} \left(a_j - b_j\right) - 1 \bigwedge c == G_{q,q}^{m,n}\left((-1)^{m+n-q} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \bigwedge$$

$$d == \pi^{m+n-q-1}\, \Gamma\left(-\psi_q\right) \sum_{h=1}^{n} e^{(m+n-q)\pi i \left(1-a_h\right)} \frac{\prod_{k=m+1}^{q} \sin((a_h - b_k)\,\pi)}{\prod_{\substack{k=1 \\ k \neq h}}^{n} \sin((a_h - a_k)\,\pi)} \bigwedge \psi_q \notin \mathbb{Z}$$

07.34.06.0043.01

$$G_{q,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \propto c\left(1 + O\left(z - (-1)^{m+n-q}\right)\right) + d\, \log\left(1 - (-1)^{q-m-n} z\right) \left(1 + O\left(z - (-1)^{m+n-q}\right)\right) /;$$

$$\left(z \to (-1)^{m+n-q}\right) \bigwedge |z| < 1 \bigwedge \psi_q == \sum_{j=1}^{q} \left(a_j - b_j\right) - 1 \bigwedge c == G_{q,q}^{m,n}\left((-1)^{m+n-q} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) \bigwedge$$

$$d == -\pi^{m+n-q-1} \sum_{h=1}^{m} \frac{\prod_{k=n+1}^{q} \sin((a_k - b_h)\,\pi)}{\prod_{\substack{k=1 \\ k \neq h}}^{m} \sin((b_k - b_h)\,\pi)} e^{(m+n-q)\pi i\, b_h} \bigwedge \psi_q == 0$$

Expansions at $z == \infty$

07.34.06.0044.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) \propto \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{n} \Gamma(a_k - a_j) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(a_j - a_k + 1)} z^{a_k - 1} \left(1 + O\left(\frac{1}{z}\right)\right) +$$

$$\delta_{q,p+1} d_1 + \delta_{q,p+2} d_2 + (1 - \delta_{q,p+1}) (\theta(-p + q - 2) - \delta_{q,p+1} - \delta_{q,p+2}) d_3 \;/;$$

$$(|z| \to \infty) \bigwedge \beta == q - p \bigwedge d_1 == \pi^{m+n-p-1} \exp((-1)^{p-m-n} z) \sum_{r=1}^{m} \frac{\prod_{j=n+1}^{p} \sin(\pi (a_j - b_r))}{\prod_{\substack{j=1 \\ j\neq r}}^{m} \sin(\pi (b_j - b_r))} z^{b_r} ((-1)^{p-m-n} z)^{\chi - b_r} \left(1 + O\left(\frac{1}{z}\right)\right) \bigwedge$$

$$d_2 == \pi^{m+n-p-\frac{3}{2}} \sum_{r=1}^{m} \frac{\prod_{j=n+1}^{p} \sin(\pi (a_j - b_r))}{\prod_{\substack{j=1 \\ j\neq r}}^{m} \sin(\pi (b_j - b_r))} z^{b_r} \left((-1)^{p-m-n-1} z\right)^{\chi - b_r} \cos\left(\pi (\chi - b_r) + 2 \sqrt{(-1)^{p-m-n-1} z}\right) \left(1 + O\left(\frac{1}{\sqrt{z}}\right)\right) \bigwedge$$

$$d_3 == \frac{2 (2\pi)^{\frac{1-\beta}{2}} \pi^{m+n-p-1}}{\sqrt{\beta}} \exp\left(\beta \cos\left(\frac{\pi (p - m - n)}{\beta}\right) z^{1/\beta}\right)$$

$$\sum_{r=1}^{m} \frac{\prod_{j=n+1}^{p} \sin(\pi (a_j - b_r))}{\prod_{\substack{j=1 \\ j\neq r}}^{m} \sin(\pi (b_j - b_r))} \cos\left(\pi (p - m - n) (\chi - b_r) + \beta \sin\left(\frac{\pi (p - m - n)}{\beta}\right) z^{1/\beta}\right) \left(1 + O\left(\frac{1}{z^{1/\beta}}\right)\right) \bigwedge$$

$$\chi == \frac{1}{\beta} \left(\frac{1 - \beta}{2} - \sum_{j=1}^{p} a_j + \sum_{j=1}^{q} b_j\right) \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \wedge j\neq k \wedge 1\leq j\leq n \wedge 1\leq k\leq n} (a_j - a_k \notin \mathbb{Z})$$

Residue representations

07.34.06.0045.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) == \sum_{k=1}^{m} \sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\prod_{k=1}^{m} \Gamma(s + b_k) \prod_{k=1}^{n} \Gamma(1 - a_k - s)}{\prod_{k=n+1}^{p} \Gamma(s + a_k) \prod_{k=m+1}^{q} \Gamma(1 - b_k - s)} z^{-s}\right) (-b_k - j) \;/;\; p < q \bigvee (p == q \bigwedge |z| < 1)$$

07.34.06.0046.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) == -\sum_{k=1}^{n} \sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\prod_{k=1}^{m} \Gamma(s + b_k) \prod_{k=1}^{n} \Gamma(1 - a_k - s)}{\prod_{k=n+1}^{p} \Gamma(s + a_k) \prod_{k=m+1}^{q} \Gamma(1 - b_k - s)} z^{-s}\right) (1 - a_k + j) \;/;$$

$$p > q \bigvee (p == q \bigwedge |z| > 1)$$

Integral representations

Contour integral representations

07.34.07.0001.01

$$G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array} \right.\right) == \frac{1}{2\pi i} \int_{\mathcal{L}} \frac{\prod_{k=1}^{m} \Gamma(s + b_k) \prod_{k=1}^{n} \Gamma(1 - a_k - s)}{\prod_{k=n+1}^{p} \Gamma(s + a_k) \prod_{k=m+1}^{q} \Gamma(1 - b_k - s)} z^{-s} \, ds \;/;$$

$$m \in \mathbb{N} \bigwedge n \in \mathbb{N} \bigwedge p \in \mathbb{N} \bigwedge q \in \mathbb{N} \bigwedge m \leq q \bigwedge n \leq p$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

The differential equation for Meijer G function $G_{p,q}^{m,n}\left(z \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right.\right)$ has the order $\max(p, q)$. It has two ($z == 0$, $z == \tilde{\infty}$ for $p \neq q$) or three ($z == 0$, $z == (-1)^{m+n-p}$, $z == \tilde{\infty}$, for $p == q$) singular points. If $p < q$ (or $p > q$), then the point $z == 0$ (or $z == \tilde{\infty}$) is a regular singular point, while $z == \tilde{\infty}$ (or $z == 0$) is a nonregular (essential) singular point; if $p == q$, then all three singular points are regular.

Representation of fundamental system solutions near point $z == 0$ for $p \leq q$ in the general case

07.34.13.0001.01

$$\left((-1)^{m+n-p} z \prod_{l=1}^{p}\left(z \frac{d}{d z}+1-a_l\right)-\prod_{k=1}^{q}\left(z \frac{d}{d z}-b_k\right)\right) w(z) == 0 /;$$

$$w(z) == c_1 G_{p,q}^{m,n}\left(z \left| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right.\right)+\sum_{k=2}^{q} c_k G_{p,q}^{1,p}\left((-1)^{1-m-n+p} z \left| \begin{array}{c} a_1, \ldots, a_p \\ b_k, b_1, \ldots, b_{k-1}, b_{k+1}, \ldots, b_q \end{array}\right.\right) \bigwedge$$

$$p \leq q \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \wedge j \neq k \wedge 1 \leq j \leq q \wedge 1 \leq k \leq q}\left(b_j-b_k \notin \mathbb{Z}\right)$$

07.34.13.0004.01

$$\left((-1)^{m+n-p} z \prod_{l=1}^{p}\left(z \frac{d}{d z}+1-a_l\right)-\prod_{k=1}^{q}\left(z \frac{d}{d z}-b_k\right)\right) w(z) == 0 /; w(z) =$$

$$\sum_{k=1}^{q} c_k z^{b_k} {}_pF_{q-1}\left(1-a_1+b_k, \ldots, 1-a_p+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_q+b_k; (-1)^{p-m-n} z\right) \bigwedge$$

$$(p<q \bigvee(p=q \wedge|z|<1)) \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \wedge j \neq k \wedge 1 \leq j \leq q \wedge 1 \leq k \leq q}\left(b_j-b_k \notin \mathbb{Z}\right)$$

07.34.13.0005.01

$$W_z\left(z^{b_1} {}_pF_{q-1}\left(1-a_1+b_1, \ldots, 1-a_p+b_1; 1+b_1-b_2, \ldots, 1+b_1-b_q, (-1)^{p-m-n} z\right), \ldots,\right.$$
$$z^{b_k} {}_pF_{q-1}\left(1-a_1+b_k, \ldots, 1-a_p+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_q+b_k; (-1)^{p-m-n} z\right),$$
$$\left.\ldots, z^{b_q} {}_pF_{q-1}\left(1-a_1+b_q, \ldots, 1-a_p+b_q; 1+b_q-b_1, \ldots, 1+b_q-b_{q-1}, (-1)^{p-m-n} z\right)\right) ==$$
$$-\prod_{k=1}^{q} \prod_{j=1}^{k-1}\left(b_j-b_k\right) z^{-\left(\frac{1}{2} q(q-1)-\sum_{k=1}^{q} b_k\right)}\left(\delta_{p,q}\left(1-(-1)^{m+n-q} z\right)^{-q+\sum_{l=1}^{q} a_l-\sum_{k=1}^{q} b_k}+e^{-(-1)^{m+n-q} z} \delta_{p,q-1}+\theta(q-p-2)\right)$$

Representation of fundamental system solutions near point $z == (-1)^{m+n-p}$ for $p == q$ in the general case

Below representation include functions of two kinds. The function $G_{q,q}^{q,0}\left((-1)^{q-m-n} z \,\middle|\, \begin{matrix} a_1, \ldots, a_q \\ b_1, \ldots, b_q \end{matrix}\right)$ is the piecewise analytical function with discontinuity on the unit circle $|z| == 1$. It has a singularity near point $z == (-1)^{m+n-q}$of the form const $(1-z_1)^{\psi_q}\,(1+O(z_1-1))$ /; $z_1 == (-1)^{q-m-n} z$, when $|z|<1$. The functions $G_{q+2,q+2}^{2,q+2}\left((-1)^{q-m-n} z \,\middle|\, \begin{matrix} b_h, b_j, a_1, \ldots, a_q \\ b_h, b_j, b_1, \ldots, b_q \end{matrix}\right)$ are the analytical functions and are bounded near point $z_1 == 1$.

07.34.13.0002.01

$$\left((-1)^{m+n-q} z \prod_{l=1}^{q}\left(z \frac{d}{dz}+1-a_l\right)-\prod_{k=1}^{q}\left(z \frac{d}{dz}-b_k\right)\right) w(z) == 0 \text{ /; }$$

$$\left(w(z) == c_j\, G_{q,q}^{q,0}\left((-1)^{q-m-n} z \,\middle|\, \begin{matrix} a_1, \ldots, a_q \\ b_1, \ldots, b_q \end{matrix}\right)+\sum_{h=1}^{q} c_h\left(1-\delta_{h-j}\right) G_{q+2,q+2}^{2,q+2}\left((-1)^{q-m-n} z \,\middle|\, \begin{matrix} b_h, b_j, a_1, \ldots, a_q \\ b_h, b_j, b_1, \ldots, b_q \end{matrix}\right) \text{ /; }\right.$$

$$\left.|z|<1 \bigwedge\left(\psi_q == -\mu == \sum_{j=1}^{q}\left(a_j-b_j\right)-1 \text{ /; } p == q\right) \bigwedge \psi_q \notin \mathbb{Z} \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq q \land 1 \leq k \leq q}\left(b_j-b_k \notin \mathbb{Z}\right) \bigwedge 1 \leq j \leq q\right)$$

Representation of fundamental system solutions near point $z == \tilde{\infty}$ for $p \geq q$ in the general case

07.34.13.0003.01

$$\left((-1)^{m+n-p} z \prod_{l=1}^{p}\left(z \frac{d}{dz}+1-a_l\right)-\prod_{k=1}^{q}\left(z \frac{d}{dz}-b_k\right)\right) w(z) == 0 \text{ /; }$$

$$w(z) == c_1\, G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)+\sum_{k=2}^{p} c_k\, G_{q,p}^{1,q}\left(\frac{(-1)^{1-m-n+q}}{z} \,\middle|\, \begin{matrix} 1-b_1, \ldots, 1-b_q \\ 1-a_k, 1-a_1, \ldots, 1-a_{k-1}, 1-a_{k+1}, \ldots, 1-a_p \end{matrix}\right) \bigwedge$$

$$p \geq q \bigwedge \forall_{\{j,k\},\{j,k\} \in \mathbb{Z} \land j \neq k \land 1 \leq j \leq p \land 1 \leq k \leq p}\left(a_j-a_k \notin \mathbb{Z}\right)$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

07.34.16.0001.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} \alpha+a_1, \ldots, \alpha+a_n, \alpha+a_{n+1}, \ldots, \alpha+a_p \\ \alpha+b_1, \ldots, \alpha+b_m, \alpha+b_{m+1}, \ldots, \alpha+b_q \end{matrix}\right) == z^{\alpha}\, G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$$

07.34.16.0002.01

$$G_{p,q}^{m,n}\left(\frac{1}{z} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) == G_{q,p}^{n,m}\left(z \,\middle|\, \begin{matrix} 1-b_1, \ldots, 1-b_m, 1-b_{m+1}, \ldots, 1-b_q \\ 1-a_1, \ldots, 1-a_n, 1-a_{n+1}, \ldots, 1-a_p \end{matrix}\right) \text{ /; } z \notin \mathbb{R}$$

Products, sums, and powers of the direct function

Products of the direct function

07.34.16.0003.01

$$G_{p_1,q_1}^{m_1,n_1}\left(z \,\middle|\, \begin{array}{c} a_{11}, \ldots, a_{1\,n_1}, a_{1\,n_1+1}, \ldots, a_{1\,p_1} \\ b_{11}, \ldots, b_{1\,m_1}, b_{1\,m_1+1}, \ldots, b_{1\,q_1} \end{array}\right) G_{p_2,q_2}^{m_2,n_2}\left(w \,\middle|\, \begin{array}{c} a_{21}, \ldots, a_{2\,n_2}, a_{2\,n_2+1}, \ldots, a_{2\,p_2} \\ b_{21}, \ldots, b_{2\,m_2}, b_{2\,m_2+1}, \ldots, b_{2\,q_2} \end{array}\right) = G_{0,0:p_1,q_1:p_2,q_2}^{0,0:m_1,n_1:m_2,n_2}\left(\,\middle|\, \begin{array}{ccc} a_{11}, & \ldots, & a_{1\,p_1} \\ b_{11}, & \ldots, & b_{1\,q_1} \end{array} \,\middle|\, \begin{array}{ccc} a_{21}, & \ldots, & a_{2\,p_2} \\ b_{21}, & \ldots, & b_{2\,q_2} \end{array} \,\middle|\, z, w\right)$$

