Two Unknown Summation Formulae involving Contiguous relation

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Abstract

In this paper we have developed two summation formulae which are unknown. These formulae are developed with the help of contiguous relation and the formulae from Salahuddin et al.

Key Words: Special functions, Contiguous relation, Summation formulae, Salahuddin et al.

2010 MSC NO: 33C05, 33C20, 33C45, 33C60

1. INTRODUCTION AND RESULTS REQUIRED

Special functions are very useful according to their scope. So many problems related to the various areas of Science, Mathematical Analysis, Applied Mathematics can be solved by various types of special functions.

The discovery of a hypergeometric function has provided an intrinsic stimulation in the world of mathematics. It has also motivated the development of several domains such as complex functions, Riemann surfaces, differential equations, difference equations, arithmetic theory and so forth.

Summation formulae for hypergeometric function has an important role in applied mathematics.

Prudnikov et al [2, p.414] derived the following seven summation formulae

$${}_2F_1 \left[\begin{matrix} a, & -a ; \\ c & \end{matrix} ; \frac{1}{2} \right] = \frac{\sqrt{\pi} \Gamma(c)}{2^c} \left[\frac{1}{\Gamma(\frac{c+a+1}{2}) \Gamma(\frac{c-a}{2})} + \frac{1}{\Gamma(\frac{c+a}{2}) \Gamma(\frac{c-a+1}{2})} \right] \quad (1)$$

$${}_2F_1 \left[\begin{matrix} a, & 1-a ; \\ c & \end{matrix} ; \frac{1}{2} \right] = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-1}} \left[\frac{1}{\Gamma(\frac{c+a}{2}) \Gamma(\frac{c-a+1}{2})} \right] \quad (2)$$

$${}_2F_1 \left[\begin{matrix} a, & 2-a ; \\ c & \end{matrix} ; \frac{1}{2} \right] = \frac{\sqrt{\pi} \Gamma(c)}{(a-1) 2^{c-2}} \left[\frac{1}{\Gamma(\frac{c+a-2}{2}) \Gamma(\frac{c-a+1}{2})} - \frac{1}{\Gamma(\frac{c+a-1}{2}) \Gamma(\frac{c-a}{2})} \right] \quad (3)$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 3-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] \\
&= \frac{\sqrt{\pi} \Gamma(c)}{(a-1)(a-2) 2^{c-3}} \left[\frac{(c-2)}{\Gamma(\frac{c+a-2}{2}) \Gamma(\frac{c-a+1}{2})} \right. \\
&\quad \left. - \frac{2}{\Gamma(\frac{c+a-3}{2}) \Gamma(\frac{c-a}{2})} \right]
\end{aligned} \tag{4}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 4-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] \\
&= \frac{\sqrt{\pi} \Gamma(c)}{(1-a)(2-a)(3-a) 2^{c-4}} \left[\frac{(a-2c+3)}{\Gamma(\frac{c+a-4}{2}) \Gamma(\frac{c-a+1}{2})} \right. \\
&\quad \left. + \frac{(a+2c-7)}{\Gamma(\frac{c+a-3}{2}) \Gamma(\frac{c-a}{2})} \right]
\end{aligned} \tag{5}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 5-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] \\
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-5} \{\prod_{\gamma=1}^4 (\gamma-a)\}} \left[\frac{\{2(c-2)(c-4) - (a-1)(a-4)\}}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-4}{2})} \right. \\
&\quad \left. + \frac{(12-4c)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-5}{2})} \right]
\end{aligned} \tag{6}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 6-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-6} \{\prod_{\delta=1}^5 (\delta-a)\}} \left[\frac{(4c^2 + 2ac - a^2 - a - 34c + 62)}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-5}{2})} \right. \\
&\quad \left. - \frac{(4c^2 - 2ac - a^2 + 13a - 22c + 20)}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-6}{2})} \right]
\end{aligned} \tag{7}$$

The contiguous relation is defined as Abramowitz et al[1,p.558]

$$\begin{aligned}
& b {}_2F_1 \left[\begin{matrix} a, & b+1 ; \\ c & ; \end{matrix} \quad z \right] \\
&= (b-c+1) {}_2F_1 \left[\begin{matrix} a, & b ; \\ c & ; \end{matrix} \quad z \right] + (c \\
&\quad - 1) {}_2F_1 \left[\begin{matrix} a, & b ; \\ c-1 & ; \end{matrix} \quad z \right]
\end{aligned} \tag{8}$$

Salahuddin et al[2,4,5,6,7,8,9] derived the following summation formulae

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 7-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-7} \{\prod_{\varsigma=1}^6 (\varsigma-a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-6}{2})} (-3a^2c + 12a^2 + 21ac - 84a + 4c^3 - 48c^2 + 158c \right. \\
&\quad \left. - 120) + \right]
\end{aligned}$$

$$+ \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-7}{2})} (2a^2 - 14a - 8c^2 + 64c - 108)] \quad (9)$$

$$\begin{aligned} & {}_2F_1 \left[\begin{matrix} a, & 8-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\ & = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-8} \{\prod_{\xi=1}^7 (\xi - a)\}} \left[\frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-7}{2})} (-a^3 - 4a^2c + 30a^2 + 4ac^2 - 4ac - 107a + 8c^3 \right. \\ & \quad \left. - 124c^2 + 576c - 762) + \right. \\ & \quad \left. + \frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-8}{2})} (-a^3 + 4a^2c - 6a^2 + 4ac^2 - 68ac + 181a \right. \\ & \quad \left. - 8c^3 + 92c^2 - 288c + 210) \right] \quad (10) \end{aligned}$$

$$\begin{aligned} & {}_2F_1 \left[\begin{matrix} a, & 9-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\ & = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-9} \{\prod_{\omega=1}^8 (\omega - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-8}{2})} (a^4 - 18a^3 - 8a^2c^2 + 80a^2c - 85a^2 + 72ac^2 \right. \\ & \quad \left. - 720ac + 1494a + 8c^4 - \right. \\ & \quad \left. - 160c^3 + 1056c^2 - 2560c + 1680) + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-9}{2})} (8a^2c \right. \\ & \quad \left. - 40a^2 - 72ac + 360a - 16c^3 + 240c^2 - 1072c \right. \\ & \quad \left. + 1360) \right] \quad (11) \end{aligned}$$

$$\begin{aligned} & {}_2F_1 \left[\begin{matrix} a, & 10-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\ & = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-10} \{\prod_{v=1}^9 (v - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-10}{2})} (-a^4 - 4a^3c + 42a^3 + 12a^2c^2 - 72a^2c - 107a^2 \right. \\ & \quad \left. + 8ac^3 - 252ac^2 + \right. \\ & \quad \left. + 1772ac - 3054a - 16c^4 + 312c^3 - 2000c^2 + 4704c - 3024) + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-9}{2})} (a^4 - 4a^3c \right. \\ & \quad \left. + 2a^3 - 12a^2c^2 + 192a^2c - \right. \\ & \quad \left. - 553a^2 + 8ac^3 - 12ac^2 - 868ac + 3406a + 16c^4 - 392c^3 \right. \\ & \quad \left. + 3320c^2 - 11224c + 12264) \right] \quad (12) \end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, & 11-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-11} \{\prod_{\varphi=1}^{10} (\varphi - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-10}{2})} (5a^4c - 30a^4 - 110a^3c + 660a^3 - 20a^2c^3 \right. \\
&\quad \left. + 360a^2c^2 - 1305a^2c - \right. \\
&\quad \left. -810a^2 + 220ac^3 - 3960ac^2 + 21010ac - 31020a + 16c^5 - 480c^4 + 5240c^3 - 25200c^2 \right. \\
&\quad \left. + 50544c - 30240) + \right. \\
&\quad \left. + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-11}{2})} (-2a^4 + 44a^3 + 24a^2c^2 - 288a^2c + 530a^2 - 264ac^2 + 3168ac - 8492a \right. \\
&\quad \left. - 32c^4 + 768c^3 - 6352c^2 + \right. \\
&\quad \left. + 20928c - 22320) \right] \quad (13)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, 12-a; \\ c; \end{matrix} \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-12} \{\prod_{\chi=1}^{11} (\chi - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-12}{2})} (a^5 - 6a^4c + 9a^4 - 12a^3c^2 + 300a^3c - 1103a^3 \right. \\
&\quad \left. + 32a^2c^3 - \right. \\
&\quad \left. -408a^2c^2 + 46a^2c + 6351a^2 + 16ac^4 - 800ac^3 + 10364ac^2 - 46852ac + 62182a - 32c^5 \right. \\
&\quad \left. + 944c^4 - 10112c^3 + 47656c^2 - \right. \\
&\quad \left. -93776c + 55440) + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-11}{2})} (a^5 + 6a^4c - 69a^4 - 12a^3c^2 + 12a^3c + 769a^3 \right. \\
&\quad \left. - 32a^2c^3 + 840a^2c^2 - \right. \\
&\quad \left. -5662a^2c + 8301a^2 + 16ac^4 - 32ac^3 - 4612ac^2 + 42380ac - 96002a + 32c^5 - 1136c^4 \right. \\
&\quad \left. + 15104c^3 - \right. \\
&\quad \left. -92536c^2 + 255392c - 245640) \right] \quad (14)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, 13-a; \\ c; \end{matrix} \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-13} \{\prod_{\beta=1}^{12} (\beta - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-12}{2})} (-a^6 + 39a^5 + 18a^4c^2 - 252a^4c + 275a^4 \right. \\
&\quad \left. - 468a^3c^2 + 6552a^3c \right. \\
&\quad \left. -18135a^3 - 48a^2c^4 + 1344a^2c^3 - 9834a^2c^2 + 5964a^2c + 74246a^2 + 624ac^4 - 17472ac^3 \right. \\
&\quad \left. + 167388ac^2 - 631176ac \right. \\
&\quad \left. + 752856a + 32c^6 - 1344c^5 + 21824c^4 - 172032c^3 + 674384c^2 - 1187424c + 665280) + \right.
\end{aligned}$$

$$\begin{aligned}
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-13}{2})} (-12a^4c + 84a^4 + 312a^3c - 2184a^3 + 64a^2c^3 - 1344a^2c^2 \\
& + 6620a^2c - 2436a^2 - 832ac^3 + 17472ac^2 - 112424ac + 216216a - 64c^5 + 2240c^4 \\
& - 29312c^3 + 176512c^2 - \\
& - 478752c + 453600)] \quad (15)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 14-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-14} \{\prod_{\sigma=1}^{13} (\sigma - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-14}{2})} (a^6 + 6a^5c - 87a^5 - 24a^4c^2 + 150a^4c + 925a^4 \right. \\
& \quad \left. - 32a^3c^3 + 1392a^3c^2 \right. \\
& - 12706a^3c + 24615a^3 + 80a^2c^4 - 1728a^2c^3 + 5368a^2c^2 + 58986a^2c - 242486a^2 + 32ac^5 \\
& \quad \left. - 2320ac^4 + 47328ac^3 \right. \\
& \quad \left. - 391568ac^2 + 1344076ac - 1496568a - 64c^6 + 2656c^5 - 42560c^4 + 330752c^3 \right. \\
& \quad \left. - 1278144c^2 + 2222160c - 1235520) + \right. \\
& \quad \left. + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-13}{2})} (-a^6 + 6a^5c - \right. \\
& \quad \left. - 3a^5 + 24a^4c^2 - 570a^4c + 2225a^4 - 32a^3c^3 + 48a^3c^2 + 7454a^3c - 39225a^3 - 80a^2c^4 \right. \\
& \quad \left. + 3072a^2c^3 - 35608a^2c^2 + 133626a^2c - \right. \\
& \quad \left. - 68104a^2 + 32ac^5 - 80ac^4 - 19872ac^3 + 313808ac^2 - 1676564ac + 2856228a + 64c^6 \right. \\
& \quad \left. - 3104c^5 + 59360c^4 - 566848c^3 + \right. \\
& \quad \left. + 2810304c^2 - 6724560c + 5897520) \right] \quad (16)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 15-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-15} \{\prod_{\varepsilon=1}^{14} (\varepsilon - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-14}{2})} (-7a^6c + 56a^6 + 315a^5c - 2520a^5 + 56a^4c^3 \right. \\
& \quad \left. - 1344a^4c^2 + 5103a^4c + \right. \\
& \quad \left. + 16520a^4 - 1680a^3c^3 + 40320a^3c^2 - 271215a^3c + 449400a^3 - 112a^2c^5 + 4480a^2c^4 \right. \\
& \quad \left. - 54040a^2c^3 + 150080a^2c^2 + 845824a^2c - \right. \\
& \quad \left. - 3383296a^2 + 1680ac^5 - 67200ac^4 + 999600ac^3 - 6787200ac^2 + 20482140ac \right. \\
& \quad \left. - 21070560a + 64c^7 - 3584c^6 + 80864c^5 - \right.
\end{aligned}$$