Sums of the direct function

07.34.16.0004.01

$$\cos((b_1 - b_{m+1})\,\pi)\, G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) - G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_{m+1}, b_2, \ldots, b_1,, b_{m+2}, \ldots, b_q \end{array}\right) = \sin((b_1 - b_{m+1})\,\pi)\, G_{p+1,q+1}^{m+1,n}\left(z \,\middle|\, \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p, b_{m+1} - \frac{1}{2} \\ b_1, \ldots, b_m, b_{m+1}, b_{m+2}, \ldots, b_q, b_{m+1} - \frac{1}{2} \end{array}\right)$$

07.34.16.0005.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a_1, \ldots, a_n, b_1 + \frac{1}{2}, a_{n+2}, \ldots, a_p \\ b_1, \ldots, b_m, b_1 + \frac{1}{2}, b_{m+2}, \ldots, b_q \end{array}\right) - G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a_1, \ldots, a_n, b_{m+2} + \frac{1}{2}, a_{n+2}, \ldots, a_p \\ b_{m+2}, b_2, \ldots, b_m, b_1, b_{m+2} + \frac{1}{2}, b_{m+3}, \ldots, b_q \end{array}\right) = \frac{\sin((b_{m+2} - b_1)\,\pi)}{\pi^2}\, G_{p-1,q-1}^{m+1,n}\left(z \,\middle|\, \begin{array}{c} a_1, \ldots, a_n, a_{n+2}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+2}, b_{m+3}, \ldots, b_q \end{array}\right)$$

Identities

Recurrence identities

Consecutive neighbors

07.34.17.0001.01

$$(b - a + 1)\, G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b, b_2, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a - 1, a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b, b_2, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) + G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b + 1, b_2, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right)$$

07.34.17.0002.01

$$(c - a)\, G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c - 1 \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) + G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a - 1, a_2, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right)$$

07.34.17.0003.01

$$(c - a)\, G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) = G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c - 1 \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right) + G_{p,q}^{m,n}\left(z \,\middle|\, \begin{array}{c} a - 1, a_2, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right)$$

Distant neighbors

07.34.17.0004.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1},\,c\\ c+l,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=(-1)^l\sum_{j=1}^{l}\binom{l}{j}(a-c-l)_{l-j}\,G_{p-1,q-1}^{m-1,n}\left(z\,\middle|\,\begin{matrix}a-j,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1}\\ b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\,/;\,l\in\mathbb{N}^+$$

Functional identities

Relations between contiguous functions

07.34.17.0005.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_{q-1},\,a+l\end{matrix}\right)=(-1)^l\,G_{p,q}^{m+1,n-1}\left(z\,\middle|\,\begin{matrix}a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,a\\ a+l,\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_{q-1}\end{matrix}\right)\,/;\,l\in\mathbb{Z}$$

07.34.17.0006.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1},\,a\\ a+l,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=(-1)^l\,G_{p,q}^{m-1,n+1}\left(z\,\middle|\,\begin{matrix}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q,\,a+l\end{matrix}\right)\,/;\,l\in\mathbb{Z}$$

07.34.17.0007.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1},\,a+l\\ a,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=(-1)^l\,G_{p-1,q-1}^{m-1,n}\left(z\,\middle|\,\begin{matrix}a+l,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1}\\ b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\,/;\,l\in\mathbb{Z}$$

Relations of special kind

07.34.17.0008.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1},\,c\\ c+1,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=$$
$$(c-a+1)\,G_{p-1,q-1}^{m-1,n}\left(z\,\middle|\,\begin{matrix}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1}\\ b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)-G_{p-1,q-1}^{m-1,n}\left(z\,\middle|\,\begin{matrix}a-1,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1}\\ b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)$$

07.34.17.0009.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ 0,\,\frac{1}{2},\,b_3,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=$$
$$\pi\,G_{p,q}^{m-1,n}\left(-z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ 0,\,b_3,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q,\,\frac{1}{2}\end{matrix}\right)+i\,\pi\,G_{p,q}^{m-1,n}\left(-z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ \frac{1}{2},\,b_3,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q,\,0\end{matrix}\right)\,/;\,-\pi<\arg(z)\leq 0$$

07.34.17.0010.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a+b\,i,\,a-i\,b,\,a_3,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=\frac{\pi\,i\,e^{-i\,a\,\pi}}{\sinh(2\,b\,\pi)}\left(e^{b\,\pi}\,G_{p,q}^{m,n-1}\left(-z\,\middle|\,\begin{matrix}a+b\,i,\,a_3,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,a-i\,b\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)-\right.$$
$$\left.e^{-b\,\pi}\,G_{p,q}^{m,n-1}\left(-z\,\middle|\,\begin{matrix}a-i\,b,\,a_3,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,a+b\,i\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\right)\,/;\,-\pi<\arg(z)\leq 0$$

General cases

07.34.17.0011.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=z^{-\alpha}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}\alpha+a_1,\,\ldots,\,\alpha+a_n,\,\alpha+a_{n+1},\,\ldots,\,\alpha+a_p\\ \alpha+b_1,\,\ldots,\,\alpha+b_m,\,\alpha+b_{m+1},\,\ldots,\,\alpha+b_q\end{matrix}\right)$$

07.34.17.0012.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=G_{q,p}^{n,m}\left(\frac{1}{z}\,\middle|\,\begin{matrix}1-b_1,\,\ldots,\,1-b_m,\,1-b_{m+1},\,\ldots,\,1-b_q\\ 1-a_1,\,\ldots,\,1-a_n,\,1-a_{n+1},\,\ldots,\,1-a_p\end{matrix}\right)\,/;\,z\notin(-\infty,0)$$

07.34.17.0018.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\ldots,a_n,a_{n+1},\ldots,a_p\\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right)=G_{q,p}^{n,m}\left(\frac{e^{-2\pi i\left\lfloor\frac{\pi+\arg(z)}{2\pi}\right\rfloor}}{z}\,\middle|\,\begin{matrix}1-b_1,\ldots,1-b_m,1-b_{m+1},\ldots,1-b_q\\ 1-a_1,\ldots,1-a_n,1-a_{n+1},\ldots,1-a_p\end{matrix}\right)\text{ /; }$$

$$p\neq q\bigvee p=q\bigwedge z\notin(-1,0)$$

07.34.17.0013.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\ldots,a_n,a_{n+1},\ldots,a_p\\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right)=$$

$$(2\pi)^{-(k-1)c^*}k^\mu G_{k\,p,k\,q}^{k\,m,k\,n}\left(\frac{z^k}{k^{k(q-p)}}\,\middle|\,\begin{matrix}\frac{a_1}{k},\ldots,\frac{k+a_1-1}{k},\ldots,\frac{a_n}{k},\ldots,\frac{k+a_n-1}{k},\frac{a_{n+1}}{k},\ldots,\frac{k+a_{n+1}-1}{k},\ldots,\frac{a_p}{k},\ldots,\frac{k+a_p-1}{k}\\ \frac{b_1}{k},\ldots,\frac{k+b_1-1}{k},\ldots,\frac{b_m}{k},\ldots,\frac{k+b_m-1}{k},\frac{b_{m+1}}{k},\ldots,\frac{k+b_{m+1}-1}{k},\ldots,\frac{b_q}{k},\ldots,\frac{k+b_q-1}{k}\end{matrix}\right)\text{ /; }$$

$$c^*=m+n-\frac{p+q}{2}\bigwedge\mu=\sum_{k=1}^q b_k-\sum_{k=1}^p a_k+\frac{p-q}{2}+1\bigwedge k\in\mathbb{N}^+$$

07.34.17.0014.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\ldots,a_n,a_{n+1},\ldots,a_p\\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right)=$$

$$\pi^{m+n-p}\sum_{k=1}^m\frac{\prod_{j=n+1}^p\sin\left(\left(a_j-b_k\right)\pi\right)}{\left(\prod_{j=1}^{k-1}\sin\left(\left(b_j-b_k\right)\pi\right)\right)\prod_{j=k+1}^m\sin\left(\left(b_j-b_k\right)\pi\right)}e^{\pi i(m+n-p-1)b_k}G_{p,q}^{1,p}\left((-1)^{p-m-n+1}z\,\middle|\,\begin{matrix}a_1,\ldots,a_p\\ b_k,b_1,\ldots,b_{k-1},b_{k+1},\ldots,b_q\end{matrix}\right)$$

07.34.17.0015.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\ldots,a_n,a_{n+1},\ldots,a_p\\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right)=$$

$$\pi^{m+n-q}\sum_{k=1}^n\frac{\prod_{j=m+1}^q\sin\left(\left(a_k-b_j\right)\pi\right)}{\left(\prod_{j=1}^{k-1}\sin\left(\left(a_k-a_j\right)\pi\right)\right)\prod_{j=k+1}^n\sin\left(\left(a_k-a_j\right)\pi\right)}e^{\pi i(m+n-q-1)\left(a_k-1\right)}G_{p,q}^{q,1}\left((-1)^{q-m-n+1}z\,\middle|\,\begin{matrix}a_k,a_1,\ldots,a_{k-1},a_{k+1},\ldots,a_p\\ b_1,\ldots,b_q\end{matrix}\right)$$

07.34.17.0016.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\ldots,a_n,a_{n+1},\ldots,a_q\\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right)=$$

$$\frac{\pi^{m+n-q}}{\sin\left(\pi\,\psi_q\right)}\sum_{h=1}^m\frac{e^{(m+n-q)b_h\pi i}\prod_{k=n+1}^q\sin((a_k-b_h)\pi)}{\left(\prod_{k=1}^{h-1}\sin((b_k-b_h)\pi)\right)\prod_{k=h+1}^m\sin((b_k-b_h)\pi)}G_{q+2,q+2}^{1,q+1}\left((-1)^{q-m-n}z\,\middle|\,\begin{matrix}b_h,a_1,\ldots,a_q,b_h+\psi_q\\ b_h,b_1,\ldots,b_q,b_h+\psi_q\end{matrix}\right)\text{ /; }$$

$$|z|<1\bigwedge\psi_q=\sum_{k=1}^q(a_k-b_k)-1\bigwedge\psi_q\notin\mathbb{Z}$$

07.34.17.0017.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\ldots,a_n,a_{n+1},\ldots,a_q\\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right)=$$

$$\frac{\pi^{m+n-q}}{\sin\left(\pi\,\psi_q\right)}\sum_{h=1}^n\frac{e^{(m+n-q)\left(1-a_h\right)\pi i}\prod_{k=m+1}^q\sin((a_h-b_k)\pi)}{\left(\prod_{k=1}^{h-1}\sin((a_h-a_k)\pi)\right)\prod_{k=h+1}^n\sin((a_h-a_k)\pi)}G_{q+2,q+2}^{q+1,1}\left((-1)^{m+n-q}z\,\middle|\,\begin{matrix}a_h,a_1,\ldots,a_q,a_h+\psi_q\\ a_h,b_1,\ldots,b_q,a_h+\psi_q\end{matrix}\right)\text{ /; }$$

$$|z|>1\bigwedge\psi_q=\sum_{k=1}^q(a_k-b_k)-1\bigwedge\psi_q\notin\mathbb{Z}$$

Relations with cut through poles

07.34.17.0019.01

$$G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) =$$

$$(-1)^{\sum_{r=1}^{n} \text{ac}_r + \sum_{k=1}^{m} \text{bc}_k} G_{n+m+p,n+m+q}^{n+m,n+m}\left(z \middle| \begin{matrix} a_1 - \text{ac}_1, \ldots, a_n - \text{ac}_n, b_1 + \text{bc}_1, \ldots, b_m + \text{bc}_m, a_1, \ldots, a_p \\ a_1 - \text{ac}_1, \ldots, a_n - \text{ac}_n, b_1 + \text{bc}_1, \ldots, b_m + \text{bc}_m, b_1, \ldots, b_q \end{matrix}\right) -$$

$$\sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{n} \Gamma(a_k - a_j)}{\prod_{j=m+1}^{q} \Gamma(a_k - b_j)} z^{a_k - 1} \sum_{i=0}^{\lfloor \gamma + \text{Re}(a_k) \rfloor - 1} \frac{\left(\prod_{j=1}^{m} \Gamma(i - a_k + b_j + 1)\right) \prod_{j=m+1}^{q} (-a_k + b_j + 1)_i}{\left(\prod_{j=1}^{n} (a_j - a_k + 1)_i\right) \prod_{j=n+1}^{p} \Gamma(i + a_j - a_k + 1)} \left(\frac{(-1)^{-m-n+q}}{z}\right)^i +$$

$$\sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j \neq k}}^{m} \Gamma(b_j - b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k)} z^{b_k} \sum_{i=0}^{\lfloor -\gamma - \text{Re}(b_k) \rfloor} \frac{\left(\prod_{j=1}^{n} \Gamma(i - a_j + b_k + 1)\right) \prod_{j=n+1}^{p} (-a_j + b_k + 1)_i}{\left(\prod_{j=1}^{m} (-b_j + b_k + 1)_i\right) \prod_{j=m+1}^{q} \Gamma(i - b_j + b_k + 1)} \left((-1)^{-m-n+p} z\right)^i \;/;\; \text{ac}_k =$$

$$\theta(\lfloor \gamma + \text{Re}(a_k) \rfloor) \lfloor \gamma + \text{Re}(a_k) \rfloor \bigwedge \text{bc}_k = \theta(\lfloor -\gamma - \text{Re}(b_k) \rfloor + 1) (\lfloor -\gamma - \text{Re}(b_k) \rfloor + 1)$$

Differentiation

Low-order differentiation

With respect to z

07.34.20.0001.01

$$\frac{\partial G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z} = G_{p+1,q+1}^{m,n+1}\left(z \middle| \begin{matrix} -1, a_1 - 1, \ldots, a_n - 1, a_{n+1} - 1, \ldots, a_p - 1 \\ b_1 - 1, \ldots, b_m - 1, 0, b_{m+1} - 1, \ldots, b_q - 1 \end{matrix}\right)$$

07.34.20.0002.01

$$\frac{\partial G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z} = \frac{1}{z} G_{p+1,q+1}^{m,n+1}\left(z \middle| \begin{matrix} 0, a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, 1, b_{m+1}, \ldots, b_q \end{matrix}\right)$$

07.34.20.0003.01

$$\frac{\partial G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z} = (a_1 - 1) G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) + G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1 - 1, a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)$$

07.34.20.0004.01

$$\frac{\partial^2 G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z^2} = G_{p+1,q+1}^{m,n+1}\left(z \middle| \begin{matrix} -2, a_1 - 2, \ldots, a_n - 2, a_{n+1} - 2, \ldots, a_p - 2 \\ b_1 - 2, \ldots, b_m - 2, 0, b_{m+1} - 2, \ldots, b_q - 2 \end{matrix}\right)$$