$$\begin{aligned}
& -940800c^4 + 5987520c^3 - 20296192c^2 + 32464368c - 17297280) \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-15}{2})} (2a^6 - 90a^5 - 48a^4c^2 + 768a^4c - \\
& -1474a^4 + 1440a^3c^2 - 23040a^3c + 77970a^3 + 160a^2c^4 - 5120a^2c^3 + 46640a^2c^2 \\
& - 90880a^2c - 226192a^2 - 2400ac^4 + \\
& +76800ac^3 - 861600ac^2 + 3955200ac - 6138120a - 128c^6 + 6144c^5 - 116160c^4 \\
& + 1095680c^3 - 5363584c^2 + \\
& +12679168c - 11009376)] \quad (17)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, 16-a ; \\ c \end{matrix} ; \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-16} \{\prod_{\zeta=1}^{15} (\zeta - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-16}{2})} (-a^7 + 8a^6c - 12a^6 + 24a^5c^2 - 792a^5c \right. \\
& \quad \left. + 3710a^5 - 80a^4c^3 + 1080a^4c^2 + \right. \\
& \quad \left. + 6280a^4c - 66600a^4 - 80a^3c^4 + 5280a^3c^3 - 85480a^3c^2 + 435480a^3c - 458929a^3 \right. \\
& \quad \left. + 192a^2c^5 - 6240a^2c^4 + 45200a^2c^3 + \right. \\
& \quad \left. + 271560a^2c^2 - 3746640a^2c + 8942052a^2 + 64ac^6 - 6336ac^5 + 186000ac^4 \right. \\
& \quad \left. - 2408160ac^3 + 15005072ac^2 - 42553152ac + \right. \\
& \quad \left. + 41722740a - 128c^7 + 7104c^6 - 158720c^5 + 1827360c^4 - 11505152c^3 + 38596416c^2 \right. \\
& \quad \left. - 61194240c + 32432400) + \right. \\
& \quad \left. + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-15}{2})} (-a^7 - 8a^6c + 124a^6 + 24a^5c^2 - 24a^5c - 2818a^5 + 80a^4c^3 - 3000a^4c^2 \right. \\
& \quad \left. + 26360a^4c - 40760a^4 - 80a^3c^4 + \right. \\
& \quad \left. + 160a^3c^3 + 45080a^3c^2 - 534760a^3c + 1499471a^3 - 192a^2c^5 + 10080a^2c^4 - 175760a^2c^3 \right. \\
& \quad \left. + 1189560a^2c^2 - 2226480a^2c - \right. \\
& \quad \left. - 2760884a^2 + 64ac^6 - 192ac^5 - 75120ac^4 + 1782560ac^3 - 16394608ac^2 + 65703616ac \right. \\
& \quad \left. - 93008652a + 128c^7 - 8128c^6 + \right. \\
& \quad \left. + 210944c^5 - 2878240c^4 + 22080512c^3 - 94015552c^2 \right. \\
& \quad \left. + 202146816c - 165145680) \right] \quad (18)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, 17-a ; \\ c \end{matrix} ; \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-17} \{\prod_{\vartheta=1}^{16} (\vartheta - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-16}{2})} (a^8 - 68a^7 - 32a^6c^2 + 576a^6c - 638a^6 \right. \\
&\quad \left. + 1632a^5c^2 - 29376a^5c + 101320a^5 + \right. \\
&\quad \left. + 160a^4c^4 - 5760a^4c^3 + 44640a^4c^2 + 129600a^4c - 1341071a^4 - 5440a^3c^4 + 195840a^3c^3 \right. \\
&\quad \left. - 2303840a^3c^2 + \right. \\
&\quad \left. + 9743040a^3c - 9832052a^3 - 256a^2c^6 + 13824a^2c^5 - 246560a^2c^4 + 1411200a^2c^3 \right. \\
&\quad \left. + 4297408a^2c^2 - 64103040a^2c + \right. \\
&\quad \left. + 143207628a^2 + 4352ac^6 - 235008ac^5 + 4977600ac^4 - 52289280ac^3 + 282566656ac^2 \right. \\
&\quad \left. - 727036416ac + 670152240a + \right. \\
&\quad \left. + 128c^8 - 9216c^7 + 275456c^6 - 4423680c^5 + 41249792c^4 - 224907264c^3 \right. \\
&\quad \left. + 683065344c^2 - 1014128640c + 518918400 + \right. \\
&\quad \left. + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-17}{2})} (16a^6c - 144a^6 - 816a^5c + 7344a^5 - 160a^4c^3 + 4320a^4c^2 - 22480a^4c \right. \\
&\quad \left. - 30960a^4 + 5440a^3c^3 - \right. \\
&\quad \left. - 146880a^3c^2 + 1157360a^3c - 2484720a^3 + 384a^2c^5 - 17280a^2c^4 + 247840a^2c^3 \right. \\
&\quad \left. - 1092960a^2c^2 - 1901760a^2c + \right. \\
&\quad \left. + 15669504a^2 - 6528ac^5 + 293760ac^4 - 4999360ac^3 + 39804480ac^2 - 146267456ac \right. \\
&\quad \left. + 194890176a - 256c^7 + 16128c^6 - \right. \\
&\quad \left. - 414976c^5 + 5610240c^4 - 42628864c^3 + 179788032c^2 \right. \\
&\quad \left. - 383195904c + 310867200) \right] \tag{19}
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, 18-a; \\ c; \end{matrix} \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-18} \{\prod_{\eta=1}^{17} (\eta - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-18}{2})} (-a^8 - 8a^7c + 148a^7 + 40a^6c^2 - 256a^6c \right. \\
&\quad \left. - 3362a^6 + 80a^5c^3 - 4440a^5c^2 + \right. \\
&\quad \left. + 49664a^5c - 103400a^5 - 240a^4c^4 + 5520a^4c^3 + 18760a^4c^2 - 849520a^4c + 3240271a^4 \right. \\
&\quad \left. - 192a^3c^5 + 17760a^3c^4 - 440560a^3c^3 + \right. \\
&\quad \left. + 4091160a^3c^2 - 12923320a^3c + 3622852a^3 + 448a^2c^6 - 20352a^2c^5 + 253360a^2c^4 \right. \\
&\quad \left. + 576240a^2c^3 - 31091248a^2c^2 + \right. \\
&\quad \left. + 192701168a^2c - 344444908a^2 + 128ac^7 - 16576ac^6 + 660032ac^5 - 12228640ac^4 \right. \\
&\quad \left. + 118499872ac^3 - 604789504ac^2 + \right. \\
&\quad \left. + 1488844864ac - 1324543920a - 256c^8 + 18304c^7 - 542976c^6 + 8650240c^5 \right. \\
&\quad \left. - 79993344c^4 + 432549376c^3 - 1303568384c^2 + \right.
\end{aligned}$$

$$\begin{aligned}
& +1923025920c - 980179200) + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-17}{2})} (a^8 - 8a^7c + 4a^7 - 40a^6c^2 + 1264a^6c \\
& - 6214a^6 + 80a^5c^3 - 120a^5c^2 - \\
& -32416a^5c + 213904a^5 + 240a^4c^4 - 12720a^4c^3 + 186440a^4c^2 - 743120a^4c - 456391a^4 \\
& - 192a^3c^5 + 480a^3c^4 + 216080a^3c^3 - \\
& -4278120a^3c^2 + 27569480a^3c - 52277444a^3 - 448a^2c^6 + 30720a^2c^5 - 745840a^2c^4 \\
& + 7817520a^2c^3 - 30345632a^2c^2 - \\
& -19224224a^2c + 253516684a^2 + 128ac^7 - 448ac^6 - 259264ac^5 + 8556320ac^4 \\
& - 118218848ac^3 + 813195488ac^2 - \\
& -2692403360ac + 3335839536a + 256c^8 - 20608c^7 + 696192c^6 - 12817024c^5 \\
& + 139638144c^4 - 913535872c^3 + 3463541888c^2 - \\
& -6848013696c + 5284782720)] \quad (20)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, 19-a ; \\ c ; \end{matrix} \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-19} \{\prod_{\lambda=1}^{18} (\lambda - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-18}{2})} (9a^8c - 90a^8 - 684a^7c + 6840a^7 - 120a^6c^3 \right. \\
& \quad + 3600a^6c^2 - 14046a^6c - 99540a^6 + \\
& \quad + 6840a^5c^3 - 205200a^5c^2 + 1664856a^5c - 2968560a^5 + 432a^4c^5 - 21600a^4c^4 \\
& \quad + 277080a^4c^3 + 327600a^4c^2 - 20793831a^4c + \\
& \quad + 70898310a^4 - 16416a^3c^5 + 820800a^3c^4 - 14644440a^3c^3 + 111013200a^3c^2 \\
& \quad - 315518940a^3c + 131909400a^3 - 576a^2c^7 + \\
& \quad + 40320a^2c^6 - 992880a^2c^5 + 9324000a^2c^4 + 4429536a^2c^3 - 636886080a^2c^2 \\
& \quad + 3695816316a^2c - 6211091160a^2 + 10944ac^7 - \\
& \quad - 766080ac^6 + 21827808ac^5 - 325310400ac^4 + 2707726176ac^3 - 12394025280ac^2 \\
& \quad + 28254838896ac - 23908836960a + 256c^9 - \\
& \quad - 23040c^8 + 880512c^7 - 18627840c^6 + 238347264c^5 - 1891123200c^4 + 9158978048c^3 \\
& \quad - 25507261440c^2 + 35661692160c - \\
& \quad - 17643225600) + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-19}{2})} (-2a^8 + 152a^7 + 80a^6c^2 - 1600a^6c + 3148a^6 \\
& \quad - 4560a^5c^2 + 91200a^5c - 371488a^5 - \\
& \quad - 480a^4c^4 + 19200a^4c^3 - 185680a^4c^2 - 126400a^4c + 4559182a^4 + 18240a^3c^4 \\
& \quad - 729600a^3c^3 + 9799440a^3c^2 - 50068800a^3c +
\end{aligned}$$

$$\begin{aligned}
& +73373288a^3 + 896a^2c^6 - 53760a^2c^5 + 1107680a^2c^4 - 8467200a^2c^3 - 743936a^2c^2 \\
& + 274718720a^2c - 822056088a^2 - \\
& -17024ac^6 + 1021440ac^5 - 24338240ac^4 + 292569600ac^3 - 1853708096ac^2 \\
& + 5798641920ac - 6885423072a - \\
& -512c^8 + 40960c^7 - 1374464c^6 + 25123840c^5 - 271685888c^4 + 1764075520c^3 \\
& - 6639757056c^2 + 13042437120c - \\
& -10013310720)] \tag{21}
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 20-a; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-20} \{\prod_{Y=1}^{19} (Y-a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-20}{2})} (33522128640 + 47215599696a \right. \\
& \quad + 14182895460a^2 + 345040520a^3 - \\
& \quad -140133105a^4 + 962073a^5 + 330750a^6 - 9330a^7 + 15a^8 + a^9 - 67958134272c \\
& \quad - 57343402272ac - 9605975576a^2c + \\
& \quad + 295428296a^3c + 58846422a^4c - 2100880a^5c - 32820a^6c + 1640a^7c - 10a^8c \\
& \quad + 48842214912c^2 + \\
& \quad + 25998562336ac^2 + 2187966784a^2c^2 - 168954152a^3c^2 - 6101120a^4c^2 + 380720a^5c^2 \\
& \quad - 2240a^6c^2 - 40a^7c^2 - 17641896960c^3 - \\
& \quad -5917427456ac^3 - 182014144a^2c^3 + 27821280a^3c^3 - 9440a^4c^3 - 19680a^5c^3 + 160a^6c^3 \\
& \quad + 3666323456c^4 + 750095264ac^4 - \\
& \quad -1895280a^2c^4 - 1926160a^3c^4 + 23280a^4c^4 + 240a^5c^4 - 465172736c^5 - 54369728ac^5 \\
& \quad + 1155616a^2c^5 + 55104a^3c^5 - 672a^4c^5 + \\
& \quad + 36595328c^6 + 2174144ac^6 - 61824a^2c^6 - 448a^3c^6 - 1740800c^7 - 41984ac^7 \\
& \quad + 1024a^2c^7 + 45824c^8 + 256ac^8 - 512c^9) + \\
& \quad + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-19}{2})} (-190253266560 - 131460917904a - 15315714660a^2 \\
& \quad + 1718684120a^3 + 100625805a^4 - 10839927a^5 + \\
& \quad + 135450a^6 + 7470a^7 - 195a^8 + a^9 + 258458522112c + 117489033888ac \\
& \quad + 5199265016a^2c - 1259577944a^3c + 961578a^4c + \\
& \quad + 3256720a^5c - 84780a^6c + 40a^7c + 10a^8c - 139931759232c^2 - 40815588704ac^2 \\
& \quad + 198370336a^2c^2 + 283436248a^3c^2 -
\end{aligned}$$

$$\begin{aligned}
& -7330880a^4c^2 - 224080a^5c^2 + 7840a^6c^2 - 40a^7c^2 + 40472263680c^3 + 7213462784ac^3 \\
& - 274206656a^2c^3 - 26053920a^3c^3 + \\
& +1017440a^4c^3 - 480a^5c^3 - 160a^6c^3 - 6993636736c^4 - 700147936ac^4 + 42392880a^2c^4 \\
& + 896240a^3c^4 - 47280a^4c^4 + 240a^5c^4 + \\
& +757008896c^5 + 36475712ac^5 - 2849056a^2c^5 + 1344a^3c^5 + 672a^4c^5 - 51764608c^6 \\
& - 836416ac^6 + 88704a^2c^6 - 448a^3c^6 + \\
& +2170880c^7 - 1024ac^7 - 1024a^2c^7 - 50944c^8 + 256ac^8 \\
& + 512c^9)] \quad (22)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 21-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-21} \{\prod_{\psi=1}^{20} (\Psi - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-20}{2})} (670442572800 + 946321185600a \right. \\
& \quad \left. + 284169369024a^2 + 4885689900a^3 - \right. \\
& \quad \left. -3333875180a^4 + 41694345a^5 + 10037727a^6 - 381150a^7 + 1230a^8 + 105a^9 - a^{10} \right. \\
& \quad \left. - 1394694005760c - 1198379286720ac - \right. \\
& \quad \left. -203053089360a^2c + 8433107760a^3c + 1530533620a^4c - 70408800a^5c - 1146200a^6c \right. \\
& \quad \left. + 92400a^7c - 1100a^8c + \right. \\
& \quad \left. +1048586614272c^2 + 578478838560ac^2 + 49539606520a^2c^2 - 4805882760a^3c^2 \right. \\
& \quad \left. - 177714670a^4c^2 + 15397200a^5c^2 - \right. \\
& \quad \left. -141500a^6c^2 - 4200a^7c^2 + 50a^8c^2 - 404078540800c^3 - 143591669760ac^3 \right. \\
& \quad \left. - 4354528640a^2c^3 + 902932800a^3c^3 - \right. \\
& \quad \left. -2094400a^4c^3 - 1108800a^5c^3 + 17600a^6c^3 + 91700259840c^4 + 20464187520ac^4 \right. \\
& \quad \left. - 122473120a^2c^4 - 77439600a^3c^4 + \right. \\
& \quad \left. +1402800a^4c^4 + 25200a^5c^4 - 400a^6c^4 - 13092907520c^5 - 1739633280ac^5 \right. \\
& \quad \left. + 50240960a^2c^5 + 3104640a^3c^5 - 73920a^4c^5 + \right. \\
& \quad \left. +1209103616c^6 + 87071040ac^6 - 3652320a^2c^6 - 47040a^3c^6 + 1120a^4c^6 - 72089600c^7 \right. \\
& \quad \left. - 2365440ac^7 + 112640a^2c^7 + \right. \\
& \quad \left. +2677760c^8 + 26880ac^8 - 1280a^2c^8 - 56320c^9 + 512c^{10} \right) \\
& \quad + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-21}{2})} (362387520000 + 268742591040a + \\
& \quad +41471452880a^2 - 1867829040a^3 - 305673060a^4 + 14303520a^5 + 225720a^6 \\
& \quad - 18480a^7 + 220a^8 - 494250063360c -
\end{aligned}$$

$$\begin{aligned}
& -247867413696ac - 19713479280a^2c + 1984361232a^3c + 69962284a^4c - 6179040a^5c \\
& + 56920a^6c + 1680a^7c - 20a^8c + \\
& + 268936121344c^2 + 89644203264ac^2 + 2511762176a^2c^2 - 547968960a^3c^2 \\
& + 1404480a^4c^2 + 665280a^5c^2 - 10560a^6c^2 - \\
& - 78226625536c^3 - 16719935232ac^3 + 112602112a^2c^3 + 62139840a^3c^3 - 1126720a^4c^3 \\
& - 20160a^5c^3 + 320a^6c^3 + \\
& + 13598953984c^4 + 1756191360ac^4 - 51029440a^2c^4 - 3104640a^3c^4 + 73920a^4c^4 \\
& - 1480941056c^5 - 104786304ac^5 + \\
& + 4397120a^2c^5 + 56448a^3c^5 - 1344a^4c^5 + 101871616c^6 + 3311616ac^6 - 157696a^2c^6 \\
& - 4296704c^7 - 43008ac^7 + 2048a^2c^7 + \\
& + 101376c^8 - 1024c^9] \quad (23) \\
& {}_2F_1 \left[\begin{matrix} a, & 22-a; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-22} \{\prod_{\varepsilon=1}^{21} (\varepsilon - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-22}{2})} (-1279935820800 - 1868233671360a \right. \\
& \quad \left. - 628352859744a^2 - \right. \\
& - 34417212780a^3 + 5753119700a^4 + 134236095a^5 - 20700687a^6 + 312270a^7 + 8730a^8 \\
& \quad \left. - 225a^9 + a^{10} + 2668809669120c + \right. \\
& + 2417863186656ac + 489345655848a^2c - 219480864a^3c - 3388493178a^4c \\
& \quad \left. + 53042458a^5c + 4970700a^6c - 142820a^7c + \right. \\
& + 390a^8c + 10a^9c - 2014029186048c^2 - 1197461040576ac^2 - 138256171792a^2c^2 \\
& \quad \left. + 5911683120a^3c^2 + 583619652a^4c^2 - \right. \\
& - 22165920a^5c^2 - 176120a^6c^2 + 10800a^7c^2 - 60a^8c^2 + 779711413248c^3 \\
& \quad \left. + 306554335232ac^3 + 17513420736a^2c^3 - \right. \\
& - 1499242976a^3c^3 - 32128320a^4c^3 + 2199680a^5c^3 - 13440a^6c^3 - 160a^7c^3 \\
& \quad \left. - 177857647616c^4 - 45404661120ac^4 - \right. \\
& - 823493664a^2c^4 + 154420560a^3c^4 - 467600a^4c^4 - 75600a^5c^4 + 560a^6c^4 \\
& \quad \left. + 25531683072c^5 + 4062167872ac^5 - \right. \\
& - 27880608a^2c^5 - 7519456a^3c^5 + 86688a^4c^5 + 672a^5c^5 - 2370643968c^6 \\
& \quad \left. - 219093504ac^6 + 4625152a^2c^6 + 161280a^3c^6 - \right. \\
& - 1792a^4c^6 + 142098432c^7 + 6765568ac^7 - 178176a^2c^7 - 1024a^3c^7 - 5305344c^8 \\
& \quad \left. - 103680ac^8 + 2304a^2c^8 + 112128c^9 + \right.
\end{aligned}$$

$$\begin{aligned}
& +512ac^9 - 1024c^{10}) + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-21}{2})} (7610141548800 + 5664039006240a \\
& + 862754799384a^2 - 50618670580a^3 - \\
& -7467040370a^4 + 438809595a^5 + 6355587a^6 - 793890a^7 + 14040a^8 - 5a^9 - a^{10} \\
& - 10762094073600c - 5490993903456ac - \\
& -428082370072a^2c + 53697863232a^3c + 1803933278a^4c - 214732742a^5c \\
& + 2793980a^6c + 100060a^7c - 2370a^8c + 10a^9c + \\
& +6167102701056c^2 + 2126343680320ac^2 + 53972779984a^2c^2 - 16286791024a^3c^2 \\
& + 92193948a^4c^2 + 28580160a^5c^2 - \\
& -673960a^6c^2 + 240a^7c^2 + 60a^8c^2 - 1923629552128c^3 - 434298545536ac^3 \\
& + 5057543680a^2c^3 + 2145900064a^3c^3 - \\
& -52633280a^4c^3 - 1200640a^5c^3 + 38080a^6c^3 - 160a^7c^3 + 366720941312c^4 \\
& + 51431687104ac^4 - 1928215296a^2c^4 - \\
& -133374640a^3c^4 + 4718000a^4c^4 - 1680a^5c^4 - 560a^6c^4 - 45108419328c^5 \\
& - 3603513536ac^5 + 200868192a^2c^5 + \\
& +3361568a^3c^5 - 160608a^4c^5 + 672a^5c^5 + 3654604800c^6 + 142266880ac^6 \\
& - 10065664a^2c^6 + 3584a^3c^6 + 1792a^4c^6 - \\
& -193800192c^7 - 2561024ac^7 + 245760a^2c^7 - 1024a^3c^7 \\
& + 6471168c^8 - 2304ac^8 - 2304a^2c^8 - 123392c^9 \\
& + 512ac^9 + 1024c^{10})] \quad (24)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, & 23-a ; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-23} \{\prod_{\Omega=1}^{22} (\Omega - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-22}{2})} (-28158588057600 - 41169473009280a \right. \\
& \quad - 13846175136288a^2 - \\
& -688985043120a^3 + 149373094200a^4 + 2886127860a^5 - 648260844a^6 + 12963720a^7 \\
& \quad + 382800a^8 - 15180a^9 + 132a^{10} + \\
& +60062080780800c + 55217638146528ac + 11293160726232a^2c - 82022959260a^3c \\
& \quad - 93645815450a^4c + 1995539777a^5c + \\
& +178029929a^6c - 6909430a^7c + 31460a^8c + 1265a^9c - 11a^{10}c - 47111453908992c^2 \\
& \quad - 28820579344128ac^2 - \\
& -3392485386048a^2c^2 + 183098051136a^3c^2 + 17810133264a^4c^2 - 867081600a^5c^2 \\
& \quad - 6985440a^6c^2 + 728640a^7c^2 - 7920a^8c^2 +
\end{aligned}$$