07.34.20.0005.01

$$\frac{\partial \left(z^\alpha G_{p,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)\right)}{\partial z} = z^{\alpha-1} G_{p+1,q+1}^{m,n+1}\left(z \middle| \begin{matrix} -\alpha, a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q, 1 - \alpha \end{matrix}\right)$$

07.34.20.0006.01

$$\frac{\partial\left(z^{\alpha}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)\right)}{\partial z}=-z^{\alpha-1}\,G_{p+1,q+1}^{m+1,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,-\alpha\\ 1-\alpha,\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)$$

07.34.20.0007.01

$$\frac{\partial\left(z^{\alpha}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)\right)}{\partial z}=$$
$$z^{\alpha-1}\left((\alpha+b_1)\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)-G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1+1,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)\right)$$

07.34.20.0008.01

$$\frac{\partial\left(z^{1-a}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)\right)}{\partial z}=z^{-a}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a-1,\,a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)$$

07.34.20.0009.01

$$\frac{\partial\left(z^{1-c}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1},\,c\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)\right)}{\partial z}=-z^{-c}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1},\,c-1\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)$$

07.34.20.0010.01

$$\frac{\partial\left(z^{-d}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_{q-1},\,d\end{array}\right)\right)}{\partial z}=z^{-d-1}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_{q-1},\,d+1\end{array}\right)$$

Symbolic differentiation

With respect to z

07.34.20.0011.02

$$\frac{\partial^u G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)}{\partial z^u}=G_{p+1,q+1}^{m,n+1}\left(z\,\middle|\,\begin{array}{c}-u,\,a_1-u,\,\ldots,\,a_n-u,\,a_{n+1}-u,\,\ldots,\,a_p-u\\ b_1-u,\,\ldots,\,b_m-u,\,0,\,b_{m+1}-u,\,\ldots,\,b_q-u\end{array}\right)/;\,u\in\mathbb{N}$$

07.34.20.0012.02

$$\frac{\partial^u G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)}{\partial z^u}=z^{-u}\,G_{p+1,q+1}^{m,n+1}\left(z\,\middle|\,\begin{array}{c}0,\,a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,u,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)/;\,u\in\mathbb{N}$$

07.34.20.0013.02

$$\frac{\partial^u\left(z^{-b}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)\right)}{\partial z^u}=(-1)^u\,z^{-b-u}\,G_{p,q}^{m,n}\left(z\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b+u,\,b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)/;\,u\in\mathbb{N}$$

07.34.20.0014.02

$$\frac{\partial^u G_{p,q}^{m,n}\left(\frac{1}{z}\,\middle|\,\begin{array}{c}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)}{\partial z^u}=(-1)^u\,z^{-u}\,G_{p+1,q+1}^{m,n+1}\left(\frac{1}{z}\,\middle|\,\begin{array}{c}1-u,\,a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,1,\,b_{m+1},\,\ldots,\,b_q\end{array}\right)/;\,u\in\mathbb{N}$$

07.34.20.0015.02

$$\frac{\partial^u \left(z^{a-1}\, G_{p,q}^{m,n}\!\left(\frac{1}{z} \,\middle|\, \begin{matrix} a, a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)\right)}{\partial z^u} = (-1)^u\, z^{a-u-1}\, G_{p,q}^{m,n}\!\left(\frac{1}{z} \,\middle|\, \begin{matrix} a-u, a_2, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /;\ u \in \mathbb{N}$$

07.34.20.0016.02

$$\frac{\partial^u \left(z^{c-1}\, G_{p,q}^{m,n}\!\left(\frac{1}{z} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)\right)}{\partial z^u} = z^{c-u-1}\, G_{p,q}^{m,n}\!\left(\frac{1}{z} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{p-1}, c-u \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /;\ u \in \mathbb{N}$$

07.34.20.0017.02

$$\frac{\partial^u G_{p,q}^{m,n}\!\left(w\, z^{r/l} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z^u} = (2\,\pi)^{-(l-1)\,c^*}\, l^\mu\, r^u\, z^{-u}$$

$$G_{l\,p+r,l\,q+r}^{l\,m,l\,n+r}\!\left(w^l\, l^{l\,(p-q)}\, z^r \,\middle|\, \begin{matrix} 0, \frac{1}{r}, \ldots, \frac{r-1}{r}, \frac{a_1}{l}, \ldots, \frac{l+a_1-1}{l}, \ldots, \frac{a_n}{l}, \ldots, \frac{l+a_n-1}{l}, \frac{a_{n+1}}{l}, \ldots, \frac{l+a_{n+1}-1}{l}, \ldots, \frac{a_p}{l}, \ldots, \frac{l+a_p-1}{l} \\ \frac{b_1}{l}, \ldots, \frac{l+b_1-1}{l}, \ldots, \frac{b_m}{l}, \ldots, \frac{l+b_m-1}{l}, \frac{u}{r}, \ldots, \frac{r+u-1}{r}, \frac{b_{m+1}}{l}, \ldots, \frac{l+b_{m+1}-1}{l}, \ldots, \frac{b_q}{l}, \ldots, \frac{l+b_q-1}{l} \end{matrix}\right) /;$$

$$u \in \mathbb{N} \bigwedge c^* = m+n-\frac{p+q}{2} \bigwedge \mu = \sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j + \frac{p-q}{2} + 1$$

07.34.20.0018.02

$$\frac{\partial^u G_{p,q}^{m,n}\!\left(\frac{w}{z^{r/l}} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z^u} = (2\,\pi)^{-(l-1)\,c^*}\, l^\mu\, r^u\, z^{-u}$$

$$G_{l\,p+r,l\,q+r}^{l\,m+r,l\,n}\!\left(\frac{w^l\, l^{l\,(p-q)}}{z^r} \,\middle|\, \begin{matrix} \frac{a_1}{l}, \ldots, \frac{l+a_1-1}{l}, \ldots, \frac{a_n}{l}, \ldots, \frac{l+a_n-1}{l}, \frac{1-u}{r}, \ldots, \frac{r-u+1-1}{r}, \frac{a_{n+1}}{l}, \ldots, \frac{l+a_{n+1}-1}{l}, \ldots, \frac{a_p}{l}, \ldots, \frac{l+a_p-1}{l} \\ \frac{1}{r}, \ldots, \frac{r}{r}, \frac{b_1}{l}, \ldots, \frac{l+b_1-1}{l}, \ldots, \frac{b_m}{l}, \ldots, \frac{l+b_m-1}{l}, \frac{b_{m+1}}{l}, \ldots, \frac{l+b_{m+1}-1}{l}, \ldots, \frac{b_q}{l}, \ldots, \frac{l+b_q-1}{l} \end{matrix}\right) /;$$

$$u \in \mathbb{N} \bigwedge c^* = m+n-\frac{p+q}{2} \bigwedge \mu = \frac{p-q}{2} - \sum_{j=1}^{p} a_j + \sum_{j=1}^{q} b_j + 1$$

Fractional integro-differentiation

With respect to *z*

07.34.20.0019.01

$$\frac{\partial^\alpha G_{p,q}^{m,n}\!\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right)}{\partial z^\alpha} = G_{p+1,q+1}^{m,n+1}\!\left(z \,\middle|\, \begin{matrix} -\alpha, a_1-\alpha, \ldots, a_n-\alpha, a_{n+1}-\alpha, \ldots, a_p-\alpha \\ b_1-\alpha, \ldots, b_m-\alpha, 0, b_{m+1}-\alpha, \ldots, b_q-\alpha \end{matrix}\right)$$

Integration

Indefinite integration

Involving only one direct function

07.34.21.0001.01

$$\int G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) dz = G_{p+1,q+1}^{m,n+1}\left(z \,\middle|\, \begin{matrix} 1, a_1+1, \ldots, a_n+1, a_{n+1}+1, \ldots, a_p+1 \\ b_1+1, \ldots, b_m+1, 0, b_{m+1}+1, \ldots, b_q+1 \end{matrix}\right)$$

Involving one direct function and elementary functions

Involving power function

07.34.21.0002.01

$$\int z^{\alpha-1} G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) dz = G_{p+1,q+1}^{m,n+1}\left(z \,\middle|\, \begin{matrix} 1, \alpha+a_1, \ldots, \alpha+a_n, \alpha+a_{n+1}, \ldots, \alpha+a_p \\ \alpha+b_1, \ldots, \alpha+b_m, 0, \alpha+b_{m+1}, \ldots, \alpha+b_q \end{matrix}\right)$$

07.34.21.0003.01

$$\int z^{\alpha-1} G_{p,q}^{m,n}\left(z\,w \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) dz = z^{\alpha} G_{p+1,q+1}^{m,n+1}\left(z\,w \,\middle|\, \begin{matrix} 1-\alpha, a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q, -\alpha \end{matrix}\right)$$

07.34.21.0004.01

$$\int z^{\alpha-1} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) dz = z^{\alpha} G_{5,5}^{2,3}\left(w\,z \,\middle|\, \begin{matrix} 1-\alpha, a_1, a_2, a_3, a_4 \\ b_1, b_2, -\alpha, b_3, b_4 \end{matrix}\right)$$

07.34.21.0005.01

$$\int z^{-a_1-1} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) dz = z^{-a_1} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1+1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right)$$

07.34.21.0006.01

$$\int z^{-a_4-1} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) dz = z^{-a_4} G_{5,5}^{2,3}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_4+1, a_3, a_4 \\ b_1, b_2, a_4, b_3, b_4 \end{matrix}\right)$$

07.34.21.0007.01

$$\int z^{-b_1} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) dz = z^{1-b_1} G_{5,5}^{2,3}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, b_1, a_3, a_4 \\ b_1, b_2, b_1-1, b_3, b_4 \end{matrix}\right)$$

07.34.21.0008.01

$$\int z^{-b_4} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4 \end{matrix}\right) dz = z^{1-b_4} G_{4,4}^{2,2}\left(w\,z \,\middle|\, \begin{matrix} a_1, a_2, a_3, a_4 \\ b_1, b_2, b_3, b_4-1 \end{matrix}\right)$$

Definite integration

Classical and generalized Meijer's integrals from one G function

07.34.21.0009.01

$$\int_0^\infty t^{\alpha-1} G_{p,q}^{m,n}\left(t z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) dt = \frac{\prod_{k=1}^m \Gamma(\alpha + b_k) \prod_{k=1}^n \Gamma(1-\alpha-a_k)}{\prod_{k=n+1}^p \Gamma(\alpha + a_k) \prod_{k=m+1}^q \Gamma(1-\alpha-b_k)} z^{-\alpha} \;/;\; c^* = m + n - \frac{p+q}{2} \bigwedge$$

$$m^2 + n^2 > 0 \bigwedge z \neq 0 \bigwedge \Big((c^* > 0 \wedge |\arg(z)| < c^* \pi \wedge -\min(\mathrm{Re}(b_1), \ldots, \mathrm{Re}(b_m)) < \mathrm{Re}(\alpha) < 1 - \max(\mathrm{Re}(a_1), \ldots, \mathrm{Re}(a_n))) \bigvee$$

$$\Big(p \neq q \bigwedge c^* \geq 0 \bigwedge |\arg(z)| = c^* \pi \bigwedge -\min(\mathrm{Re}(b_1), \ldots, \mathrm{Re}(b_m)) < \mathrm{Re}(\alpha) < 1 - \max(\mathrm{Re}(a_1), \ldots, \mathrm{Re}(a_n)) \bigwedge$$

$$\mathrm{Re}((q-p)\alpha + \mu) < \frac{3}{2} \bigwedge \mu = \sum_{j=1}^q b_j - \sum_{j=1}^p a_j + \frac{p-q}{2} + 1\Big) \bigvee \Big(p = q \bigwedge c^* = 0 \bigwedge z > 0 \bigwedge$$

$$-\min(\mathrm{Re}(b_1), \ldots, \mathrm{Re}(b_m)) < \mathrm{Re}(\alpha) < 1 - \max(\mathrm{Re}(a_1), \ldots, \mathrm{Re}(a_n)) \bigwedge \mathrm{Re}\left(\sum_{j=1}^q (b_j - a_j)\right) < 0\Big)\Big)$$

07.34.21.0010.01

$$\int_0^\infty t^{\alpha-1} G_{0,0}^{0,0}\left(t x \middle| \right) dt = x^{-\alpha} \;/;\; x > 0$$

Above G function does not have parameters and by this reason it coinsides with Dirac delta function $G_{0,0}^{0,0}\left(t x \middle| \right) = \delta(t x - 1)$. So the last relation is correct only in the class of generalized functions.

Classical Meijer's integral from two G functions

07.34.21.0011.01

$$\int_0^\infty \tau^{\alpha-1} G_{u,v}^{s,t}\left(\tau w \middle| \begin{matrix} c_1, \ldots, c_t, c_{t+1}, \ldots, c_u \\ d_1, \ldots, d_s, d_{s+1}, \ldots, d_v \end{matrix}\right) G_{p,q}^{m,n}\left(\tau z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau =$$

$$w^{-\alpha} G_{v+p,u+q}^{m+t,n+s}\left(\frac{z}{w} \middle| \begin{matrix} a_1, \ldots, a_n, 1-\alpha-d_1, \ldots, 1-\alpha-d_s, 1-\alpha-d_{s+1}, \ldots, 1-\alpha-d_v, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, 1-\alpha-c_1, \ldots, 1-\alpha-c_t, 1-\alpha-c_{t+1}, \ldots, 1-\alpha-c_u, b_{m+1}, \ldots, b_q \end{matrix}\right) \;/;\; (\mathbb{CC} \;/;\; k = l = 1)$$

Remark: The conditions $\mathbb{CC}$ are described at next subsubsection.

Generalization of classical Meijer's integral from two G functions

Main formulas

07.34.21.0012.01

$$\int_0^\infty \tau^{\alpha-1} G_{u,v}^{s,t}\left(\sigma \tau \middle| \begin{matrix} c_1, & c_2, & \ldots, & c_u \\ d_1, & d_2, & \ldots, & d_v \end{matrix}\right) G_{p,q}^{m,n}\left(\omega \tau^r \middle| \begin{matrix} a_1, & a_2, & \ldots, & a_p \\ b_1, & b_2, & \ldots, & b_q \end{matrix}\right) d\tau =$$

$$\sigma^{-\alpha} H_{p+v,q+u}^{m+t,n+s}\left(\frac{\omega}{\sigma^r} \middle| \begin{matrix} (a_1, 1), & \ldots, & (a_n, 1), & (1-\alpha-d_1, r), & \ldots, & (1-\alpha-d_v, r), & (a_{n+1}, 1), & \ldots, & (a_p, 1) \\ (b_1, 1), & \ldots, & (b_m, 1), & (1-\alpha-c_1, r), & \ldots, & (1-\alpha-c_u, r), & (b_{m+1}, 1), & \ldots, & (b_q, 1) \end{matrix}\right). \;/;\; r > 0$$

Remark: This relationship only holds true when the parameters satisfy certain well-specified restrictions. In the case of rational $r = \frac{l}{k} \in \mathbb{Q}$ this integral and corresponding Fox H function can be represented through Meijer G function by the following formula:

07.34.21.0013.01

$$\int_0^\infty \tau^{\alpha-1}\, G_{u,v}^{s,t}\!\left(\sigma\,\tau \,\middle|\, \begin{matrix} c_1,\,\ldots,\,c_t,\,c_{t+1},\,\ldots,\,c_u \\ d_1,\,\ldots,\,d_s,\,d_{s+1},\,\ldots,\,d_v \end{matrix}\right) G_{p,q}^{m,n}\!\left(\omega\,\tau^{l/k} \,\middle|\, \begin{matrix} a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p \\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q \end{matrix}\right) d\tau = \frac{k^\mu\, l^{(v-u)\,\alpha+\rho-1}}{(2\,\pi)^{(l-1)\,b^*+(k-1)\,c^*}}\,\sigma^{-\alpha}$$

$$G_{k\,p+l\,v,k\,q+l\,u}^{k\,m+l\,t,k\,n+l\,s}\!\left(\frac{\omega^k\,k^{k\,(p-q)}}{\sigma^l\,l^{l\,(u-v)}} \,\middle|\, \begin{matrix} \frac{a_1}{k},\,\ldots,\,\frac{a_1+k-1}{k},\,\ldots,\,\frac{a_n}{k},\,\ldots,\,\frac{a_n+k-1}{k},\,\frac{1-\alpha-d_1}{l},\,\ldots,\,\frac{l-\alpha-d_1}{l},\,\ldots,\,\frac{1-\alpha-d_s}{l},\,\ldots,\,\frac{l-\alpha-d_s}{l},\,\frac{1-\alpha-d_{s+1}}{l},\,\ldots,\,\frac{l-\alpha-d_{s+1}}{l},\,\ldots, \\ \frac{b_1}{k},\,\ldots,\,\frac{b_1+k-1}{k},\,\ldots,\,\frac{b_m}{k},\,\ldots,\,\frac{b_m+k-1}{k},\,\frac{1-\alpha-c_1}{l},\,\ldots,\,\frac{l-\alpha-c_1}{l},\,\ldots,\,\frac{1-\alpha-c_t}{l},\,\ldots,\,\frac{l-\alpha-c_t}{l},\,\frac{1-\alpha-c_{t+1}}{l},\,\ldots,\,\frac{l-\alpha-c_{t+1}}{l},\,\ldots, \end{matrix}\right.$$

$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k,\,l) = 1 \bigwedge \mathbb{CC}$

where

07.34.21.0014.01

$$\mathbb{CC} = (\mathbb{C}_1 \vee \mathbb{C}_2 \vee \mathbb{C}_3 \vee \mathbb{C}_4 \vee \mathbb{C}_5 \vee \mathbb{C}_6 \vee \mathbb{C}_7 \vee \mathbb{C}_8 \vee \mathbb{C}_9 \vee \mathbb{C}_{10} \vee \mathbb{C}_{11} \vee \mathbb{C}_{12} \vee \mathbb{C}_{13} \vee \mathbb{C}_{14} \vee \mathbb{C}_{15} \vee \mathbb{C}_{16} \vee \mathbb{C}_{17} \vee \mathbb{C}_{18} \vee \mathbb{C}_{19} \vee \mathbb{C}_{20} \vee \mathbb{C}_{21} \vee \mathbb{C}_{22} \vee \mathbb{C}_{23} \vee \mathbb{C}_{24} \vee \mathbb{C}_{25} \vee \mathbb{C}_{26} \vee \mathbb{C}_{27} \vee \mathbb{C}_{28} \vee \mathbb{C}_{29} \vee \mathbb{C}_{30} \vee \mathbb{C}_{31} \vee \mathbb{C}_{32} \vee \mathbb{C}_{33} \vee \mathbb{C}_{34} \vee \mathbb{C}_{35})$$

Each of major 39 groups $\mathbb{C}_j$, $1 \leq j \leq 39$, can include several subgroups from 15 subgroups $\mathfrak{g}_k$, $1 \leq k \leq 15$. For their description we introduce the following

Notations for conditions of convergence of generalization of classical Meijer's integral from two G functions

07.34.21.0015.01

$$b^* = s + t - \frac{u+v}{2}$$

07.34.21.0016.01

$$c^* = m + n - \frac{p+q}{2}$$

07.34.21.0017.01

$$\rho = \sum_{j=1}^{v} d_j - \sum_{j=1}^{u} c_j + \frac{u-v}{2} + 1$$

07.34.21.0018.01

$$\mu = \sum_{j=1}^{q} b_j - \sum_{j=1}^{p} a_j + \frac{p-q}{2} + 1$$

07.34.21.0019.01

$$\phi = q - p - r(v-u)$$

07.34.21.0020.01

$$\eta = 1 - \alpha\,(v-u) - \mu - \rho$$

07.34.21.0021.01

$$\psi = \frac{\pi\,(q-m-n) + |\arg(\omega)|}{q-p}$$

07.34.21.0022.01

$$\theta = \frac{\pi\,(v-s-t) + |\arg(\sigma)|}{v-u}$$

07.34.21.0023.01

$$\lambda_c = (q-p)\ |\omega|^{\frac{1}{q-p}} \cos(\psi) + (v-u)\ |\sigma|^{\frac{1}{v-u}} \cos(\theta)$$

07.34.21.0024.01

$$\lambda_s = \lambda_{s0} \ /;\ \arg(\sigma)\arg(\omega) \neq 0$$

07.34.21.0025.01

$$\lambda_s = \left(\lim_{\arg(\sigma)\to 0^+} \lambda_{s0}\right)\left(\lim_{\arg(\sigma)\to 0^-} \lambda_{s0}\right) /;\ \arg(\sigma) = 0 \bigwedge \arg(\omega) \neq 0$$

07.34.21.0026.01

$$\lambda_s = \left(\lim_{\arg(\omega)\to 0^+} \lambda_{s0}\right)\left(\lim_{\arg(\omega)\to 0^-} \lambda_{s0}\right) /;\ \arg(\sigma) \neq 0 \bigwedge \arg(\omega) = 0$$

07.34.21.0027.01

$$\lambda_s = \left(\lim_{\arg(\omega)\to 0^+} \lim_{\arg(\sigma)\to 0^+} \lambda_{s0}\right)\left(\lim_{\arg(\omega)\to 0^+} \lim_{\arg(\sigma)\to 0^-} \lambda_{s0}\right) /;\ \arg(\sigma) = 0 \bigwedge \arg(\omega) = 0$$

07.34.21.0028.01

$$\lambda_{s0} = (q-p)\,|\omega|^{\frac{1}{q-p}} \operatorname{sgn}(\arg(\omega)) \sin(\psi) + (v-u)\,|\sigma|^{\frac{1}{v-u}} \operatorname{sgn}(\arg(\sigma)) \sin(\theta)$$

Fifteen subgroups for major 39 groups

07.34.21.0029.01

$$g_1 = \left(\left(a_i - b_j \notin \mathbb{N}^+ \ /;\ 1 \le i \le n \bigwedge 1 \le j \le m\right) \bigwedge \left(c_g - d_h \notin \mathbb{N}^+ \ /;\ 1 \le g \le t \bigwedge 1 \le h \le s\right)\right)$$

07.34.21.0030.01

$$g_2 = \left(\operatorname{Re}\left(\alpha + r\, b_j + d_h\right) > 0 \ /;\ 1 \le j \le m \bigwedge 1 \le h \le s\right)$$

07.34.21.0031.01

$$g_3 = \left(\operatorname{Re}\left(\alpha + r\, a_i + c_g\right) < r + 1 \ /;\ 1 \le i \le n \bigwedge 1 \le g \le t\right)$$

07.34.21.0032.01

$$g_4 = \left((p-q)\operatorname{Re}\left(\alpha + c_g - 1\right) - r\operatorname{Re}(\mu) > -\frac{3\,r}{2} \ /;\ 1 \le g \le t\right)$$

07.34.21.0033.01

$$g_5 = \left((p-q)\operatorname{Re}(\alpha + d_h) - r\operatorname{Re}(\mu) > -\frac{3\,r}{2} \ /;\ 1 \le h \le s\right)$$

07.34.21.0034.01

$$g_6 = \left((u-v)\operatorname{Re}(\alpha + a_i\, r - r) - \operatorname{Re}(\rho) > -\frac{3}{2} \ /;\ 1 \le i \le n\right)$$

07.34.21.0035.01

$$g_7 = \left((u-v)\operatorname{Re}\left(\alpha + r\, b_j\right) - \operatorname{Re}(\rho) > -\frac{3}{2} \ /;\ 1 \le j \le m\right)$$

07.34.21.0036.01

$$g_8 = (|\phi| + 2\operatorname{Re}((\rho-1)(q-p) + (v-u)\,\alpha\,(q-p) + (\mu-1)\,r\,(v-u)) > 0)$$

07.34.21.0037.01

$$g_9 = (|\phi| - 2\operatorname{Re}((\rho-1)(q-p) + (v-u)\,\alpha\,(q-p) + (\mu-1)\,r\,(v-u)) > 0)$$

07.34.21.0038.01

$$g_{10} = (|\arg(\sigma)| < b^*\,\pi)$$

07.34.21.0039.01

$$\mathfrak{g}_{11} == (|\arg(\sigma)| == b^* \pi)$$

07.34.21.0040.01

$$\mathfrak{g}_{12} == (|\arg(\omega)| < c^* \pi)$$

07.34.21.0041.01

$$\mathfrak{g}_{13} == (|\arg(\omega)| == c^* \pi)$$

07.34.21.0042.01

$$\mathfrak{g}_{14} == \left(\left(\left|\arg\left(1 - \frac{z_0\,\omega^k}{\sigma^l}\right)\right| < \pi \;/;\; z_0 == r^{l\,(v-u)}\,e^{-(l\,b^* + k\,c^*)\,\pi\,i}\right) \bigwedge \phi == 0 \bigwedge (b^* - 1)\,r + c^* \le 0\right)$$

07.34.21.0043.01

$$\mathfrak{g}_{15} == ((\lambda_c > 0) \bigvee (\lambda_c == 0 \bigwedge \lambda_s \neq 0 \bigwedge \mathrm{Re}(\eta) > -1) \bigvee (\lambda_c == \lambda_s == 0 \bigwedge \mathrm{Re}(\eta) > 0))$$

Major 39 groups of conditions of convergence of generalization of classical Meijer's integral from two G functions

07.34.21.0044.01

$$\mathbb{C}_1 == (m\,n\,s\,t \neq 0 \bigwedge b^* > 0 \bigwedge c^* > 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{12})$$

07.34.21.0045.01

$$\mathbb{C}_2 == (u == v \bigwedge b^* == 0 \bigwedge c^* > 0 \bigwedge \sigma > 0 \bigwedge \mathrm{Re}(\rho) < 1 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12})$$

07.34.21.0046.01

$$\mathbb{C}_3 == (p == q \bigwedge b^* > 0 \bigwedge c^* == 0 \bigwedge \omega > 0 \bigwedge \mathrm{Re}(\mu) < 1 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10})$$

07.34.21.0047.01

$$\mathbb{C}_4 == \left(p == q \bigwedge u == v \bigwedge b^* == c^* == 0 \bigwedge \sigma > 0 \bigwedge \omega > 0 \bigwedge \mathrm{Re}(\mu) < 1 \bigwedge \mathrm{Re}(\rho) < 1 \bigwedge \sigma^l \neq \omega^k \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3\right)$$

07.34.21.0048.01

$$\mathbb{C}_5 == \left(p == q \bigwedge u == v \bigwedge b^* == c^* == 0 \bigwedge \sigma > 0 \bigwedge \omega > 0 \bigwedge \mathrm{Re}(\mu + \rho) < 1 \bigwedge \sigma^l \neq \omega^k \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3\right)$$

07.34.21.0049.01

$$\mathbb{C}_6 == (p > q \bigwedge s > 0 \bigwedge b^* > 0 \bigwedge c^* \ge 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_5 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{13})$$

07.34.21.0050.01

$$\mathbb{C}_7 == (p < q \bigwedge t > 0 \bigwedge b^* > 0 \bigwedge c^* \ge 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_4 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{13})$$

07.34.21.0051.01

$$\mathbb{C}_8 == (u > v \bigwedge m > 0 \bigwedge c^* > 0 \bigwedge b^* \ge 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_7 \bigwedge \mathfrak{g}_{11} \bigwedge \mathfrak{g}_{12})$$

07.34.21.0052.01

$$\mathbb{C}_9 == (u < v \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge b^* \ge 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_6 \bigwedge \mathfrak{g}_{11} \bigwedge \mathfrak{g}_{12})$$

07.34.21.0053.01

$$\mathbb{C}_{10} == (p > q \bigwedge u == v \bigwedge b^* == 0 \bigwedge c^* \ge 0 \bigwedge \sigma > 0 \bigwedge \mathrm{Re}(\rho) < 1 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_5 \bigwedge \mathfrak{g}_{13})$$

07.34.21.0054.01

$$\mathbb{C}_{11} == (p < q \bigwedge u == v \bigwedge b^* == 0 \bigwedge c^* \ge 0 \bigwedge \sigma > 0 \bigwedge \mathrm{Re}(\rho) < 1 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_4 \bigwedge \mathfrak{g}_{13})$$

07.34.21.0055.01

$$\mathbb{C}_{12} == (p == q \bigwedge u > v \bigwedge b^* \ge 0 \bigwedge c^* == 0 \bigwedge \omega > 0 \bigwedge \mathrm{Re}(\mu) < 1 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_7 \bigwedge \mathfrak{g}_{11})$$

07.34.21.0056.01

$$\mathbb{C}_{13} == (p == q \bigwedge u < v \bigwedge b^* \ge 0 \bigwedge c^* == 0 \bigwedge \omega > 0 \bigwedge \mathrm{Re}(\mu) < 1 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_6 \bigwedge \mathfrak{g}_{11})$$

07.34.21.0057.01

$$\mathbb{C}_{14} == (p < q \bigwedge u > v \bigwedge b^* \geq 0 \bigwedge c^* \geq 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_4 \bigwedge \mathfrak{g}_7 \bigwedge \mathfrak{g}_{11} \bigwedge \mathfrak{g}_{13})$$

07.34.21.0058.01

$$\mathbb{C}_{15} == (p > q \bigwedge u < v \bigwedge b^* \geq 0 \bigwedge c^* \geq 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_5 \bigwedge \mathfrak{g}_6 \bigwedge \mathfrak{g}_{11} \bigwedge \mathfrak{g}_{13})$$

07.34.21.0059.01

$$\mathbb{C}_{16} == (p > q \bigwedge u > v \bigwedge b^* \geq 0 \bigwedge c^* \geq 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_5 \bigwedge \mathfrak{g}_7 \bigwedge \mathfrak{g}_8 \bigwedge \mathfrak{g}_{11} \bigwedge \mathfrak{g}_{13} \bigwedge \mathfrak{g}_{14})$$