$$\begin{aligned}
& +19258856466432c^3 + 7922696165824ac^3 + 461791289168a^2c^3 - 49584004624a^3c^3 \\
& - 1091526436a^4c^3 + 105693280a^5c^3 - \\
& -988680a^6c^3 - 20240a^7c^3 + 220a^8c^3 - 4723308327936c^4 - 1289002826496ac^4 \\
& - 22320173568a^2c^4 + 5914856640a^3c^4 - \\
& -30824640a^4c^4 - 5100480a^5c^4 + 73920a^6c^4 + 745452131072c^5 + 130485126464ac^5 \\
& - 1364040832a^2c^5 - 359725520a^3c^5 + \\
& +6190800a^4c^5 + 85008a^5c^5 - 1232a^6c^5 - 78371758080c^6 - 8302221312ac^6 \\
& + 235834368a^2c^6 + 10881024a^3c^6 - \\
& -236544a^4c^6 + 5546010624c^7 + 322674176ac^7 - 12539648a^2c^7 - 129536a^3c^7 \\
& + 2816a^4c^7 - 260941824c^8 - 6994944ac^8 + \\
& +304128a^2c^8 + 7822848c^9 + 64768ac^9 - 2816a^2c^9 - 135168c^{10} + 1024c^{11}) \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-23}{2})} (-14558535129600 - \\
& -11503844032320a - 2137013714928a^2 + 23993967080a^3 + 17223845140a^4 \\
& - 382057830a^5 - 32189094a^6 + 1259940a^7 - \\
& -5760a^8 - 230a^9 + 2a^{10} + 20652447375360c + 11426734414848ac \\
& + 1249606186752a^2c - 70894693632a^3c - \\
& -6453736128a^4c + 319011840a^5c + 2486400a^6c - 264960a^7c + 2880a^8c \\
& - 11881425202176c^2 - 4559948772992ac^2 - \\
& -249358186400a^2c^2 + 27700361696a^3c^2 + 584111304a^4c^2 - 57805440a^5c^2 \\
& + 541520a^6c^2 + 11040a^7c^2 - 120a^8c^2 + \\
& +3722781351936c^3 + 967717718016ac^3 + 15372177408a^2c^3 - 4341281280a^3c^3 \\
& + 23278080a^4c^3 + 3709440a^5c^3 - \\
& -53760a^6c^3 - 713155826176c^4 - 120677707136ac^4 + 1319899392a^2c^4 \\
& + 327847520a^3c^4 - 5645920a^4c^4 - 77280a^5c^4 + \\
& +1120a^6c^4 + 88159518720c^5 + 9128189952ac^5 - 260370432a^2c^5 - 11870208a^3c^5 \\
& + 258048a^4c^5 - 7178121216c^6 - \\
& -411665408ac^6 + 16002560a^2c^6 + 164864a^3c^6 - 3584a^4c^6 + 382500864c^7 \\
& + 10174464ac^7 - 442368a^2c^7 - 12831744c^8 - \\
& -105984ac^8 + 4608a^2c^8 + 245760c^9 - 2048c^{10}]) \quad (25)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, & 24-a ; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-24} \{\prod_{v=1}^{23} (\nu - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-24}{2})} (53970627110400 + 81275748452640a \right. \\
&\quad + 29965288299912a^2 + \\
&\quad + 2450226723044a^3 - 225124440810a^4 - 14621050415a^5 + 1046631306a^6 \\
&\quad + 3307857a^7 - 1146390a^8 + 19675a^9 - 18a^{10} - \\
&\quad - a^{11} - 115335576760320c - 110963670941184ac - 26002256223296a^2c \\
&\quad - 677875698640a^3c + 179871679040a^4c + \\
&\quad + 1164213764a^5c - 418718356a^6c + 7202120a^7c + 106120a^8c - 2940a^9c + 12a^{10}c \\
&\quad + 90736096819200c^2 + \\
&\quad + 59116525645888ac^2 + 8571136553968a^2c^2 - 132498699168a^3c^2 - 43219364300a^4c^2 \\
&\quad + 885926748a^5c^2 + \\
&\quad + 41948200a^6c^2 - 1232440a^7c^2 + 4020a^8c^2 + 60a^9c^2 - 37229387082752c^3 \\
&\quad - 16647614537344ac^3 - 1382871809056a^2c^3 + \\
&\quad + 70301031136a^3c^3 + 4193488488a^4c^3 - 166658240a^5c^3 - 636720a^6c^3 + 54880a^7c^3 \\
&\quad - 280a^8c^3 + 9168624153856c^4 + \\
&\quad + 2788555498944ac^4 + 110886499136a^2c^4 - 10435825456a^3c^4 - 136259200a^4c^4 \\
&\quad + 10643360a^5c^4 - 64960a^6c^4 - \\
&\quad - 560a^7c^4 - 1453428736000c^5 - 292828010496ac^5 - 2923085312a^2c^5 \\
&\quad + 743957760a^3c^5 - 3395840a^4c^5 - 263424a^5c^5 + \\
&\quad + 1792a^6c^5 + 153495164928c^6 + 19572034048ac^6 - 185488128a^2c^6 - 27007232a^3c^6 \\
&\quad + 295680a^4c^6 + 1792a^5c^6 - \\
&\quad - 10911129600c^7 - 818236416ac^7 + 16882176a^2c^7 + 451584a^3c^7 - 4608a^4c^7 \\
&\quad + 515633664c^8 + 20126976ac^8 - \\
&\quad - 493056a^2c^8 - 2304a^3c^8 - 15523840c^9 - 250880ac^9 + 5120a^2c^9 + 269312c^{10} \\
&\quad + 1024ac^{10} - 2048c^{11}) + \\
&\quad + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-23}{2})} (-334846347897600 - 265325367396960a - 48906562552488a^2 \\
&\quad + 988440027044a^3 + \\
&\quad + 456572472690a^4 - 13283988815a^5 - 1027452594a^6 + 51835857a^7 - 355890a^8 \\
&\quad - 16325a^9 + 282a^{10} - a^{11} + \\
&\quad + 490301899960320c + 275033962166784ac + 29894874504896a^2c \\
&\quad - 2110031722960a^3c - 182994379040a^4c +
\end{aligned}$$

$$\begin{aligned}
& +11313648836a^5c + 75158356a^6c - 13480120a^7c + 217880a^8c - 60a^9c - 12a^{10}c \\
& - 294885357427200c^2 - \\
& -116251083614912ac^2 - 6231457365232a^2c^2 + 863633176032a^3c^2 \\
& + 17220272300a^4c^2 - 2360841252a^5c^2 + \\
& +30594200a^6c^2 + 783560a^7c^2 - 16980a^8c^2 + 60a^9c^2 + 97997531697152c^3 \\
& + 26592490242944ac^3 + 357545095456a^2c^3 - \\
& -150694485536a^3c^3 + 1256431512a^4c^3 + 188722240a^5c^3 - 4067280a^6c^3 + 1120a^7c^3 \\
& + 280a^8c^3 - 20258796646144c^4 - \\
& -3653166613056ac^4 + 56989635136a^2c^4 + 13326094544a^3c^4 - 308739200a^4c^4 \\
& - 5484640a^5c^4 + 159040a^6c^4 - 560a^7c^4 + \\
& +2762273996800c^5 + 313271863296ac^5 - 11408255488a^2c^5 - 603912960a^3c^5 \\
& + 19523840a^4c^5 - 5376a^5c^5 - 1792a^6c^5 - \\
& -255403395072c^6 - 16677258752ac^6 + 860412672a^2c^6 + 11699968a^3c^6 - 510720a^4c^6 \\
& + 1792a^5c^6 + 16110796800c^7 + \\
& +517641216ac^7 - 33470976a^2c^7 + 9216a^3c^7 + 4608a^4c^7 - 682830336c^8 - 7521024ac^8 \\
& + 658944a^2c^8 - 2304a^3c^8 + \\
& +18595840c^9 - 5120ac^9 - 5120a^2c^9 - 293888c^{10} + 1024ac^{10} \\
& + 2048c^{11}] \quad (26)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, & 25-a ; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-25} \{\prod_{\rho=1}^{24} (\rho-a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-24}{2})} (1295295050649600 + 1953217026028800a \right. \\
& \quad \left. + 720182075218848a^2 + \right. \\
& \quad \left. + 56242392874200a^3 - 6430140382484a^4 - 384225527550a^5 + 34503650159a^6 \right. \\
& \quad \left. + 18877950a^7 - 48737217a^8 + \right. \\
& \quad \left. + 1122750a^9 - 2107a^{10} - 150a^{11} + a^{12} - 2824623532523520c - 2750688728985600ac \right. \\
& \quad \left. - 650557782840576a^2c - \right. \\
& \quad \left. - 14031184440000a^3c + 5306549788800a^4c + 16204297200a^5c - 15185557296a^6c \right. \\
& \quad \left. + 337740000a^7c + 5397600a^8c - \right. \\
& \quad \left. - 234000a^9c + 1872a^{10}c + 2298271622344704c^2 + 1532660626368000ac^2 \right. \\
& \quad \left. + 226240061985280a^2c^2 - \right.
\end{aligned}$$

$$\begin{aligned}
& -5059473463200a^3c^2 - 1376735080736a^4c^2 + 36195503400a^5c^2 + 1749343288a^6c^2 \\
& - 69774000a^7c^2 + 360240a^8c^2 + \\
& + 9000a^9c^2 - 72a^{10}c^2 - 988040333070336c^3 - 458238106560000ac^3 \\
& - 39008403657600a^2c^3 + 2443984233600a^3c^3 + \\
& + 148362815328a^4c^3 - 7556640000a^5c^3 - 26644800a^6c^3 + 4368000a^7c^3 - 43680a^8c^3 \\
& + 258663765079040c^4 + \\
& + 82943231664000ac^4 + 3361869113440a^2c^4 - 398515370400a^3c^4 - 5286817592a^4c^4 \\
& + 599592000a^5c^4 - 5544560a^6c^4 - \\
& - 84000a^7c^4 + 840a^8c^4 - 44346659635200c^5 - 9621229363200ac^5 - 85147625472a^2c^5 \\
& + 33231744000a^3c^5 - \\
& - 227834880a^4c^5 - 20966400a^5c^5 + 279552a^6c^5 + 5176704237568c^6 \\
& + 731346739200ac^6 - 9600109568a^2c^6 - \\
& - 1516300800a^3c^6 + 24726016a^4c^6 + 268800a^5c^6 - 3584a^6c^6 - 418737586176c^7 \\
& - 36241920000ac^7 + 1000396800a^2c^7 + \\
& + 35942400a^3c^7 - 718848a^4c^7 + 23472279552c^8 + 1127232000ac^8 - 40769280a^2c^8 \\
& - 345600a^3c^8 + 6912a^4c^8 - \\
& - 894566400c^9 - 19968000ac^9 + 798720a^2c^9 + 22110208c^{10} + 153600ac^{10} - 6144a^2c^{10} \\
& - 319488c^{11} + 2048c^{12}) + \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-25}{2})} (642905026283520 + 536430721132800a + 114941722154688a^2 \\
& + 1925655420000a^3 - \\
& - 909114008400a^4 - 1437781800a^5 + 2535320424a^6 - 57018000a^7 - 892320a^8 \\
& + 39000a^9 - 312a^{10} - \\
& - 943741088299008c - 566915213203200ac - 77644945591872a^2c \\
& + 1953684829600a^3c + 462411503408a^4c - \\
& - 12465164600a^5c - 579414472a^6c + 23314000a^7c - 120640a^8c - 3000a^9c + 24a^{10}c \\
& + 569402217805824c^2 + \\
& + 245281402080000ac^2 + 19642608356800a^2c^2 - 1277504155200a^3c^2 \\
& - 73799166896a^4c^2 + 3813264000a^5c^2 + \\
& + 12856480a^6c^2 - 2184000a^7c^2 + 21840a^8c^2 - 189917707732992c^3 \\
& - 57743834144000ac^3 - 2208865074240a^2c^3 + \\
& + 270734475200a^3c^3 + 3442060496a^4c^3 - 400624000a^5c^3 + 3708320a^6c^3 + 56000a^7c^3 \\
& - 560a^8c^3 + 39416989081600c^4 +
\end{aligned}$$

$$\begin{aligned}
& +8229521664000ac^4 + 65103933440a^2c^4 - 27902784000a^3c^4 + 194055680a^4c^4 \\
& + 17472000a^5c^4 - 232960a^6c^4 - \\
& -5396707745792c^5 - 741874022400ac^5 + 9980880896a^2c^5 + 1519526400a^3c^5 \\
& - 24790528a^4c^5 - 268800a^5c^5 + \\
& +3584a^6c^5 + 501075714048c^6 + 42561792000ac^6 - 1178311680a^2c^6 - 41932800a^3c^6 \\
& + 838656a^4c^6 - 31738847232c^7 - \\
& -1506048000ac^7 + 54481920a^2c^7 + 460800a^3c^7 - 9216a^4c^7 + 1350635520c^8 \\
& + 29952000ac^8 - 1198080a^2c^8 - \\
& -36925440c^9 - 256000ac^9 + 10240a^2c^9 + 585728c^{10} \\
& - 4096c^{11}] \quad (27)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, & 26-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-26} \{\prod_{\tau=1}^{25} (\tau - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-26}{2})} (-2490952020480000 - 3856567328006400a \right. \\
& \quad \left. - 1535121422480160a^2 - \right. \\
& \quad -162685541616312a^3 + 7957280277044a^4 + 1100869544310a^5 - 43694979215a^6 \\
& \quad \left. - 1539415206a^7 + 90397857a^8 - \right. \\
& \quad -769110a^9 - 18725a^{10} + 318a^{11} - a^{12} + 5440375458201600c + 5512278582766080ac \\
& \quad \left. + 1453485267708864a^2c + \right. \\
& \quad +72388041958576a^3c - 9060718762800a^4c - 307607766540a^5c + 27726305208a^6c \\
& \quad \left. - 96424644a^7c - 19614240a^8c + \right. \\
& \quad +339500a^9c - 552a^{10}c - 12a^{11}c - 4437289667266560c^2 - 3123375119467776ac^2 \\
& \quad \left. - 539380387024256a^2c^2 - \right. \\
& \quad -4354450180400a^3c^2 + 2864279730800a^4c^2 - 8089061876a^5c^2 - 4607346604a^6c^2 \\
& \quad \left. + 84726040a^7c^2 + 721000a^8c^2 - \right. \\
& \quad -22260a^9c^2 + 84a^{10}c^2 + 1913345384014848c^3 + 952103060350336ac^3 \\
& \quad \left. + 102944105640800a^2c^3 - \right. \\
& \quad -2607695699200a^3c^3 - 390111231160a^4c^3 + 9154149592a^5c^3 + 261055760a^6c^3 \\
& \quad \left. - 7910000a^7c^3 + 27720a^8c^3 + \right. \\
& \quad +280a^9c^3 - 502609149259776c^4 - 176315887270400ac^4 - 10847680617600a^2c^4 \\
& \quad \left. + 618019552640a^3c^4 + \right.
\end{aligned}$$