07.34.21.0060.01

$$\mathbb{C}_{17} == (p < q \bigwedge u < v \bigwedge b^* \geq 0 \bigwedge c^* \geq 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_4 \bigwedge \mathfrak{g}_6 \bigwedge \mathfrak{g}_9 \bigwedge \mathfrak{g}_{11} \bigwedge \mathfrak{g}_{13} \bigwedge \mathfrak{g}_{14})$$

07.34.21.0061.01

$$\mathbb{C}_{18} == (t == 0 \bigwedge s > 0 \bigwedge b^* > 0 \bigwedge \phi > 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{10})$$

07.34.21.0062.01

$$\mathbb{C}_{19} == (s == 0 \bigwedge t > 0 \bigwedge b^* > 0 \bigwedge \phi < 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10})$$

07.34.21.0063.01

$$\mathbb{C}_{20} == (n == 0 \bigwedge m > 0 \bigwedge c^* > 0 \bigwedge \phi < 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{12})$$

07.34.21.0064.01

$$\mathbb{C}_{21} == (m == 0 \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge \phi > 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12})$$

07.34.21.0065.01

$$\mathbb{C}_{21} == (m == 0 \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge \phi > 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12})$$

07.34.21.0066.01

$$\mathbb{C}_{22} == (s\, t == 0 \bigwedge b^* > 0 \bigwedge c^* > 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{12})$$

07.34.21.0067.01

$$\mathbb{C}_{23} == (m\, n == 0 \bigwedge b^* > 0 \bigwedge c^* > 0 \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{12})$$

07.34.21.0068.01

$$\mathbb{C}_{24} == (m + n > p \bigwedge t == \phi == 0 \bigwedge s > 0 \bigwedge b^* > 0 \bigwedge c^* < 0 \bigwedge |\arg(\omega)| < (m + n - p + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0069.01

$$\mathbb{C}_{25} == (m + n > q \bigwedge s == \phi == 0 \bigwedge t > 0 \bigwedge b^* > 0 \bigwedge c^* < 0 \bigwedge |\arg(\omega)| < (m + n - q + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0070.01

$$\mathbb{C}_{26} == (p == q - 1 \bigwedge t == \phi == 0 \bigwedge s > 0 \bigwedge b^* > 0 \bigwedge c^* \geq 0 \bigwedge c^*\, \pi < |\arg(\omega)| < (c^* + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0071.01

$$\mathbb{C}_{27} == (p == q + 1 \bigwedge s == \phi == 0 \bigwedge t > 0 \bigwedge b^* > 0 \bigwedge c^* \geq 0 \bigwedge c^*\, \pi < |\arg(\omega)| < (c^* + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0072.01

$$\mathbb{C}_{28} == (p < q - 1 \bigwedge t == \phi == 0 \bigwedge s > 0 \bigwedge b^* > 0 \bigwedge c^* \geq 0 \bigwedge c^*\, \pi < |\arg(\omega)| < (m + n - p + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0073.01

$$\mathbb{C}_{29} == (p > q + 1 \bigwedge s == \phi == 0 \bigwedge t > 0 \bigwedge b^* > 0 \bigwedge c^* \geq 0 \bigwedge c^*\, \pi < |\arg(\omega)| < (m + n - q + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{10} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0074.01

$$\mathbb{C}_{30} == (n == \phi == 0 \bigwedge s + t > u \bigwedge m > 0 \bigwedge c^* > 0 \bigwedge b^* < 0 \bigwedge |\arg(\sigma)| < (s + t - u + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0075.01

$$\mathbb{C}_{31} == (m == \phi == 0 \bigwedge s + t > v \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge b^* < 0 \bigwedge |\arg(\sigma)| < (s + t - v + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0076.01

$$\mathbb{C}_{32} == (n == \phi == 0 \bigwedge u == v - 1 \bigwedge m > 0 \bigwedge c^* > 0 \bigwedge b^* \geq 0 \bigwedge b^*\, \pi < |\arg(\sigma)| < (b^* + 1)\, \pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0077.01

$$\mathbb{C}_{33} == (m == \phi == 0 \bigwedge u == v + 1 \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge b^* \geq 0 \bigwedge b^* \pi < |\arg(\sigma)| < (b^* + 1)\pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0078.01

$$\mathbb{C}_{34} == (n == \phi == 0 \bigwedge u < v - 1 \bigwedge m > 0 \bigwedge c^* > 0 \bigwedge b^* \geq 0 \bigwedge b^* \pi < |\arg(\sigma)| < (s + t - u + 1)\pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_2 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0079.01

$$\mathbb{C}_{35} == (m == \phi == 0 \bigwedge u > v + 1 \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge b^* \geq 0 \bigwedge b^* \pi < |\arg(\sigma)| < (s + t - v + 1)\pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

07.34.21.0080.01

$$\mathbb{C}_{35} == (m == \phi == 0 \bigwedge u > v + 1 \bigwedge n > 0 \bigwedge c^* > 0 \bigwedge b^* \geq 0 \bigwedge b^* \pi < |\arg(\sigma)| < (s + t - v + 1)\pi \bigwedge \mathfrak{g}_1 \bigwedge \mathfrak{g}_3 \bigwedge \mathfrak{g}_{12} \bigwedge \mathfrak{g}_{14} \bigwedge \mathfrak{g}_{15})$$

Integral from three G functions

07.34.21.0081.01

$$\int_0^\infty t^{\alpha-1} G_{p,q}^{m,n}\left(z\,t \,\middle|\, \begin{matrix} a_1, & \ldots, & a_p \\ b_1, & \ldots, & b_q \end{matrix}\right) G_{p_1,q_1}^{m_1,n_1}\left(x\,t \,\middle|\, \begin{matrix} a_{11}, & \ldots, & a_{1\,p_1} \\ b_{11}, & \ldots, & b_{1\,q_1} \end{matrix}\right) G_{p_2,q_2}^{m_2,n_2}\left(y\,t \,\middle|\, \begin{matrix} a_{21}, & \ldots, & a_{2\,p_2} \\ b_{21}, & \ldots, & b_{2\,q_2} \end{matrix}\right) dt ==$$

$$z^{-\alpha}\, G_{q,p:p_1,q_1:p_2,q_2}^{n,m:m_1,n_1:m_2,n_2}\left(\begin{matrix} 1-\alpha-b_1, & \ldots, & 1-\alpha-b_q \\ 1-\alpha-a_1, & \ldots, & 1-\alpha-a_p \end{matrix} \,\middle|\, \begin{matrix} a_{11}, & \ldots, & a_{1\,p_1} \\ b_{11}, & \ldots, & b_{1\,q_1} \end{matrix} \,\middle|\, \begin{matrix} a_{21}, & \ldots, & a_{2\,p_2} \\ b_{21}, & \ldots, & b_{2\,q_2} \end{matrix} \,\middle|\, \frac{x}{z}, \frac{y}{z}\right)$$

Remark: This relationship only holds true when the parameters satisfy certain well-specified restrictions.

Integral including G functions with shifted arguments

07.34.21.0082.01

$$\int_0^\infty \tau^{\alpha-1} G_{u,v}^{s,t}\left(\sigma+\tau \,\middle|\, \begin{matrix} c_1, \ldots, c_t, c_{t+1}, \ldots, c_u \\ d_1, \ldots, d_s, d_{s+1}, \ldots, d_v \end{matrix}\right) G_{p,q}^{m,n}\left(\omega\,\tau \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau == \sum_{k=0}^{\infty} \frac{(-\sigma)^k}{k!} G_{p+v+1,q+u+1}^{m+t,n+s+1}$$

$$\left(\omega \,\middle|\, \begin{matrix} 1-\alpha, a_1, \ldots, a_n, k-\alpha-d_1+1, \ldots, k-\alpha-d_s+1, k-\alpha-d_{s+1}+1, \ldots, k-\alpha-d_v+1, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, k-\alpha-c_1+1, \ldots, k-\alpha-c_t+1, k-\alpha-c_{t+1}+1, \ldots, k-\alpha-c_u+1, k-\alpha+1, b_{m+1}, \ldots, b_q \end{matrix}\right) /;$$

$$b^* > 0 \bigwedge c^* > 0 \bigwedge |\arg(\sigma)| < \pi \bigwedge |\arg(\omega)| < c^* \pi \bigwedge -\min(\mathrm{Re}(b_1), \ldots, \mathrm{Re}(b_m)) < \mathrm{Re}(\alpha) < 2 - \max(\mathrm{Re}(a_1), \ldots, \mathrm{Re}(a_n)) - \max(\mathrm{Re}(c_1), \ldots, \mathrm{Re}(c_t))$$

Integral by variable in parameters

07.34.21.0083.01

$$\int_{-\infty}^\infty G_{p,q}^{m,n}\left(\omega\,\tau \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{p-2}, \tau+a_{p-1}, \tau+a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{q-2}, \tau+b_{q-1}, \tau+b_q \end{matrix}\right) d\tau ==$$

$$\frac{\Gamma(a_{p-1}+a_p-b_{q-1}-b_q-1)}{\Gamma(a_{p-1}-b_{q-1})\,\Gamma(a_{p-1}-b_q)\,\Gamma(a_p-b_{q-1})\,\Gamma(a_p-b_q)} G_{p-2,q-2}^{m,n}\left(\omega \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_{p-2} \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_{q-2} \end{matrix}\right) /;$$

$$c^* > 0 \bigwedge |\arg(\omega)| < c^* \pi \bigwedge \mathrm{Re}\left(\sum_{j=1}^p a_j - \sum_{j=1}^q b_j\right) > 1$$

Integrals for classical integral transforms

07.34.21.0084.01

$$\int_0^a \tau^{\alpha-1}(a-\tau)^{\beta-1} G_{p,q}^{m,n}\left(\omega\,\tau^{l/k} \middle| \begin{matrix} a_1,\ldots,a_n,a_{n+1},\ldots,a_p \\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right) d\tau = \frac{k^\mu\, l^{-\beta}\,\Gamma(\beta)}{(2\pi)^{c^*(k-1)}\, a^{1-\alpha-\beta}}$$

$$G_{k\,p+l,k\,q+l}^{k\,m,k\,n+l}\left(\frac{\omega^k a^l}{k^{k(q-p)}} \middle| \begin{matrix} \frac{1-\alpha}{l},\ldots,\frac{l-\alpha}{l},\frac{a_1}{k},\ldots,\frac{a_1+k-1}{k},\ldots,\frac{a_n}{k},\ldots,\frac{a_n+k-1}{k},\frac{a_{n+1}}{k},\ldots,\frac{a_{n+1}+k-1}{k},\ldots,\frac{a_p}{k},\ldots,\frac{a_p+k-1}{k} \\ \frac{b_1}{k},\ldots,\frac{b_1+k-1}{k},\ldots,\frac{b_m}{k},\ldots,\frac{b_m+k-1}{k},\frac{b_{m+1}}{k},\ldots,\frac{b_{m+1}+k-1}{k},\ldots,\frac{b_q}{k},\ldots,\frac{b_q+k-1}{k},\frac{1-\alpha-\beta}{l},\ldots,\frac{l-\alpha-\beta}{l}\end{matrix}\right) /;$$

$$k\in\mathbb{N}^+ \bigwedge l\in\mathbb{N}^+ \bigwedge \gcd(k,l)=1 \bigwedge \left(\mathbb{CC}\ /;\ \sigma=\frac{1}{a} \bigwedge s=u=v=1 \bigwedge t=d_1=0 \bigwedge c_1=\beta\right)$$

07.34.21.0085.01

$$\int_a^\infty \tau^{\alpha-1}(\tau-a)^{\beta-1} G_{p,q}^{m,n}\left(\omega\,\tau^{l/k} \middle| \begin{matrix} a_1,\ldots,a_n,a_{n+1},\ldots,a_p \\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right) d\tau = \frac{k^\mu\, l^{-\beta}\,\Gamma(\beta)}{(2\pi)^{c^*(k-1)}\, a^{1-\alpha-\beta}}$$

$$G_{k\,p+l,k\,q+l}^{k\,m+l,k\,n}\left(\frac{\omega^k a^l}{k^{k(q-p)}} \middle| \begin{matrix} \frac{a_1}{k},\ldots,\frac{a_1+k-1}{k},\ldots,\frac{a_n}{k},\ldots,\frac{a_n+k-1}{k},\frac{a_{n+1}}{k},\ldots,\frac{a_{n+1}+k-1}{k},\ldots,\frac{a_p}{k},\ldots,\frac{a_p+k-1}{k},\frac{1-\alpha}{l},\ldots,\frac{l-\alpha}{l} \\ \frac{1-\alpha-\beta}{l},\ldots,\frac{l-\alpha-\beta}{l},\frac{b_1}{k},\ldots,\frac{b_1+k-1}{k},\ldots,\frac{b_m}{k},\ldots,\frac{b_m+k-1}{k},\frac{b_{m+1}}{k},\ldots,\frac{b_{m+1}+k-1}{k},\ldots,\frac{b_q}{k},\ldots,\frac{b_q+k-1}{k}\end{matrix}\right) /;$$

$$k\in\mathbb{N}^+ \bigwedge l\in\mathbb{N}^+ \bigwedge \gcd(k,l)=1 \bigwedge \left(\mathbb{CC}\ /;\ \sigma=\frac{1}{a} \bigwedge t=u=v=1 \bigwedge s=d_1=0 \bigwedge c_1=\beta\right)$$

07.34.21.0086.01

$$\int_0^\infty \frac{\tau^{\alpha-1}}{(z+\tau)^\lambda} G_{p,q}^{m,n}\left(\omega\,\tau^{l/k} \middle| \begin{matrix} a_1,\ldots,a_n,a_{n+1},\ldots,a_p \\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right) d\tau = \frac{k^\mu\, l^{\lambda-1}\, z^{\alpha-\lambda}}{(2\pi)^{(k-1)c^*+l-1}\,\Gamma(\lambda)}$$

$$G_{k\,p+l,k\,q+l}^{k\,m+l,k\,n+l}\left(\frac{\omega^k z^l}{k^{k(q-p)}} \middle| \begin{matrix} \frac{1-\alpha}{l},\ldots,\frac{l-\alpha}{l},\frac{a_1}{k},\ldots,\frac{a_1+k-1}{k},\ldots,\frac{a_n}{k},\ldots,\frac{a_n+k-1}{k},\frac{a_{n+1}}{k},\ldots,\frac{a_{n+1}+k-1}{k},\ldots,\frac{a_p}{k},\ldots,\frac{a_p+k-1}{k} \\ \frac{\lambda-\alpha}{l},\ldots,\frac{\lambda-\alpha+l-1}{l},\frac{b_1}{k},\ldots,\frac{b_1+k-1}{k},\ldots,\frac{b_m}{k},\ldots,\frac{b_m+k-1}{k},\frac{b_{m+1}}{k},\ldots,\frac{b_{m+1}+k-1}{k},\ldots,\frac{b_q}{k},\ldots,\frac{b_q+k-1}{k}\end{matrix}\right) /;$$

$$k\in\mathbb{N}^+ \bigwedge l\in\mathbb{N}^+ \bigwedge \gcd(k,l)=1 \bigwedge \left(\mathbb{CC}\ /;\ \sigma=\frac{1}{z} \bigwedge s=t=u=v=1 \bigwedge c_1=1-\lambda \bigwedge d_1=0\right)$$

07.34.21.0087.01

$$\mathcal{P}\int_0^\infty \frac{\tau^{\alpha-1}}{\tau-y} G_{p,q}^{m,n}\left(\omega\,\tau^{l/k} \middle| \begin{matrix} a_1,\ldots,a_n,a_{n+1},\ldots,a_p \\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right) d\tau = -\frac{\pi\, k^\mu\, y^{\alpha-1}}{(2\pi)^{c^*(k-1)}} G_{20,20}^{10,10}$$

$$\left(\frac{\omega^k y^l}{k^{k(q-p)}} \middle| \begin{matrix} \frac{1-\alpha}{l},\ldots,\frac{l-\alpha}{l},\frac{a_1}{k},\ldots,\frac{a_1+k-1}{k},\ldots,\frac{a_n}{k},\ldots,\frac{a_n+k-1}{k},\frac{a_{n+1}}{k},\ldots,\frac{a_{n+1}+k-1}{k},\ldots,\frac{a_p}{k},\ldots,\frac{a_p+k-1}{k},\frac{\frac{1}{2}-\alpha}{l},\ldots,\frac{l-\alpha-\frac{1}{2}}{l} \\ \frac{1-\alpha}{l},\ldots,\frac{l-\alpha}{l},\frac{b_1}{k},\ldots,\frac{b_1+k-1}{k},\ldots,\frac{b_m}{k},\ldots,\frac{b_m+k-1}{k},\frac{b_{m+1}}{k},\ldots,\frac{b_{m+1}+k-1}{k},\ldots,\frac{b_q}{k},\ldots,\frac{b_q+k-1}{k},\frac{\frac{1}{2}-\alpha}{l},\ldots,\frac{l-\alpha-\frac{1}{2}}{l}\end{matrix}\right) /;$$

$$k\in\mathbb{N}^+ \bigwedge l\in\mathbb{N}^+ \bigwedge \gcd(k,l)=1 \bigwedge y>0 \bigwedge \left(\mathbb{CC}\ /;\ \sigma=\frac{1}{y} \bigwedge s=t=1 \bigwedge u=v=2 \bigwedge c_1=d_1=0 \bigwedge c_2=d_2=\frac{1}{2}\right)$$

07.34.21.0088.01

$$\int_0^\infty \tau^{\alpha-1} e^{-\sigma\tau} G_{p,q}^{m,n}\left(\omega\,\tau^{l/k} \middle| \begin{matrix} a_1,\ldots,a_n,a_{n+1},\ldots,a_p \\ b_1,\ldots,b_m,b_{m+1},\ldots,b_q\end{matrix}\right) d\tau = \frac{k^\mu\, l^{\alpha-\frac{1}{2}}\,\sigma^{-\alpha}}{(2\pi)^{\frac{l-1}{2}+(k-1)c^*}}$$

$$G_{k\,p+l,k\,q}^{k\,m,k\,n+l}\left(\frac{\omega^k l^l}{\sigma^l k^{k(q-p)}} \middle| \begin{matrix} \frac{1-\alpha}{l},\ldots,\frac{l-\alpha}{l},\frac{a_1}{k},\ldots,\frac{k+a_1-1}{k},\ldots,\frac{a_n}{k},\ldots,\frac{k+a_n-1}{k},\frac{a_{n+1}}{k},\ldots,\frac{k+a_{n+1}-1}{k},\ldots,\frac{a_p}{k},\ldots,\frac{k+a_p-1}{k} \\ \frac{b_1}{k},\ldots,\frac{k+b_1-1}{k},\ldots,\frac{b_m}{k},\ldots,\frac{k+b_m-1}{k},\frac{b_{m+1}}{k},\ldots,\frac{k+b_{m+1}-1}{k},\ldots,\frac{b_q}{k},\ldots,\frac{k+b_q-1}{k}\end{matrix}\right) /;$$

$$k\in\mathbb{N}^+ \land l\in\mathbb{N}^+ \land \gcd(k,l)=1 \land (\mathbb{CC}\ /;\ s=v=1 \land t=u=d_1=0)$$

07.34.21.0089.01

$$\int_0^\infty \tau^{\alpha-1} \sin(b\,\tau)\, G_{p,q}^{m,n}\!\left(\omega\,\tau^{\frac{2l}{k}} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau = \frac{k^\mu\,(2\,l)^{\alpha-\frac{1}{2}}\, b^{-\alpha}}{2\,(2\,\pi)^{c^*\,(k-1)-\frac{1}{2}}}\, G_{k\,p+2\,l,k\,q}^{k\,m,k\,n+l}\!\left(\frac{\omega^k\,(2\,l)^{2\,l}}{b^{2\,l}\,k^{k\,(q-p)}} \,\middle|\, \begin{matrix} \frac{(1-\alpha)/2}{l}, \ldots, \frac{l+(-1-\alpha)/2}{l}, \frac{a_1}{k}, \ldots, \frac{a_1+k-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{a_n+k-1}{k}, \frac{a_{n+1}}{k}, \ldots, \frac{a_{n+1}+k-1}{k}, \ldots, \frac{a_p}{k}, \ldots, \frac{a_p+k-1}{k}, \frac{1-\alpha/2}{l}, \ldots, \frac{l-\alpha/2}{l} \\ \frac{b_1}{k}, \ldots, \frac{b_1+k-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{b_m+k-1}{k}, \frac{b_{m+1}}{k}, \ldots, \frac{b_{m+1}+k-1}{k}, \ldots, \frac{b_q}{k}, \ldots, \frac{b_q+k-1}{k} \end{matrix}\right) /;$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{b^2}{4} \bigwedge s = 1 \bigwedge t = u = d_2 = 0 \bigwedge v = 2 \bigwedge d_1 = \frac{1}{2}\right)$$

07.34.21.0090.01

$$\int_0^\infty \tau^{\alpha-1} \cos(b\,\tau)\, G_{p,q}^{m,n}\!\left(\omega\,\tau^{\frac{2l}{k}} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau = \frac{k^\mu\,(2\,l)^{\alpha-\frac{1}{2}}\, b^{-\alpha}}{2\,(2\,\pi)^{c^*\,(k-1)-\frac{1}{2}}}\, G_{k\,p+2\,l,k\,q}^{k\,m,k\,n+l}\!\left(\frac{\omega^k\,(2\,l)^{2\,l}}{b^{2\,l}\,k^{k\,(q-p)}} \,\middle|\, \begin{matrix} \frac{1-\alpha/2}{l}, \ldots, \frac{l-\alpha/2}{l}, \frac{a_1}{k}, \ldots, \frac{a_1+k-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{a_n+k-1}{k}, \frac{a_{n+1}}{k}, \ldots, \frac{a_{n+1}+k-1}{k}, \ldots, \frac{a_p}{k}, \ldots, \frac{a_p+k-1}{k}, \frac{(1-\alpha)/2}{l}, \ldots, \frac{(-1-\alpha)/2+l}{l} \\ \frac{b_1}{k}, \ldots, \frac{b_1+k-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{b_m+k-1}{k}, \frac{b_{m+1}}{k}, \ldots, \frac{b_{m+1}+k-1}{k}, \ldots, \frac{b_q}{k}, \ldots, \frac{b_q+k-1}{k} \end{matrix}\right) /;$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{b^2}{4} \bigwedge s = 1 \bigwedge t = u = d_1 = 0 \bigwedge v = 2 \bigwedge d_2 = \frac{1}{2}\right)$$

07.34.21.0091.01

$$\int_0^\infty \tau^{\alpha-1} J_\nu(b\,\tau)\, G_{p,q}^{m,n}\!\left(\omega\,\tau^{\frac{2l}{k}} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau = \frac{k^\mu\,(2\,l)^{\alpha-1}\, b^{-\alpha}}{(2\,\pi)^{c^*\,(k-1)}}\, G_{k\,p+2\,l,k\,q}^{k\,m,k\,n+l}\!\left(\frac{\omega^k\,(2\,l)^{2\,l}}{b^{2\,l}\,k^{k\,(q-p)}} \,\middle|\, \begin{matrix} \frac{1-(\alpha+\nu)/2}{l}, \ldots, \frac{l-(\alpha+\nu)/2}{l}, \frac{a_1}{k}, \ldots, \\ \frac{b_1}{k}, \ldots, \end{matrix}\right.$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{b^2}{4} \bigwedge s = 1 \bigwedge t = u = 0 \bigwedge v = 2 \bigwedge d_1 = -d_2 = \frac{\nu}{2}\right)$$

07.34.21.0092.01

$$\int_0^\infty \tau^{\alpha-1} Y_\nu(b\,\tau)\, G_{p,q}^{m,n}\!\left(\omega\,\tau^{\frac{2l}{k}} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau = \frac{k^\mu\,(2\,l)^{\alpha-1}\, b^{-\alpha}}{(2\,\pi)^{c^*\,(k-1)}}\, G_{k\,p+3\,l,k\,q+l}^{k\,m,k\,n+2\,l}\!\left(\frac{\omega^k\,(2\,l)^{2\,l}}{b^{2\,l}\,k^{k\,(q-p)}} \,\middle|\, \begin{matrix} \frac{1-\frac{\alpha+\nu}{2}}{l}, \ldots, \frac{l-\frac{\alpha+\nu}{2}}{l}, \frac{1-\frac{\alpha-\nu}{2}}{l}, \ldots, \\ \frac{b_1}{k}, \ldots, \frac{b_1+k}{k} \end{matrix}\right.$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge$$

$$\left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{b^2}{4} \bigwedge s = 2 \bigwedge t = 0 \bigwedge u = 1 \bigwedge v = 3 \bigwedge c_1 = d_3 = \frac{1-\nu}{2} \bigwedge d_1 = -\frac{\nu}{2} \bigwedge d_2 = \frac{\nu}{2}\right)$$

07.34.21.0093.01

$$\int_0^\infty \tau^{\alpha-1} K_\nu(b\,\tau)\, G_{p,q}^{m,n}\!\left(\omega\,\tau^{\frac{2l}{k}} \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) d\tau = \frac{\pi\,k^\mu\,(2\,l)^{\alpha-1}\, b^{-\alpha}}{(2\,\pi)^{l+(k-1)\,c^*}}\, G_{k\,p+2\,l,k\,q}^{k\,m,k\,n+2\,l}\!\left(\frac{\omega^k\,(2\,l)^{2\,l}}{b^{2\,l}\,k^{k\,(q-p)}} \,\middle|\, \begin{matrix} \frac{1-\frac{\alpha+\nu}{2}}{l}, \ldots, \frac{l-\frac{\alpha+\nu}{2}}{l}, \frac{1-\frac{\alpha-\nu}{2}}{l}, \ldots, \frac{l-\frac{\alpha-\nu}{2}}{l}, \frac{a_1}{k}, \ldots, \frac{a_1+k-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{a_n+k-1}{k}, \frac{a_{n+1}}{k}, \ldots, \frac{a_{n+1}+k-1}{k}, \ldots, \frac{a_p}{k}, \ldots, \frac{a_p+k-1}{k} \\ \frac{b_1}{k}, \ldots, \frac{b_1+k-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{b_m+k-1}{k}, \frac{b_{m+1}}{k}, \ldots, \frac{b_{m+1}+k-1}{k}, \ldots, \frac{b_q}{k}, \ldots, \frac{b_q+k-1}{k} \end{matrix}\right) /;$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{b^2}{4} \bigwedge s = v = 2 \bigwedge t = u = 0 \bigwedge d_1 = -\frac{\nu}{2} \bigwedge d_2 = \frac{\nu}{2}\right)$$

07.34.21.0094.01

$$\mathcal{P}\int_{-\infty}^{\infty}\frac{1}{\tau-y}\,G_{p,q}^{m,n}\!\left(\omega\,\tau\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)d\tau = -\pi\,G_{p+2,q+2}^{m+1,n+1}\!\left(\omega\,y\,\middle|\,\begin{matrix}0,\,a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,-\frac{1}{2}\\ 0,\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q,\,-\frac{1}{2}\end{matrix}\right)-G_{p+1,q+1}^{m+1,n+1}\!\left(-\omega\,y\,\middle|\,\begin{matrix}0,\,a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ 0,\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\text{/; }$$

$$y\in\mathbb{R}\bigwedge\left(\mathbb{CC}\text{ /; }\sigma=\frac{1}{y}\bigwedge\alpha=k=l=s=t=1\bigwedge u=v=2\bigwedge c_1=d_1=0\bigwedge c_2=d_2=\frac{1}{2}\right)\bigwedge\left(\mathbb{CC}\text{ /; }\alpha=1\bigwedge\sigma=\frac{1}{y}\bigwedge\omega\to-\omega\wedge\alpha=k=l=s=t=u=v=1\wedge c_1=d_1=0\right)$$

Integrals including G functions with rational arguments

07.34.21.0095.01

$$\int_0^{\infty}\frac{\tau^{\alpha-1}}{(z+\tau)^{\beta}}\,G_{p,q}^{m,n}\!\left(\frac{\omega\,(z+\tau)^l}{\tau^k}\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)d\tau = \frac{\sqrt{2\pi}\,k^{\alpha-\frac{1}{2}}\,l^{\frac{1}{2}-\beta}\,z^{\alpha-\beta}}{(l-k)^{\alpha-\beta+\frac{1}{2}}}\,G_{p+l,q+l}^{m+l,n}\!\left(\frac{\omega\,l^l}{k^k}\left(\frac{z}{l-k}\right)^{l-k}\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,\frac{\beta}{l},\,\ldots,\,\frac{\beta+l-1}{l}\\ \frac{\alpha}{k},\,\ldots,\,\frac{\alpha+k-1}{k},\,\frac{\beta-\alpha}{l-k},\,\ldots,\,\frac{\beta-\alpha+l-k-1}{l-k},\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\text{/; }$$

$$k\in\mathbb{N}^+\bigwedge l\in\mathbb{N}^+\bigwedge k<l\bigwedge c^*>0\bigwedge\left|\arg\left(\omega\,z^{l-k}\right)\right|<\pi\,c^*\bigwedge (l-k)\,(1-\max(\mathrm{Re}(a_1),\,\ldots,\,\mathrm{Re}(a_n)))+\mathrm{Re}(\beta-\alpha)>0\bigwedge k-k\max(\mathrm{Re}(a_1),\,\ldots,\,\mathrm{Re}(a_n))+\mathrm{Re}(\alpha)>0$$