$$\begin{aligned}
& +24394548640a^4c^4 - 1011055360a^5c^4 - 1400000a^6c^4 + 237440a^7c^4 - 1120a^8c^4 \\
& + 86485139701760c^5 + \\
& +21027657410560ac^5 + 589073089024a^2c^5 - 61326539008a^3c^5 - 482101760a^4c^5 \\
& + 45516800a^5c^5 - 272384a^6c^5 - \\
& -1792a^7c^5 - 10133908029440c^6 - 1655765594112ac^6 - 7453361664a^2c^6 \\
& + 3226325760a^3c^6 - 17606400a^4c^6 - \\
& -854784a^5c^6 + 5376a^6c^6 + 822856065024c^7 + 86073947136ac^7 - 952220160a^2c^7 \\
& - 90969600a^3c^7 + 944640a^4c^7 + \\
& +4608a^5c^7 - 46299721728c^8 - 2875799040ac^8 + 57504000a^2c^8 + 1221120a^3c^8 \\
& - 11520a^4c^8 + 1771069440c^9 + \\
& +57728000ac^9 - 1320960a^2c^9 - 5120a^3c^9 - 43929600c^{10} - 596992ac^{10} + 11264a^2c^{10} \\
& + 636928c^{11} \\
& +2048ac^{11} - 4096c^{12}) + \frac{1}{\Gamma(\frac{c-a}{2})\Gamma(\frac{c+a-25}{2})} (16072626136089600 + 13440284546567040a \\
& + 2865451725805248a^2 + \\
& +29899479296856a^3 - 26048131417484a^4 + 79808986650a^5 + 85137424259a^6 \\
& - 2401982262a^7 - 36821217a^8 + \\
& +2318910a^9 - 27607a^{10} + 6a^{11} + a^{12} - 24265950238448640c - 14741496935911296ac \\
& - 2017268942695968a^2c + \\
& +68446835425936a^3c + 14014027182600a^4c - 473895443004a^5c - 21308046816a^6c \\
& + 1112026236a^7c - \\
& -8236440a^8c - 250180a^9c + 3984a^{10}c - 12a^{11}c + 15219075677764608c^2 \\
& + 6700424924066688ac^2 + \\
& +535657463741216a^2c^2 - 42544045416400a^3c^2 - 2402722747640a^4c^2 \\
& + 155381269148a^5c^2 + 343370524a^6c^2 - \\
& -129859240a^7c^2 + 1932560a^8c^2 - 420a^9c^2 - 84a^{10}c^2 - 5339375497061376c^3 \\
& - 1680535240613504ac^3 - \\
& -62742622448800a^2c^3 + 9664699301120a^3c^3 + 112990802120a^4c^3 - 19005822248a^5c^3 \\
& + 240492560a^6c^3 + \\
& +4669840a^7c^3 - 93240a^8c^3 + 280a^9c^3 + 1181843678785536c^4 + 259516705395200ac^4 \\
& + 1441658770560a^2c^4 - \\
& -1119356174720a^3c^4 + 11001976160a^4c^4 + 1038876160a^5c^4 - 20614720a^6c^4 \\
& + 4480a^7c^4 + 1120a^8c^4 -
\end{aligned}$$

$$\begin{aligned}
& -175498953625600c^5 - 25896839035904ac^5 + 463983127552a^2c^5 + 71818487552a^3c^5 \\
& \quad - 1570741760a^4c^5 - \\
& -22414336a^5c^5 + 598528a^6c^5 - 1792a^7c^5 + 18057365540864c^6 + 1692014693376ac^6 \\
& \quad - 59402198016a^2c^6 - \\
& -2493308160a^3c^6 + 74215680a^4c^6 - 16128a^5c^6 - 5376a^6c^6 - 1304623362048c^7 \\
& \quad - 70987152384ac^7 + \\
& +3406487040a^2c^7 + 38423040a^3c^7 - 1543680a^4c^7 + 4608a^5c^7 + 65999751168c^8 \\
& \quad + 1780938240ac^8 - \\
& -106026240a^2c^8 + 23040a^3c^8 + 11520a^4c^8 - 2289039360c^9 - 21345280ac^9 \\
& \quad + 1720320a^2c^9 - 5120a^3c^9 + 51836928c^{10} - \\
& \quad -11264ac^{10} - 11264a^2c^{10} - 690176c^{11} + 2048ac^{11} \\
& \quad + 4096c^{12})] \tag{28} \\
& {}_2F_1 \left[\begin{matrix} a, & 27-a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-27} \left\{ \prod_{\omega=1}^{26} (\omega-a) \right\}} \left[\frac{1}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a-26}{2}\right)} (-64764752532480000 \right. \\
& \quad \left. - 100380043171699200a - \right. \\
& \quad -39961833294277440a^2 - 4123736953919856a^3 + 256023569984728a^4 \\
& \quad \left. + 31801134144780a^5 - \right. \\
& \quad -1558156952170a^6 - 50373915228a^7 + 3827623254a^8 - 43587180a^9 - 1136590a^{10} \\
& \quad \left. + 29484a^{11} - 182a^{12} + \right. \\
& \quad +144050006577254400c + 147452461905565440ac + 39195512438330976a^2c \\
& \quad \left. + 1832112082132488a^3c - \right. \\
& \quad -287018424824820a^4c - 8938296035370a^5c + 1036785419267a^6c - 6318393822a^7c \\
& \quad \left. - 961728573a^8c + \right. \\
& \quad +22376250a^9c - 61503a^{10}c - 2106a^{11}c + 13a^{12}c - 121037881922979840c^2 \\
& \quad \left. - 86868374537887488ac^2 - \right. \\
& \quad -15242604318923072a^2c^2 - 55558110535200a^3c^2 + 95763174889200a^4c^2 \\
& \quad \left. - 590522711688a^5c^2 - \right. \\
& \quad -191785682088a^6c^2 + 4514393520a^7c^2 + 41787200a^8c^2 - 2063880a^9c^2 + 15288a^{10}c^2 \\
& \quad \left. + 54356751317087232c^3 + \right.
\end{aligned}$$

$$\begin{aligned}
& +27874136758186368ac^3 + 3085125461785120a^2c^3 - 100181778231600a^3c^3 \\
& - 14205835897240a^4c^3 + \\
& +417933311796a^5c^3 + 12524891652a^6c^3 - 518427000a^7c^3 + 2810080a^8c^3 + 49140a^9c^3 \\
& - 364a^{10}c^3 - \\
& -15048508078170112c^4 - 5510896488115200ac^4 - 348584266284800a^2c^4 \\
& + 24233385496320a^3c^4 + \\
& +989824006080a^4c^4 - 52703239680a^5c^4 - 42806400a^6c^4 + 22014720a^7c^4 \\
& - 203840a^8c^4 + 2766863106748416c^5 + \\
& +713725312135680ac^5 + 20286412405376a^2c^5 - 2682886437504a^3c^5 \\
& - 20797594272a^4c^5 + 2971987200a^5c^5 - \\
& -26784576a^6c^5 - 314496a^7c^5 + 2912a^8c^5 - 352289946910720c^6 \\
& - 62361643309056ac^6 - 195338078208a^2c^6 + \\
& +166299194880a^3c^6 - 1296422400a^4c^6 - 79252992a^5c^6 + 978432a^6c^6 \\
& + 31756854910976c^7 + 3702483053568ac^7 - \\
& -54505331712a^2c^7 - 5923756800a^3c^7 + 91503360a^4c^7 + 808704a^5c^7 - 9984a^6c^7 \\
& - 2041738223616c^8 - \\
& -147221867520ac^8 + 3924211200a^2c^8 + 113218560a^3c^8 - 2096640a^4c^8 \\
& + 93007269888c^9 + 3751488000ac^9 - \\
& -126813440a^2c^9 - 898560a^3c^9 + 16640a^4c^9 - 2931568640c^{10} - 55351296ac^{10} \\
& + 2050048a^2c^{10} + 60782592c^{11} + \\
& +359424ac^{11} - 13312a^2c^{11} - 745472c^{12} + 4096c^{13}) \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-27}{2})} (-30954687834470400 - 27083696955505920a - \\
& -6507826104671232a^2 - 266037152739696a^3 + 46345379507128a^4 \\
& + 1310367681180a^5 - 161428233286a^6 + \\
& +1051866972a^7 + 147525474a^8 - 3450060a^9 + 9518a^{10} + 324a^{11} - 2a^{12} \\
& + 46830753703157760c + \\
& +30177797417929728ac + 4904720971886848a^2c + 2028304333440a^3c \\
& - 30073515460800a^4c + 214205215392a^5c + \\
& +59036418336a^6c - 1402591680a^7c - 12732160a^8c + 635040a^9c - 4704a^{10}c \\
& - 29447558550300672c^2 - \\
& -13975007786673408ac^2 - 1454937127911872a^2c^2 + 50384404663200a^3c^2 \\
& + 6588240225360a^4c^2 -
\end{aligned}$$

$$\begin{aligned}
& -197467198488a^5c^2 - 5739479928a^6c^2 + 239757840a^7c^2 - 1301440a^8c^2 - 22680a^9c^2 \\
& + 168a^{10}c^2 + \\
& +10362233929793536c^3 + 3584472290058240ac^3 + 215080588441600a^2c^3 \\
& - 15425517864960a^3c^3 - \\
& -605115409920a^4c^3 + 32676618240a^5c^3 + 23331840a^6c^3 - 13547520a^7c^3 \\
& + 125440a^8c^3 - 2301160681971712c^4 - \\
& -569028657484800ac^4 - 15308983466240a^2c^4 + 2095673368320a^3c^4 \\
& + 15505116480a^4c^4 - 2290498560a^5c^4 + \\
& +20657280a^6c^4 + 241920a^7c^4 - 2240a^8c^4 + 342894825799680c^5 \\
& + 58835112763392ac^5 + 146424004608a^2c^5 - \\
& -154482370560a^3c^5 + 1214760960a^4c^5 + 73156608a^5c^5 - 903168a^6c^5 \\
& - 35405951328256c^6 - 4035795757056ac^6 + \\
& +60337815552a^2c^6 + 6391042560a^3c^6 - 98757120a^4c^6 - 870912a^5c^6 + 10752a^6c^6 \\
& + 2567120683008c^7 + \\
& +182218014720ac^7 - 4867645440a^2c^7 - 139345920a^3c^7 + 2580480a^4c^7 \\
& - 130323050496c^8 - 5203491840ac^8 + \\
& +175925760a^2c^8 + 1244160a^3c^8 - 23040a^4c^8 + 4535336960c^9 + 85155840ac^9 \\
& - 3153920a^2c^9 - 103043072c^{10} - \\
& -608256ac^{10} + 22528a^2c^{10} + 1376256c^{11} - 8192c^{12})] \quad (29)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 28-a; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-28} \{\prod_{q=1}^{27} (q-a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-28}{2})} (124903451312640000 \right. \\
& \quad \left. + 198245272713580800a + \right. \\
& \quad \left. +84237341463908640a^2 + 10772713785416184a^3 - 197837366197044a^4 \right. \\
& \quad \left. - 74046181005314a^5 + 1239432836775a^6 + \right. \\
& \quad \left. +162122858357a^7 - 5261040477a^8 - 33773187a^9 + 3183285a^{10} - 36841a^{11} + 21a^{12} \right. \\
& \quad \left. + a^{13} - 278170295082854400c - \right. \\
& \quad \left. -294899108770863360ac - 85743719979624576a^2c - 6115709513194896a^3c \right. \\
& \quad \left. + 428497731401864a^4c + \right. \\
& \quad \left. +31572110867940a^5c - 1543488682402a^6c - 26614826532a^7c + 2007873630a^8c \right. \\
& \quad \left. - 19898340a^9c - 268982a^{10}c + \right.
\end{aligned}$$