07.34.21.0096.01

$$\int_0^{\infty}\frac{\tau^{\alpha-1}}{(z+\tau)^{\beta}}\,G_{p,q}^{m,n}\!\left(\frac{\omega\,(z+\tau)^l}{\tau^k}\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)d\tau = \frac{\sqrt{2\pi}\,k^{\alpha-\frac{1}{2}}\,l^{\frac{1}{2}-\beta}\,z^{\alpha-\beta}}{(k-l)^{\alpha-\beta+\frac{1}{2}}}\,G_{p+k,q+k}^{m+k,n+k-l}\!\left(\frac{\omega\,l^l}{k^k}\left(\frac{z}{k-l}\right)^{l-k}\,\middle|\,\begin{matrix}\frac{\alpha-\beta+1}{k-l},\,\ldots,\,\frac{\alpha-\beta+k-l}{k-l},\,a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,\frac{\beta}{l},\,\ldots,\,\frac{\beta+l-1}{l}\\ \frac{\alpha}{k},\,\ldots,\,\frac{\alpha+k-1}{k},\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\text{/; }$$

$$k\in\mathbb{N}^+\bigwedge l\in\mathbb{N}^+\bigwedge k>l\bigwedge c^*>0\bigwedge\left|\arg\left(\omega\,z^{l-k}\right)\right|<\pi\,c^*\bigwedge (k-l)\min(\mathrm{Re}(b_1),\,\ldots,\,\mathrm{Re}(b_m))+\mathrm{Re}(\beta-\alpha)>0\bigwedge k-k\max(\mathrm{Re}(a_1),\,\ldots,\,\mathrm{Re}(a_n))+\mathrm{Re}(\alpha)>0$$

07.34.21.0097.01

$$\int_0^{\infty}\frac{\tau^{\alpha-1}}{(z+\tau)^{\beta}}\,G_{p,q}^{m,n}\!\left(\frac{\omega\,(z+\tau)^k}{\tau^k}\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)d\tau = \sqrt{2\pi}\,k^{\alpha-\beta}\,z^{\alpha-\beta}\,\Gamma(\beta-\alpha)\,G_{p+k,q+k}^{m+k,n}\!\left(\omega\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p,\,\frac{\beta}{k},\,\ldots,\,\frac{\beta+k-1}{k}\\ \frac{\alpha}{k},\,\ldots,\,\frac{\alpha+k-1}{k},\,b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)\text{/; }$$

$$k\in\mathbb{N}^+\wedge c^*>0\wedge|\arg(\omega)|<\pi\,c^*\wedge\mathrm{Re}(\beta-\alpha)>0\wedge k-k\max(\mathrm{Re}(a_1),\,\ldots,\,\mathrm{Re}(a_n))+\mathrm{Re}(\alpha)>0$$

Integral transforms

Fourier cos transforms

07.34.22.0001.01

$$\mathcal{F}c_t\left[t^{\alpha-1} G_{p,q}^{m,n}\left(\omega\, t^{\frac{2l}{k}} \middle| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right)\right](z) = \frac{k^\mu (2l)^{\alpha-\frac{1}{2}} z^{-\alpha}}{(2\pi)^{c^*(k-1)}} G_{k\,p+2\,l,k\,q}^{k\,m,k\,n+l}\left(\frac{\omega^k (2l)^{2l}}{z^{2l} k^{k(q-p)}} \middle| \begin{array}{c} \frac{1-\alpha/2}{l}, \ldots, \frac{l-\alpha/2}{l}, \frac{a_1}{k}, \ldots, \frac{a_1+k-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{a_n+k-1}{k}, \frac{a_{n+1}}{k}, \ldots, \frac{a_{n+1}+k-1}{k}, \ldots, \frac{a_p}{k}, \ldots, \frac{a_p+k-1}{k}, \frac{(1-\alpha)/2}{l}, \ldots, \frac{(-1-\alpha)/2+l}{l} \\ \frac{b_1}{k}, \ldots, \frac{b_1+k-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{b_m+k-1}{k}, \frac{b_{m+1}}{k}, \ldots, \frac{b_{m+1}+k-1}{k}, \ldots, \frac{b_q}{k}, \ldots, \frac{b_q+k-1}{k} \end{array}\right) /;$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{z^2}{4} \bigwedge s = 1 \bigwedge t = u = d_1 = 0 \bigwedge v = 2 \bigwedge d_2 = \frac{1}{2}\right)$$

Fourier sin transforms

07.34.22.0002.01

$$\mathcal{F}s_t\left[t^{\alpha-1} G_{p,q}^{m,n}\left(\omega\, t^{\frac{2l}{k}} \middle| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right)\right](z) = \frac{k^\mu (2l)^{\alpha-\frac{1}{2}} z^{-\alpha}}{(2\pi)^{c^*(k-1)}} G_{k\,p+2\,l,k\,q}^{k\,m,k\,n+l}\left(\frac{\omega^k (2l)^{2l}}{z^{2l} k^{k(q-p)}} \middle| \begin{array}{c} \frac{(1-\alpha)/2}{l}, \ldots, \frac{l+(-1-\alpha)/2}{l}, \frac{a_1}{k}, \ldots, \frac{a_1+k-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{a_n+k-1}{k}, \frac{a_{n+1}}{k}, \ldots, \frac{a_{n+1}+k-1}{k}, \ldots, \frac{a_p}{k}, \ldots, \frac{a_p+k-1}{k}, \frac{1-\alpha/2}{l}, \ldots, \frac{l-\alpha/2}{l} \\ \frac{b_1}{k}, \ldots, \frac{b_1+k-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{b_m+k-1}{k}, \frac{b_{m+1}}{k}, \ldots, \frac{b_{m+1}+k-1}{k}, \ldots, \frac{b_q}{k}, \ldots, \frac{b_q+k-1}{k} \end{array}\right) /;$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{\alpha}{2} \bigwedge \sigma = \frac{z^2}{4} \bigwedge s = 1 \bigwedge t = u = d_2 = 0 \bigwedge v = 2 \bigwedge d_1 = \frac{1}{2}\right)$$

Laplace transforms

07.34.22.0003.01

$$\mathcal{L}_t\left[t^{\alpha-1} G_{p,q}^{m,n}\left(\omega\, t^{l/k} \middle| \begin{array}{c} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right)\right](z) = \frac{k^\mu l^{\alpha-\frac{1}{2}} z^{-\alpha}}{(2\pi)^{\frac{l-1}{2}+(k-1)c^*}}$$

$$G_{k\,p+l,k\,q}^{k\,m,k\,n+l}\left(\frac{\omega^k l^l}{z^l k^{k(q-p)}} \middle| \begin{array}{c} \frac{1-\alpha}{l}, \ldots, \frac{l-\alpha}{l}, \frac{a_1}{k}, \ldots, \frac{k+a_1-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{k+a_n-1}{k}, \frac{a_{n+1}}{k}, \ldots, \frac{k+a_{n+1}-1}{k}, \ldots, \frac{a_p}{k}, \ldots, \frac{k+a_p-1}{k} \\ \frac{b_1}{k}, \ldots, \frac{k+b_1-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{k+b_m-1}{k}, \frac{b_{m+1}}{k}, \ldots, \frac{k+b_{m+1}-1}{k}, \ldots, \frac{b_q}{k}, \ldots, \frac{k+b_q-1}{k} \end{array}\right) /;$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge (\mathbb{CC} /; \sigma = z \bigwedge s = v = 1 \bigwedge t = u = d_1 = 0)$$

Mellin transforms

07.34.22.0004.01

$$\mathcal{M}_t\left[G_{p,q}^{m,n}\left(\omega t \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right.\right)\right](z) = \omega^{-z} \frac{\prod_{k=1}^m \Gamma(b_k + z) \prod_{k=1}^n \Gamma(1 - a_k - z)}{\prod_{k=n+1}^p \Gamma(a_k + z) \prod_{k=m+1}^q \Gamma(1 - b_k - z)} /;$$

$$m^2 + n^2 > 0 \bigwedge \omega \neq 0 \bigwedge \Bigg((c^* > 0 \wedge |\arg(\omega)| < c^* \pi \wedge -\min(\operatorname{Re}(b_1), \ldots, \operatorname{Re}(b_m)) < \operatorname{Re}(z) < 1 - \max(\operatorname{Re}(a_1), \ldots, \operatorname{Re}(a_n))) \bigvee$$

$$\Bigg(p \neq q \bigwedge c^* \geq 0 \bigwedge |\arg(\omega)| = c^* \pi \bigwedge -\min(\operatorname{Re}(b_1), \ldots, \operatorname{Re}(b_m)) < \operatorname{Re}(z) < 1 - \max(\operatorname{Re}(a_1), \ldots, \operatorname{Re}(a_n)) \bigwedge$$

$$\operatorname{Re}((q - p) z + \mu) < \frac{3}{2} \bigwedge \mu = \sum_{j=1}^q b_j - \sum_{j=1}^p a_j + \frac{p - q}{2} + 1\Bigg) \bigvee \Bigg(p = q \bigwedge c^* = 0 \bigwedge \omega > 0 \bigwedge$$

$$-\min(\operatorname{Re}(b_1), \ldots, \operatorname{Re}(b_m)) < \operatorname{Re}(z) < 1 - \max(\operatorname{Re}(a_1), \ldots, \operatorname{Re}(a_n)) \bigwedge \operatorname{Re}\left(\sum_{j=1}^q \left(b_j - a_j\right)\right) < 0\Bigg)\Bigg)$$

07.34.22.0005.01

$$\mathcal{M}_t\left[G_{0,0}^{0,0}\left(t x \left| \right.\right)\right](z) = x^{-z} /; x > 0$$

07.34.22.0006.01

$$\mathcal{M}_\tau\left[G_{u,v}^{s,t}\left(\sigma \tau \left| \begin{array}{l} c_1, \ldots, c_t, c_{t+1}, \ldots, c_u \\ d_1, \ldots, d_s, d_{s+1}, \ldots, d_v \end{array}\right.\right) G_{p,q}^{m,n}\left(\omega \tau^{l/k} \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right.\right)\right](z) = \frac{k^\mu l^{(v-u) z + \rho - 1}}{(2 \pi)^{(l-1) b^* + (k-1) c^*}} \sigma^{-z}$$

$$G_{k p+l v, k q+l u}^{k m+l t, k n+l s}\left(\frac{\omega^k k^{k (p-q)}}{\sigma^l l^{l (u-v)}} \left| \begin{array}{l} \frac{a_1}{k}, \ldots, \frac{a_1+k-1}{k}, \ldots, \frac{a_n}{k}, \ldots, \frac{a_n+k-1}{k}, \frac{1-z-d_1}{l}, \ldots, \frac{l-z-d_1}{l}, \ldots, \frac{1-z-d_s}{l}, \ldots, \frac{l-z-d_s}{l}, \frac{1-z-d_{s+1}}{l}, \ldots, \frac{l-z-d_{s+1}}{l}, \ldots, \frac{1-}{} \\ \frac{b_1}{k}, \ldots, \frac{b_1+k-1}{k}, \ldots, \frac{b_m}{k}, \ldots, \frac{b_m+k-1}{k}, \frac{1-z-c_1}{l}, \ldots, \frac{l-z-c_1}{l}, \ldots, \frac{1-z-c_t}{l}, \ldots, \frac{l-z-c_t}{l}, \frac{1-z-c_{t+1}}{l}, \ldots, \frac{l-z-c_{t+1}}{l}, \ldots, \frac{1-}{} \end{array}\right.\right.$$

$$k \in \mathbb{N}^+ \wedge l \in \mathbb{N}^+ \wedge \gcd(k, l) = 1 \wedge (\mathbb{CC} /; \alpha \to z)$$

07.34.22.0007.01

$$\mathcal{M}_t\left[G_{p,q}^{m,n}\left(\omega t \left| \begin{array}{lll} a_1, & \ldots, & a_p \\ b_1, & \ldots, & b_q \end{array}\right.\right) G_{p_1,q_1}^{m_1,n_1}\left(x t \left| \begin{array}{lll} a_{11}, & \ldots, & a_{1 p_1} \\ b_{11}, & \ldots, & b_{1 q_1} \end{array}\right.\right) G_{p_2,q_2}^{m_2,n_2}\left(y t \left| \begin{array}{lll} a_{21}, & \ldots, & a_{2 p_2} \\ b_{21}, & \ldots, & b_{2 q_2} \end{array}\right.\right)\right](z) =$$

$$\omega^{-z} G_{q,p:p_1,q_1:p_2,q_2}^{n,m:m_1,n_1:m_2,n_2}\left(\begin{array}{lll} 1 - z - b_1, & \ldots, & 1 - z - b_q \\ 1 - z - a_1, & \ldots, & 1 - z - a_p \end{array} \left| \begin{array}{lll} a_{11}, & \ldots, & a_{1 p_1} \\ b_{11}, & \ldots, & b_{1 q_1} \end{array} \right| \begin{array}{lll} a_{21}, & \ldots, & a_{2 p_2} \\ b_{21}, & \ldots, & b_{2 q_2} \end{array} \left| \frac{x}{\omega}, \frac{y}{\omega}\right.\right)$$

Remark: This relationship only holds true when the parameters satisfy certain well-specified restrictions.

Hankel transforms

07.34.22.0008.01

$$\mathcal{H}_{t,\nu}\left[t^{\alpha-1} G_{p,q}^{m,n}\left(\omega t^{\frac{2 l}{k}} \left| \begin{array}{l} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{array}\right.\right)\right](z) = \frac{k^\mu (2 l)^{\alpha - \frac{1}{2}} z^{-\alpha}}{(2 \pi)^{c^* (k-1)}} G_{k p+2 l, k q}^{k m, k n+l}\left(\frac{\omega^k (2 l)^{2 l}}{z^{2 l} k^{k (q-p)}} \left| \begin{array}{l} \frac{1-(\alpha+\nu+1/2)/2}{l}, \ldots, \frac{l-(\alpha+\nu+1/2)/2}{l}, \frac{a_1}{k}, \ldots, \\ \frac{b_1}{k}, \ldots, \end{array}\right.\right.$$

$$k \in \mathbb{N}^+ \bigwedge l \in \mathbb{N}^+ \bigwedge \gcd(k, l) = 1 \bigwedge \left(\mathbb{CC} /; \alpha \to \frac{2 \alpha + 1}{4} \bigwedge \sigma = \frac{z^2}{4} \bigwedge s = 1 \bigwedge t = u = 0 \bigwedge v = 2 \bigwedge d_1 = -d_2 = \frac{\nu}{2}\right)$$

Hilbert transform

07.34.22.0009.01

$$\mathcal{H}_t[f(t)](x) = -G_{p+2,q+2}^{m+1,n+1}\left(\omega x \middle| \begin{matrix} 0, a_1, \ldots, a_n, a_{n+1}, \ldots, a_p, -\frac{1}{2} \\ 0, b_1, \ldots, b_m, b_{m+1}, \ldots, b_q, -\frac{1}{2} \end{matrix}\right) - \frac{1}{\pi} G_{p+1,q+1}^{m+1,n+1}\left(-\omega x \middle| \begin{matrix} 0, a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ 0, b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) /;$$

$$x \in \mathbb{R} \bigwedge \left(\mathbb{CC} /; \sigma = \frac{1}{x} \bigwedge \alpha = k = l = s = t = 1 \bigwedge u = v = 2 \bigwedge c_1 = d_1 = 0 \bigwedge c_2 = d_2 = \frac{1}{2}\right) \bigwedge$$

$$\left(\mathbb{CC} /; \alpha = 1 \bigwedge \sigma = \frac{1}{x} \bigwedge \omega \to -\omega \wedge \alpha = k = l = s = t = u = v = 1 \wedge c_1 = d_1 = 0\right)$$

Operations

Limit operation

07.34.25.0001.01

$$\lim_{z \to -1} (z+1)^{-\psi_q} G_{q,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \Gamma(-\psi_q) \sum_{h=1}^{m} \frac{e^{\pi i b_h} \prod_{k=n+1}^{q} \sin((a_k - b_h)\pi)}{\prod_{\substack{k=1 \\ k \neq h}}^{m} \sin((b_k - b_h)\pi)} /;$$

$$m + n = q + 1 \bigwedge \left(\psi_q = -\mu = \sum_{j=1}^{q} (a_j - b_j) - 1 /; p = q\right) \bigwedge \operatorname{Re}(\psi_q) < 0 \bigwedge \psi_q \notin \mathbb{Z}$$

07.34.25.0002.01

$$\lim_{z \to -1} (1-z)^{-\psi_q} G_{q,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \frac{\Gamma(-\psi_q)}{\pi} \sum_{h=1}^{m} \frac{\prod_{k=n+1}^{q} \sin((a_k - b_h)\pi)}{\prod_{\substack{k=1 \\ k \neq h}}^{m} \sin((b_k - b_h)\pi)} /;$$

$$m + n = q \bigwedge \left(\psi_q = -\mu = \sum_{j=1}^{q} (a_j - b_j) - 1 /; p = q\right) \bigwedge \operatorname{Re}(\psi_q) < 0 \bigwedge \psi_q \notin \mathbb{Z} \bigwedge |z| < 1$$

07.34.25.0003.01

$$\lim_{z \to -1} (z-1)^{-\psi_q} G_{q,q}^{m,n}\left(z \middle| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_q \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \frac{\Gamma(-\psi_q)}{\pi} \sum_{h=1}^{n} \frac{\prod_{k=m+1}^{q} \sin((a_h - b_k)\pi)}{\prod_{\substack{k=1 \\ k \neq h}}^{n} \sin((a_h - a_k)\pi)} /;$$

$$m + n = q \bigwedge \left(\psi_q = -\mu = \sum_{j=1}^{q} (a_j - b_j) - 1 /; p = q\right) \bigwedge \operatorname{Re}(\psi_q) < 0 \bigwedge \psi_q \notin \mathbb{Z} \bigwedge |z| > 1$$

07.34.25.0004.01

$$\lim_{z\to -1}\frac{1}{\log(1+z)}G_{q,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_q\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=-\sum_{h=1}^{m}\frac{e^{\pi i b_h}\prod_{k=n+1}^{q}\sin((a_k-b_h)\pi)}{\prod_{\substack{k=1\\k\neq h}}^{m}\sin((b_k-b_h)\pi)}\;/;$$

$$m+n=q+1\bigwedge\left(\psi_q=-\mu=\sum_{j=1}^{q}(a_j-b_j)-1\;/;\;p=q\right)\bigwedge\psi_q=0$$

07.34.25.0005.01

$$\lim_{a_1\to\infty}\frac{1}{\Gamma(1-a_1)}G_{p,q}^{m,n}\left(-\frac{z}{a_1}\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=G_{p-1,q}^{m,n-1}\left(z\,\middle|\,\begin{matrix}a_2,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)$$

07.34.25.0006.01

$$\lim_{a_p\to\infty}\Gamma(a_p)\,G_{p,q}^{m,n}\left(\frac{z}{a_p}\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=G_{p-1,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_{p-1}\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)$$

07.34.25.0007.01

$$\lim_{b_1\to\infty}\frac{1}{\Gamma(b_1)}G_{p,q}^{m,n}\left(b_1\,z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=G_{p,q-1}^{m-1,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_2,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)$$

07.34.25.0008.01

$$\lim_{b_q\to\infty}\Gamma(1-b_q)\,G_{p,q}^{m,n}\left(-b_q\,z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=G_{p,q-1}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_{q-1}\end{matrix}\right)$$

Representations through more general functions

Through hypergeometric functions

Hypergeometric functions are not more general than Meijer G function.

Involving ${}_p\tilde{F}_q$

07.34.26.0001.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=\pi^{m-1}\sum_{k=1}^{m}\frac{\prod_{j=1}^{n}\Gamma(1-a_j+b_k)}{\prod_{\substack{j=1\\j\neq k}}^{m}\sin(\pi(b_j-b_k))\prod_{j=n+1}^{p}\Gamma(a_j-b_k)}z^{b_k}$$

$${}_p\tilde{F}_{q-1}(1-a_1+b_k,\,\ldots,\,1-a_p+b_k;\,1-b_1+b_k,\,\ldots,\,1-b_{k-1}+b_k,\,1-b_{k+1}+b_k,\,\ldots,\,1-b_q+b_k;\,(-1)^{p-m-n}z)\;/;$$

$$((p<q)\bigvee(p=q\bigwedge m+n>p)\bigvee(p=q\bigwedge m+n=p\bigwedge |z|<1))\bigwedge\forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\bigwedge j\neq k\bigwedge 1\leq j\leq m\bigwedge 1\leq k\leq m}(b_j-b_k\notin\mathbb{Z})$$

07.34.26.0002.01

$$G_{p,q}^{m,n}\left(z\,\middle|\,\begin{matrix}a_1,\,\ldots,\,a_n,\,a_{n+1},\,\ldots,\,a_p\\ b_1,\,\ldots,\,b_m,\,b_{m+1},\,\ldots,\,b_q\end{matrix}\right)=\pi^{n-1}\sum_{k=1}^{n}\frac{\prod_{j=1}^{m}\Gamma(1-a_k+b_j)}{\prod_{\substack{j=1\\j\neq k}}^{n}\sin(\pi(a_k-a_j))\prod_{j=m+1}^{q}\Gamma(a_k-b_j)}z^{a_k-1}$$

$${}_q\tilde{F}_{p-1}\left(1-a_k+b_1,\,\ldots,\,1-a_k+b_q;\,1+a_1-a_k,\,\ldots,\,1+a_{k-1}-a_k,\,1+a_{k+1}-a_k,\,\ldots,\,1+a_p-a_k;\,\frac{(-1)^{q-m-n}}{z}\right)\;/;$$

$$((p>q)\bigvee(p=q\bigwedge m+n=p+1\bigwedge z\notin(-1,0))\bigvee(p=q\bigwedge m+n>p+1)\bigvee(p=q\bigwedge m+n=p\bigwedge |z|>1))\bigwedge$$
$$\forall_{\{j,k\},\{j,k\}\in\mathbb{Z}\bigwedge j\neq k\bigwedge 1\leq j\leq n\bigwedge 1\leq k\leq n}(a_j-a_k\notin\mathbb{Z})$$

07.34.26.0003.01

$$G_{p,p}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_p \end{matrix}\right) = \pi^{m-1} \sum_{k=1}^{m} \frac{\prod_{j=1}^{n} \Gamma(1-a_j+b_k)}{\prod_{\substack{j=1 \\ j\neq k}}^{m} \sin(\pi(b_j-b_k)) \prod_{j=n+1}^{p} \Gamma(a_j-b_k)} z^{b_k} \, {}_p\tilde{F}_{p-1}(1-a_1+b_k, \ldots, 1-a_p+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_p+b_k; (-1)^{p-m-n} z)\, \theta(1-|z|) + \pi^{n-1} \sum_{k=1}^{n} \frac{\prod_{j=1}^{m} \Gamma(1-a_k+b_j)}{\prod_{\substack{j=1 \\ j\neq k}}^{n} \sin(\pi(a_k-a_j)) \prod_{j=m+1}^{p} \Gamma(a_k-b_j)} z^{a_k-1} \, {}_p\tilde{F}_{p-1}\left(1-a_k+b_1, \ldots, 1-a_k+b_p; 1+a_1-a_k, \ldots, 1+a_{k-1}-a_k, 1+a_{k+1}-a_k, \ldots, 1+a_p-a_k; \frac{(-1)^{p-m-n}}{z}\right) \theta(|z|-1) \; /;$$

$$m+n = p \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq m \land 1\leq k\leq m} (b_j - b_k \notin \mathbb{Z}) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq n \land 1\leq k\leq n} (a_j - a_k \notin \mathbb{Z})$$

Involving ${}_pF_q$

07.34.26.0004.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j-b_k) \prod_{j=1}^{n} \Gamma(1-a_j+b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j-b_k) \prod_{j=m+1}^{q} \Gamma(1-b_j+b_k)} z^{b_k} \, {}_pF_{q-1}(1-a_1+b_k, \ldots, 1-a_p+b_k; 1-b_1+b_k, \ldots, 1-b_{k-1}+b_k, 1-b_{k+1}+b_k, \ldots, 1-b_q+b_k; (-1)^{p-m-n} z) \; /;$$

$$((p<q) \lor (p = q \land m+n > p) \lor (p = q \land m+n = p \land |z| < 1)) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq m \land 1\leq k\leq m} (b_j - b_k \notin \mathbb{Z})$$

07.34.26.0005.01

$$G_{p,q}^{m,n}\left(z \,\middle|\, \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix}\right) = \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{n} \Gamma(a_k-a_j) \prod_{j=1}^{m} \Gamma(1-a_k+b_j)}{\prod_{j=m+1}^{q} \Gamma(a_k-b_j) \prod_{j=n+1}^{p} \Gamma(a_j-a_k+1)} z^{a_k-1} \, {}_qF_{p-1}\left(1-a_k+b_1, \ldots, 1-a_k+b_q; 1+a_1-a_k, \ldots, 1+a_{k-1}-a_k, 1+a_{k+1}-a_k, \ldots, 1+a_p-a_k; \frac{(-1)^{q-m-n}}{z}\right) /;$$

$$((p>q) \lor (p = q \land m+n = p+1 \land z \notin (-1, 0)) \lor (p = q \land m+n > p+1) \lor (p = q \land m+n = p \land |z| > 1)) \land \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \land j\neq k \land 1\leq j\leq n \land 1\leq k\leq n} (a_j - a_k \notin \mathbb{Z})$$

07.34.26.0006.01

$$G_{p,p}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_p \end{matrix} \right.\right) = \sum_{k=1}^{m} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{m} \Gamma(b_j - b_k) \prod_{j=1}^{n} \Gamma(1 - a_j + b_k)}{\prod_{j=n+1}^{p} \Gamma(a_j - b_k) \prod_{j=m+1}^{p} \Gamma(1 - b_j + b_k)} z^{b_k} \, {}_pF_{p-1}(1 - a_1 + b_k, \ldots, 1 - a_p + b_k; 1 - b_1 + b_k, \ldots, 1 - b_{k-1} + b_k, 1 - b_{k+1} + b_k, \ldots, 1 - b_p + b_k; (-1)^{p-m-n} z)\, \theta(1 - |z|) + \sum_{k=1}^{n} \frac{\prod_{\substack{j=1 \\ j\neq k}}^{n} \Gamma(a_k - a_j) \prod_{j=1}^{m} \Gamma(1 - a_k + b_j)}{\prod_{j=m+1}^{p} \Gamma(a_k - b_j) \prod_{j=n+1}^{p} \Gamma(a_j - a_k + 1)} z^{a_k - 1} \, {}_pF_{p-1}\left(1 - a_k + b_1, \ldots, 1 - a_k + b_p; 1 + a_1 - a_k, \ldots, 1 + a_{k-1} - a_k, 1 + a_{k+1} - a_k, \ldots, 1 + a_p - a_k; \frac{(-1)^{p-m-n}}{z}\right) \theta(|z| - 1) \;/;$$

$$m + n = p \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \wedge j\neq k \wedge 1\le j\le m \wedge 1\le k\le m} (b_j - b_k \notin \mathbb{Z}) \bigwedge \forall_{\{j,k\},\{j,k\}\in\mathbb{Z} \wedge j\neq k \wedge 1\le j\le n \wedge 1\le k\le n} (a_j - a_k \notin \mathbb{Z})$$

Through G function of two variables

07.34.26.0007.01

$$G_{p,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right) \delta(x - 1) = G_{0,0:p,q:0,0}^{0,0:m,n:0,0}\left(\left| \begin{matrix} a_1, & \ldots, & a_p \\ b_1, & \ldots, & b_q \end{matrix} \right| \Big| \, z, x \right) /; x > -1$$

Through Fox *H*

07.34.26.0008.01

$$G_{p,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right) = H_{p,q}^{m,n}\left(z \left| \begin{matrix} \{a_1, 1\}, \ldots, \{a_n, 1\}, \{a_{n+1}, 1\}, \ldots, \{a_p, 1\} \\ \{b_1, 1\}, \ldots, \{b_m, 1\}, \{b_{m+1}, 1\}, \ldots, \{b_q, 1\} \end{matrix} \right.\right)$$

Through Meijer *G*

Generalized cases

07.34.26.0009.01

$$G_{p,q}^{m,n}\left(z \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right) = G_{p,q}^{m,n}\left(z, 1 \left| \begin{matrix} a_1, \ldots, a_n, a_{n+1}, \ldots, a_p \\ b_1, \ldots, b_m, b_{m+1}, \ldots, b_q \end{matrix} \right.\right)$$

Theorems

The Wigner distribution function for the Liouville potential

The Wigner distribution function $f_\varepsilon(x, p)$ for the Liouville potential with Hamiltonian $H = p^2 + e^{2x}$ at the energy ε can be expressed as

$$f_\varepsilon(x, p) = \frac{1}{4\pi^3} \sin\left(\pi\sqrt{\varepsilon}\right) 2^{2ip} e^{-x(1+2ip)} G_{0\times 4}^{4\times 0}\left(\frac{e^{4x}}{16} \left| \frac{1 + 2i\sqrt{\varepsilon}}{4}, \frac{1 - 2i\sqrt{\varepsilon}}{4}, \frac{1 + 2i\sqrt{\varepsilon} + 4ip}{4}, \frac{1 - 2i\sqrt{\varepsilon} + 4ip}{4} \right.\right).$$

History

S. Pincherle (1888); E.W. Barnes (1907, 1908); H. Mellin (1910);
E.T. Whittaker and G.N. Watson (1927); A.L. Dixon and W.L.Ferrar (1936); C.S.
Meijer (1936, 1941–1956); L.J. Slater (1966); Y.L. Luke (1969); A.M.
Mathai and R.K. Saxena (1973); O.I. Marichev (1978); A.P. Prudnikov, Y.A.
Brychkov and O.I. Marichev (1986).

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