$$\begin{aligned}
& +4788a^{11}c - 14a^{12}c + 234198965910666240c^2 + 176184125195674752ac^2 \\
& + 34997280444483552a^2c^2 + \\
& +1019255391215056a^3c^2 - 178004305027800a^4c^2 - 3137600392428a^5c^2 \\
& + 384865270776a^6c^2 - 2779008876a^7c^2 - \\
& -186739560a^8c^2 + 3261020a^9c^2 - 6552a^{10}c^2 - 84a^{11}c^2 - 105436987989000192c^3 \\
& - 57440774292713472ac^3 - \\
& -7587729681637376a^2c^3 + 30167244537600a^3c^3 + 31516664669440a^4c^3 \\
& - 267758688960a^5c^3 - 36622587456a^6c^3 + \\
& +700882560a^7c^3 + 3534720a^8c^3 - 127680a^9c^3 + 448a^{10}c^3 + 29272395221864448c^4 \\
& + 11567453274584576ac^4 + \\
& +959504446627200a^2c^4 - 30984268494080a^3c^4 - 2804671306080a^4c^4 \\
& + 71402698080a^5c^4 + 1330539840a^6c^4 - \\
& -42060480a^7c^4 + 151200a^8c^4 + 1120a^9c^4 - 5398575951060992c^5 \\
& - 1531129739443200ac^5 - 71188221133056a^2c^5 + \\
& +4429295426304a^3c^5 + 121707496512a^4c^5 - 5277242880a^5c^5 + 744576a^6c^5 \\
& + 919296a^7c^5 - 4032a^8c^5 + \\
& +689572103331840c^6 + 137397211710464ac^6 + 2713645670400a^2c^6 \\
& - 317715584256a^3c^6 - 1414103040a^4c^6 + \\
& +177612288a^5c^6 - 1032192a^6c^6 - 5376a^7c^6 - 62363802566656c^7 \\
& - 8441027076096ac^7 - 5987837952a^2c^7 + \\
& +12894704640a^3c^7 - 76968960a^4c^7 - 2626560a^5c^7 + 15360a^6c^7 + 4022644322304c^8 \\
& + 351717355008ac^8 - \\
& -4223888640a^2c^8 - 291152640a^3c^8 + 2868480a^4c^8 + 11520a^5c^8 - 183833481216c^9 \\
& - 9617372160ac^9 + \\
& +185546240a^2c^9 + 3210240a^3c^9 - 28160a^4c^9 + 5812561920c^{10} + 160635904ac^{10} \\
& - 3446784a^2c^{10} - 11264a^3c^{10} \\
& -120881152c^{11} - 1400832ac^{11} + 24576a^2c^{11} + 1486848c^{12} + 4096ac^{12} - 8192c^{13}) + \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-27}{2})} (-835776577757721600 - 732560266788865920a \\
& - 175421799959309568a^2 - \\
& -6354743845373448a^3 + 1435874126626940a^4 + 34847676651046a^5 \\
& - 5714447085179a^6 + 56439882581a^7 +
\end{aligned}$$

$$\begin{aligned}
& +6367545345a^8 - 190140027a^9 + 798847a^{10} + 31367a^{11} - 385a^{12} + a^{13} \\
& + 1296685506612695040c + \\
& +843440768583257088ac + 137263732473974976a^2c - 759650829872528a^3c \\
& - 970433188681304a^4c + \\
& +11103150302292a^5c + 2258084186290a^6c - 66672519396a^7c - 586759950a^8c \\
& + 43633100a^9c - 481306a^{10}c + 84a^{11}c + \\
& +14a^{12}c - 843760907368455168c^2 - 407726081879932800ac^2 \\
& - 42627997732439328a^2c^2 + 1851674567870416a^3c^2 + \\
& +226586093902440a^4c^2 - 8357231234028a^5c^2 - 240471792456a^6c^2 \\
& + 13132553364a^7c^2 - 99628200a^8c^2 - \\
& -2195620a^9c^2 + 32424a^{10}c^2 - 84a^{11}c^2 + 310294269783343104c^3 \\
& + 110429360845348864ac^3 + \\
& +6630455726683136a^2c^3 - 576173662357760a^3c^3 - 22396834908160a^4c^3 \\
& + 1518843466560a^5c^3 - 733569984a^6c^3 - \\
& -930840960a^7c^3 + 12835200a^8c^3 - 2240a^9c^3 - 448a^{10}c^3 - 72831305901223936c^4 \\
& - 18763381574731264ac^4 - \\
& -488099338700160a^2c^4 + 85064353434880a^3c^4 + 542806813920a^4c^4 \\
& - 124938122400a^5c^4 + 1528927680a^6c^4 + \\
& +23419200a^7c^4 - 433440a^8c^4 + 1120a^9c^4 + 11625428332593152c^5 \\
& + 2111137037294592ac^5 + \\
& +364443241728a^2c^5 - 7095335831808a^3c^5 + 75517299648a^4c^5 + 5026549248a^5c^5 \\
& - 92416128a^6c^5 + 16128a^7c^5 + \\
& +4032a^8c^5 - 1307344350531584c^6 - 160943873108992ac^6 + 3096581440512a^2c^6 \\
& + 347557964544a^3c^6 - \\
& -7182551040a^4c^6 - 84306432a^5c^6 + 2085888a^6c^6 - 5376a^7c^6 + 105454131576832c^7 \\
& + 8307462070272ac^7 - \\
& -280139655168a^2c^7 - 9574394880a^3c^7 + 264053760a^4c^7 - 46080a^5c^7 - 15360a^6c^7 \\
& - 6129210697728c^8 - \\
& -282331740672ac^8 + 12658510080a^2c^8 + 120433920a^3c^8 - 4481280a^4c^8 + 11520a^5c^8 \\
& + 254489174016c^9 + \\
& +5851028480ac^9 - 322741760a^2c^9 + 56320a^3c^9 + 28160a^4c^9 - 7360821248c^{10} \\
& - 58876928ac^{10} + 4392960a^2c^{10}
\end{aligned}$$

$$\begin{aligned}
& -11264a^3c^{10} + 140836864c^{11} - 24576ac^{11} - 24576a^2c^{11} \\
& - 1601536c^{12} + 4096ac^{12} + 8192c^{13})] \\
& {}_2F_1 \left[\begin{matrix} a, & 29-a; \\ c & ; & \frac{1}{2} \end{matrix} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-29} \{\prod_{\varphi=1}^{28} (\varphi - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-28}{2})} (3497296636753920000 \right. \\
& \quad + 5555901589554355200a + \\
& \quad + 2361133612996790400a^2 + 296837573062012416a^3 - 8045509822184520a^4 \\
& \quad - 2309495184101812a^5 \\
& \quad + 52230988296494a^6 + 5767788455233a^7 - 229366815305a^8 - 1161910491a^9 \\
& \quad + 180370407a^{10} - 2797949a^{11} + \\
& \quad + 3325a^{12} + 203a^{13} - a^{14} - 7918705667206656000c - 8468671081133975040ac \\
& \quad - 2479748097907906560a^2c - \\
& \quad - 171617279580731040a^3c + 14728842045867600a^4c + 1017261537926760a^5c \\
& \quad - 60706566010020a^6c - \\
& \quad - 943838942760a^7c + 96558281820a^8c - 1243943400a^9c - 18619020a^{10}c + 511560a^{11}c \\
& \quad - 2940a^{12}c + \\
& \quad + 6846504051410380800c^2 + 5236025170478554368ac^2 + 1054763431379223552a^2c^2 \\
& \quad + 27669690834216368a^3c^2 - \\
& \quad - 6282770101240920a^4c^2 - 97054310426892a^5c^2 + 16257739742734a^6c^2 \\
& \quad - 161294509908a^7c^2 - 10458065394a^8c^2 + \\
& \quad + 246088780a^9c^2 - 790566a^{10}c^2 - 17052a^{11}c^2 + 98a^{12}c^2 - 3194920175887319040c^3 \\
& \quad - 1785014716346695680ac^3 - \\
& \quad - 240816902070528000a^2c^3 + 2045465086963200a^3c^3 + 1188161185612800a^4c^3 \\
& \quad - 14134893897600a^5c^3 - \\
& \quad - 1735016492160a^6c^3 + 42316243200a^7c^3 + 228614400a^8c^3 - 13641600a^9c^3 \\
& \quad + 94080a^{10}c^3 + 928567869196713984c^4 + \\
& \quad + 380255719502460928ac^4 + 32418584463820800a^2c^4 - 1288125293230720a^3c^4 \\
& \quad - 115836728362880a^4c^4 + \\
& \quad + 3658531836960a^5c^4 + 72650029536a^6c^4 - 3160758720a^7c^4 + 17357760a^8c^4 \\
& \quad + 227360a^9c^4 - 1568a^{10}c^4 - \\
& \quad - 181307281284218880c^5 - 53972606059223040ac^5 - 2584272171962880a^2c^5 \\
& \quad + 195478551313920a^3c^5 +
\end{aligned}
\tag{30}$$

$$\begin{aligned}
& +5608442125440a^4c^5 - 313713146880a^5c^5 + 282804480a^6c^5 + 98219520a^7c^5 \\
& - 846720a^8c^5 + 24848775724408832c^6 + \\
& +5280766105517056ac^6 + 104851642776832a^2c^6 - 15801579295488a^3c^6 \\
& - 64686839616a^4c^6 + 13307653632a^5c^6 - \\
& -116038272a^6c^6 - 1091328a^7c^6 + 9408a^8c^6 - 2451416728535040c^7 \\
& - 361346358804480ac^7 + 301765201920a^2c^7 + \\
& +759844915200a^3c^7 - 6318950400a^4c^7 - 280627200a^5c^7 + 3225600a^6c^7 \\
& + 176187932065792c^8 + \\
& +17257259464704ac^8 - 269957270016a^2c^8 - 21766536960a^3c^8 + 318769920a^4c^8 \\
& + 2338560a^5c^8 - 26880a^6c^8 - \\
& -9232454246400c^9 - 563530598400ac^9 + 14458752000a^2c^9 + 342988800a^3c^9 \\
& - 5913600a^4c^9 + 348808728576c^{10} + \\
& +11988601856ac^{10} - 380244480a^2c^{10} - 2286592a^3c^{10} + 39424a^4c^{10} - 9248440320c^{11} \\
& - 149667840ac^{11} \\
& +5160960a^2c^{11} + 163201024c^{12} + 831488ac^{12} - 28672a^2c^{12} - 1720320c^{13} + 8192c^{14}) + \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-29}{2})} (1613913397544448000 + 1472574330511280640a \\
& + 389021279417326080a^2 + \\
& +24196510822078560a^3 - 2274657906963120a^4 - 143258950036440a^5 \\
& + 8920185210300a^6 + 128774925720a^7 - \\
& -13826578500a^8 + 179655000a^9 + 2646420a^{10} - 73080a^{11} + 420a^{12} \\
& - 2508255032493772800c - \\
& -1717842284795966976ac - 319975449572777472a^2c - 7155985266367904a^3c \\
& + 1861324669488208a^4c + \\
& +25627804125096a^5c - 4686483308420a^6c + 47891228952a^7c + 2978091900a^8c \\
& - 70441000a^9c + 226772a^{10}c + \\
& +4872a^{11}c - 28a^{12}c + 1635663709850664960c^2 + 843196968357212160ac^2 \\
& + 106898081437578240a^2c^2 - \\
& -1158164266406400a^3c^2 - 517205009606400a^4c^2 + 6506815190400a^5c^2 \\
& + 743164813440a^6c^2 - 18275846400a^7c^2 - \\
& -96768000a^8c^2 + 5846400a^9c^2 - 40320a^{10}c^2 - 603022201203621888c^3 \\
& - 232515149352194048ac^3 -
\end{aligned}$$

$$\begin{aligned}
& -18822315352579072a^2c^3 + 781393137041920a^3c^3 + 66374684913920a^4c^3 \\
& \quad - 2128630197120a^5c^3 - \\
& -41182549632a^6c^3 + 1809265920a^7c^3 - 9945600a^8c^3 - 129920a^9c^3 + 896a^{10}c^3 \\
& \quad + 141928904910028800c^4 + \\
& +40368743871436800ac^4 + 1844139367411200a^2c^4 - 143432935027200a^3c^4 \\
& \quad - 3974328892800a^4c^4 + \\
& +225483955200a^5c^4 - 218131200a^6c^4 - 70156800a^7c^4 + 604800a^8c^4 \\
& \quad - 22721029659049984c^5 - \\
& -4664860707047424ac^5 - 87699486460416a^2c^5 + 13718425437696a^3c^5 \\
& \quad + 52894283904a^4c^5 - 11425268736a^5c^5 + \\
& +99676416a^6c^5 + 935424a^7c^5 - 8064a^8c^5 + 2562816998277120c^6 \\
& \quad + 368118604062720ac^6 - 475610849280a^2c^6 - \\
& -763960780800a^3c^6 + 6389913600a^4c^6 + 280627200a^5c^6 - 3225600a^6c^6 \\
& \quad - 207355683897344c^7 - 19928195211264ac^7 + \\
& +315044315136a^2c^7 + 24915240960a^3c^7 - 364984320a^4c^7 - 2672640a^5c^7 + 30720a^6c^7 \\
& \quad + 12088613560320c^8 + \\
& +728067225600ac^8 - 18711475200a^2c^8 - 440985600a^3c^8 + 7603200a^4c^8 \\
& \quad - 503429701632c^9 - 17152706560ac^9 + \\
& +544107520a^2c^9 + 3266560a^3c^9 - 56320a^4c^9 + 14603550720c^{10} + 235192320ac^{10} \\
& \quad - 8110080a^2c^{10} - 280199168c^{11} - \\
& -1425408ac^{11} + 49152a^2c^{11} + 3194880c^{12} - 16384c^{13}] \quad (31)
\end{aligned}$$

$${}_2F_1 \left[\begin{matrix} a, & 30-a ; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-30} \{\prod_{\kappa=1}^{29} (\kappa-a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-30}{2})} (-6761440164390912000 \right. \\
& \quad \left. - 10975820682116828160a - \right. \\
& -4935233255279884416a^2 - 729789149421755136a^3 - 4220197814149688a^4 \\
& \quad + 4751293608022388a^5 + \\
& +20580722419698a^6 - 12993499610273a^7 + 207448509161a^8 + 9479314299a^9 \\
& \quad - 309595783a^{10} + 1647709a^{11} + \\
& +35427a^{12} - 427a^{13} + a^{14} + 15326298997068810240c + 16912364017713907968ac \\
& \quad \left. + 5341563944575762176a^2c + \right.
\end{aligned}$$

$$\begin{aligned}
& +486193174327051888a^3c - 17721927335789288a^4c - 2655392142674852a^5c \\
& + 68415639214898a^6c + \\
& +4076609731294a^7c - 151651399494a^8c - 156424450a^9c + 60914966a^{10}c \\
& - 708022a^{11}c + 742a^{12}c + 14a^{13}c - \\
& -13273287874275557376c^2 - 10581609146505394176ac^2 \\
& - 2359216299514810368a^2c^2 - 113984108675034240a^3c^2 + \\
& +10464620334250304a^4c^2 + 462806131944480a^5c^2 - 27019467604880a^6c^2 \\
& - 213739449504a^7c^2 + 24126311664a^8c^2 - \\
& -258857760a^9c^2 - 2150960a^{10}c^2 + 40992a^{11}c^2 - 112a^{12}c^2 + 6206845674605838336c^3 \\
& + 3655758996318896128ac^3 + \\
& +566360717498711040a^2c^3 + 8471349113362176a^3c^3 - 2354033956865280a^4c^3 \\
& - 18437749885120a^5c^3 + \\
& +3762081665664a^6c^3 - 35808999744a^7c^3 - 1303626240a^8c^3 + 23047360a^9c^3 \\
& - 51072a^{10}c^3 - 448a^{11}c^3 - \\
& -1808232623781232640c^4 - 790682156498434048ac^4 - 82059994215443456a^2c^4 \\
& + 1023013859383680a^3c^4 + \\
& +271425411296640a^4c^4 - 3312431939040a^5c^4 - 235347504672a^6c^4 + 4630785600a^7c^4 \\
& + 13513920a^8c^4 - \\
& -614880a^9c^4 + 2016a^{10}c^4 + 353978861595516928c^5 + 114221183100068864ac^5 \\
& + 7421904568692480a^2c^5 - \\
& -278541991695360a^3c^5 - 17101748153280a^4c^5 + 460523722176a^5c^5 \\
& + 5856950400a^6c^5 - 195941760a^7c^5 + \\
& +705600a^8c^5 + 4032a^9c^5 - 48646217148710912c^6 - 11412178770864128ac^6 \\
& - 406527582805504a^2c^6 + \\
& +27328469113344a^3c^6 + 538828983168a^4c^6 - 24621112320a^5c^6 + 27928320a^6c^6 \\
& + 3279360a^7c^6 - 13440a^8c^6 + \\
& +4812572103507968c^7 + 801309941284864ac^7 + 11028903438336a^2c^7 \\
& - 1492276712448a^3c^7 - 3166279680a^4c^7 + \\
& +645550080a^5c^7 - 3624960a^6c^7 - 15360a^7c^7 - 346867926056960c^8 \\
& - 39565589673984ac^8 + 77974516224a^2c^8 + \\
& +48272843520a^3c^8 - 301551360a^4c^8 - 7729920a^5c^8 + 42240a^6c^8 + 18227487657984c^9 \\
& + 1352747703296ac^9 -
\end{aligned}$$

$$\begin{aligned}
& -16971947520a^2c^9 - 893770240a^3c^9 + 8363520a^4c^9 + 28160a^5c^9 - 690554748928c^{10} \\
& \quad - 30856196096ac^{10} + \\
& +573089792a^2c^{10} + 8245248a^3c^{10} - 67584a^4c^{10} + 18358992896c^{11} + 435724288ac^{11} \\
& \quad - 8798208a^2c^{11} - \\
& -24576a^3c^{11} - 324812800c^{12} - 3248128ac^{12} + 53248a^2c^{12} + 3432448c^{13} + 8192ac^{13} \\
& \quad - 16384c^{14}) + \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-29}{2})} (46803488615967283200 + 42767159087365735680a \\
& \quad + 11270601192070601856a^2 + \\
& + 661015913631944304a^3 - 76584910384046512a^4 - 4417245600019672a^5 \\
& \quad + 336434811648432a^6 + \\
& + 3976287855967a^7 - 608379703391a^8 + 9950104899a^9 + 147972013a^{10} - 5745971a^{11} \\
& \quad + 49203a^{12} - 7a^{13} - a^{14} - \\
& -74415813125868103680c - 51370802672923567872ac - 9590167310349136896a^2c \\
& \quad - 174040376046710672a^3c + \\
& + 63985787842864088a^4c + 678065157135388a^5c - 186286806337838a^6c \\
& \quad + 2516062112734a^7c + 145725587994a^8c - \\
& -4413443650a^9c + 20549494a^{10}c + 541898a^{11}c - 6202a^{12}c + 14a^{13}c \\
& \quad + 50034321004680953856c^2 + \\
& + 26188677313214367744ac^2 + 3340987169121850368a^2c^2 - 55647356127077760a^3c^2 \\
& \quad - 18708842259562304a^4c^2 + \\
& + 314035097808480a^5c^2 + 32131358547920a^6c^2 - 977872074144a^7c^2 \\
& \quad - 4833796464a^8c^2 + 459678240a^9c^2 - \\
& -4723600a^{10}c^2 + 672a^{11}c^2 + 112a^{12}c^2 - 19178889908274610176c^3 \\
& \quad - 7572855930087606272ac^3 - \\
& -617930250420794880a^2c^3 + 31207762807608576a^3c^3 + 2572172951249280a^4c^3 \\
& \quad - 100552461707200a^5c^3 - \\
& -1945358951424a^6c^3 + 112831486656a^7c^3 - 854904960a^8c^3 - 14450240a^9c^3 \\
& \quad + 198912a^{10}c^3 - 448a^{11}c^3 + \\
& + 4737652999555604480c^4 + 1394083224658414592ac^4 + 63770234054656256a^2c^4 \\
& \quad - 5994963943259520a^3c^4 - \\
& -165690819368640a^4c^4 + 11870436900000a^5c^4 - 26042015328a^6c^4 - 5516145600a^7c^4 \\
& \quad + 70855680a^8c^4 -
\end{aligned}$$

$$\begin{aligned}
& -10080a^9c^4 - 2016a^{10}c^4 - 804781701766094848c^5 - 173082746257294336ac^5 \\
& \quad - 3095138947918080a^2c^5 + \\
& +628850081495040a^3c^5 + 1766625026880a^4c^5 - 710151349824a^5c^5 + 8365123200a^6c^5 \\
& \quad + 104039040a^7c^5 - \\
& -1794240a^8c^5 + 4032a^9c^5 + 97597927269220352c^6 + 14916118888978432ac^6 \\
& \quad - 53460036102656a^2c^6 - \\
& -39840066986496a^3c^6 + 440358344832a^4c^6 + 22064609280a^5c^6 - 377905920a^6c^6 \\
& \quad + 53760a^7c^6 + 13440a^8c^6 - \\
& -8630073563660288c^7 - 900484605464576ac^7 + 17956861353984a^2c^7 \\
& \quad + 1544786045952a^3c^7 - 30214072320a^4c^7 - \\
& -297246720a^5c^7 + 6850560a^6c^7 - 15360a^7c^7 + 561592474234880c^8 \\
& \quad + 37734427923456ac^8 - 1220290689024a^2c^8 - \\
& -34672999680a^3c^8 + 890799360a^4c^8 - 126720a^5c^8 - 42240a^6c^8 - 26862108708864c^9 \\
& \quad - 1061440635904ac^9 + \\
& +44645061120a^2c^9 + 363292160a^3c^9 - 12587520a^4c^9 + 28160a^5c^9 + 932581163008c^{10} \\
& \quad + 18492289024ac^{10} - \\
& -950208512a^2c^{10} + 135168a^3c^{10} + 67584a^4c^{10} - 22848782336c^{11} - 158523392ac^{11} \\
& \quad + 11010048a^2c^{11} - \\
& -24576a^3c^{11} + 374333440c^{12} - 53248ac^{12} - 53248a^2c^{12} \\
& \quad - 3678208c^{13} + 8192ac^{13} + 16384c^{14}] \tag{32}
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 31-a; \\ c & \end{matrix} ; \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-31} \{\prod_{\vartheta=1}^{30} (\vartheta - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-30}{2})} (-202843204931727360000 \right. \\
& \quad \left. - 329526641070543974400a - \right. \\
& -148192702618125404160a^2 - 21658122462897527040a^3 + 9722889879655680a^4 \\
& \quad + 159098559658389120a^5 - \\
& -967254435840a^6 - 490253327976720a^7 + 9909256423440a^8 + 414792045360a^9 \\
& \quad - 17018472240a^{10} + \\
& +122231760a^{11} + 2840880a^{12} - 52080a^{13} + 240a^{14} + 466802430683494348800c \\
& \quad + 519033146796495256320ac +
\end{aligned}$$

$$\begin{aligned}
& +164949222985279959168a^2c + 14769765039630034320a^3c \\
& - 680706007712528720a^4c - 91750270138593000a^5c + \\
& +2935763232708224a^6c + 161360534973585a^7c - 7364342102145a^8c \\
& + 2500344525a^9c + 3911185523a^{10}c - \\
& -60969405a^{11}c + 109165a^{12}c + 3255a^{13}c - 15a^{14}c - 414075635848567848960c^2 \\
& - 334813261843713392640ac^2 - \\
& -75572573936717905920a^2c^2 - 3508604162375731200a^3c^2 \\
& + 392743927281884160a^4c^2 + \\
& +16485242844787200a^5c^2 - 1178569050412800a^6c^2 - 7610697884160a^7c^2 \\
& + 1309085487360a^8c^2 - \\
& -18023846400a^9c^2 - 167865600a^{10}c^2 + 4999680a^{11}c^2 - 26880a^{12}c^2 \\
& + 199928658130806030336c^3 + \\
& +120313411708083025920ac^3 + 18991014146939294720a^2c^3 \\
& + 228969490870081920a^3c^3 - \\
& -92456288210742080a^4c^3 - 536544028552800a^5c^3 + 178570308069840a^6c^3 \\
& - 2197559659680a^7c^3 - \\
& -82666918320a^8c^3 + 1975394400a^9c^3 - 6824720a^{10}c^3 - 104160a^{11}c^3 + 560a^{12}c^3 \\
& - 60648845538056601600c^4 - \\
& -27329375418592542720ac^4 - 2908495070746890240a^2c^4 + 49850050806835200a^3c^4 \\
& + \\
& +11474023776537600a^4c^4 - 180112947033600a^5c^4 - 12591968417280a^6c^4 \\
& + 315229824000a^7c^4 + 945100800a^8c^4 - \\
& -74995200a^9c^4 + 483840a^{10}c^4 + 12479370238337146880c^5 \\
& + 4192758239972766720ac^5 + \\
& +280853229778835712a^2c^5 - 12726157894300800a^3c^5 - 795295816175040a^4c^5 \\
& + 26431624205280a^5c^5 + \\
& +360301027296a^6c^5 - 16739553600a^7c^5 + 91405440a^8c^5 + 937440a^9c^5 - 6048a^{10}c^5 \\
& - 1822444137279651840c^6 - \\
& -450829569304657920ac^6 - 16543535489064960a^2c^6 + 1351753242255360a^3c^6 \\
& + 27946244229120a^4c^6 - \\
& -1656693964800a^5c^6 + 3348172800a^6c^6 + 399974400a^7c^6 - 3225600a^8c^6 \\
& + 194120876679053312c^7 +
\end{aligned}$$

$$\begin{aligned}
& +34630926348380160ac^7 + 471615845905920a^2c^7 - 83776087272960a^3c^7 \\
& - 132129333120a^4c^7 + \\
& +55017907200a^5c^7 - 462432000a^6c^7 - 3571200a^7c^7 + 28800a^8c^7 \\
& - 15312178746163200c^8 - 1910620958146560ac^8 + \\
& +6959519170560a^2c^8 + 3225307852800a^3c^8 - 27665510400a^4c^8 - 942796800a^5c^8 \\
& + 10137600a^6c^8 + \\
& +899363697520640c^9 + 75101815557120ac^9 - 1211625451520a^2c^9 \\
& - 76032633600a^3c^9 + 1057196800a^4c^9 + \\
& +6547200a^5c^9 - 70400a^6c^9 - 39186998231040c^{10} - 2051861053440ac^{10} \\
& + 50601492480a^2c^{10} + \\
& +1005649920a^3c^{10} - 16220160a^4c^{10} + 1248504659968c^{11} + 37012869120ac^{11} \\
& - 1105397760a^2c^{11} - 5713920a^3c^{11} + \\
& +92160a^4c^{11} - 28242739200c^{12} - 396165120ac^{12} + 12779520a^2c^{12} + 429383680c^{13} \\
& + 1904640ac^{13} - \\
& -61440a^2c^{13} - 3932160c^{14} + 16384c^{15}) + \frac{1}{\Gamma(\frac{c-a}{2})\Gamma(\frac{c+a-31}{2})}(-90587397405593088000 \\
& - 85809869707963968000a - \\
& -24562874768681744640a^2 - 1998123269397359328a^3 + 103194363041532000a^4 \\
& + 12301377002464816a^5 - \\
& -415292450573728a^6 - 21219497625214a^7 + 992922344830a^8 - 596890182a^9 \\
& - 520580634a^{10} + 8143142a^{11} - \\
& -14630a^{12} - 434a^{13} + 2a^{14} + 144240561108261273600c + 104221907769153945600ac \\
& + \\
& +21717111091604815872a^2c + 907956238606835712a^3c - 110873520753201152a^4c \\
& - 4298678159370240a^5c + \\
& +320998107247616a^6c + 1861076883456a^7c - 349590936576a^8c + 4846356480a^9c \\
& + 44506112a^{10}c - 1333248a^{11}c + \\
& +7168a^{12}c - 97158488130721382400c^2 - 53813036357134553088ac^2 \\
& - 7972191332273645568a^2c^2 - \\
& +901353268032a^7c^2 + 32944812768a^8c^2 - 791407680a^9c^2 + 2737952a^{10}c^2 \\
& + 41664a^{11}c^2 - 224a^{12}c^2 + \\
& +37320860741630164992c^3 + 15792177885946970112ac^3 \\
& + 1595260691293962240a^2c^3 -
\end{aligned}$$

$$\begin{aligned}
& -30215467465359360a^3c^3 - 6193795836764160a^4c^3 + 100485128540160a^5c^3 \\
& + 6706712334336a^6c^3 - \\
& -169189171200a^7c^3 - 495452160a^8c^3 + 39997440a^9c^3 - 258048a^{10}c^3 \\
& - 9240641868654624768c^4 - \\
& -2958046488856795136ac^4 - 189415956515840512a^2c^4 + 8876337936464640a^3c^4 \\
& + 530796049376640a^4c^4 - \\
& -17877943030080a^5c^4 - 238041486144a^6c^4 + 11176368000a^7c^4 - 61071360a^8c^4 \\
& - 624960a^9c^4 + 4032a^{10}c^4 + \\
& +1573605911085187072c^5 + 374998609630986240ac^5 + 13181162421780480a^2c^5 \\
& - 1105518682275840a^3c^5 - \\
& -22149881241600a^4c^5 + 1332394721280a^5c^5 - 2754232320a^6c^5 - 319979520a^7c^5 \\
& + 2580480a^8c^5 - \\
& -191329364453654528c^6 - 33165618687913984ac^6 - 426536477895680a^2c^6 \\
& + 79042932261888a^3c^6 + \\
& +111474429696a^4c^6 - 51423375360a^5c^6 + 432391680a^6c^6 + 3333120a^7c^6 - 26880a^8c^6 \\
& + 1696296686688656c^7 + \\
& +2070867300581376ac^7 - 8234460512256a^2c^7 - 3456418775040a^3c^7 \\
& + 29769400320a^4c^7 + 1005649920a^5c^7 - \\
& -10813440a^6c^7 - 1106777235841024c^8 - 90936788625408ac^8 + 1478279835648a^2c^8 \\
& + 91364866560a^3c^8 - \\
& -1270663680a^4c^8 - 7856640a^5c^8 + 84480a^6c^8 + 53078834282496c^9 \\
& + 2747435581440ac^9 - 67843522560a^2c^9 - \\
& -1340866560a^3c^9 + 21626880a^4c^9 - 1847520559104c^{10} - 54358171648ac^{10} \\
& + 1623592960a^2c^{10} + 8380416a^3c^{10} - \\
& -135168a^4c^{10} + 45379223552c^{11} + 633864192ac^{11} - 20447232a^2c^{11} - 745259008c^{12} \\
& - 3301376ac^{12} + \\
& +106496a^2c^{12} + 7340032c^{13} - 32768c^{14})] \tag{33}
\end{aligned}$$

2. MAIN SUMMATION FORMULAE

$${}_2F_1 \left[\begin{matrix} a, & 32 - a ; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] =$$

$$\begin{aligned}
&= \frac{\sqrt{\pi} \Gamma(c)}{2^{c-32} \{\prod_{\varpi=1}^{31} (\varpi - a)\}} \left[\frac{1}{\Gamma(\frac{c-a+1}{2}) \Gamma(\frac{c+a-32}{2})} (393008709555221760000 \right. \\
&\quad + 651194829215986003200a + \\
&\quad + 307720612018593866880a^2 + 51153440461235528688a^3 + 1330940239653764544a^4 \\
&\quad - 296857314253591112a^5 - \\
&\quad - 7921227385233624a^6 + 908822265956143a^7 + 402064837152a^8 - 1099599340796a^9 \\
&\quad + 20437153968a^{10} + \\
&\quad + 154052570a^{11} - 7588896a^{12} + 63308a^{13} - 24a^{14} - a^{15} - 905281327552108953600c \\
&\quad - 1035422190413513441280ac - \\
&\quad - 351184084010029910016a^2c - 38338797951234352128a^3c \\
&\quad + 451749423064008064a^4c + 206106543083095360a^5c - \\
&\quad - 1447679061168672a^6c - 415046253507664a^7c + 8508403087952a^8c \\
&\quad + 199440969840a^9c - 7487180848a^{10}c + \\
&\quad + 47316752a^{11}c + 584304a^{12}c - 7280a^{13}c + 16a^{14}c + 804169092960729907200c^2 \\
&\quad + 674782022139214399488ac^2 + \\
&\quad + 165841199803790742528a^2c^2 + 10946190747818876544a^3c^2 \\
&\quad - 567565724112283456a^4c^2 - \\
&\quad - 48517995647477984a^5c^2 + 1590023100897232a^6c^2 + 53334001088048a^7c^2 \\
&\quad - 2274073929456a^8c^2 + \\
&\quad + 4737986736a^9c^2 + 642792304a^{10}c^2 - 7496944a^{11}c^2 + 9968a^{12}c^2 + 112a^{13}c^2 \\
&\quad - 388961945977802194944c^3 - \\
&\quad - 245240098536550637568ac^3 - 43311426401359084544a^2c^3 \\
&\quad - 1395255045945941760a^3c^3 + \\
&\quad + 165983593526283904a^4c^3 + 4591339102100160a^5c^3 - 322284615941984a^6c^3 \\
&\quad - 765397859520a^7c^3 + \\
&\quad + 208379147424a^8c^3 - 2341805760a^9c^3 - 12518688a^{10}c^3 + 262080a^{11}c^3 - 672a^{12}c^3 \\
&\quad + 118230509217761009664c^4 + \\
&\quad + 56420416163828755456ac^4 + 6990463455382573824a^2c^4 + 33709473394238336a^3c^4 \\
&\quad - 23923420575560640a^4c^4 - \\
&\quad - 35063040521760a^5c^4 + 29185328399808a^6c^4 - 321523472928a^7c^4 - 7433455680a^8c^4 \\
&\quad + 133744800a^9c^4 - \\
&\quad - 310464a^{10}c^4 - 2016a^{11}c^4 - 24381290438326222848c^5 - 8782568098611445760ac^5 \\
&\quad - 730717283214645248a^2c^5 +
\end{aligned}$$

$$\begin{aligned}
& +13675686801784320a^3c^5 + 1956221896719360a^4c^5 - 28876551392640a^5c^5 \\
& \quad - 1297457659008a^6c^5 + \\
& \quad +26112871680a^7c^5 + 40024320a^8c^5 - 2620800a^9c^5 + 8064a^{10}c^5 \\
& \quad + 3568887719037157376c^6 + \\
& +960485441528322048ac^6 + 49667323801539072a^2c^6 - 2072805728685056a^3c^6 \\
& \quad - 91894140143232a^4c^6 + \\
& +2584449716352a^5c^6 + 22947859200a^6c^6 - 826855680a^7c^6 + 2943360a^8c^6 \\
& \quad + 13440a^9c^6 - 381067609873448960c^7 - \\
& -75290787841798144ac^7 - 2072992543587328a^2c^7 + 150201995412480a^3c^7 \\
& \quad + 2162904361728a^4c^7 - \\
& \quad -105258362880a^5c^7 + 189150720a^6c^7 + 10982400a^7c^7 - 42240a^8c^7 \\
& \quad + 30132576016863232c^8 + 4259476607648768ac^8 + \\
& +39713460593664a^2c^8 - 6478199887104a^3c^8 - 3138938880a^4c^8 + 2216670720a^5c^8 \\
& \quad - 11996160a^6c^8 - 42240a^7c^8 - \\
& \quad -1774218876289024c^9 - 172982726737920ac^9 + 673615990784a^2c^9 \\
& \quad + 171263600640a^3c^9 - 1092044800a^4c^9 - \\
& \quad -21964800a^5c^9 + 112640a^6c^9 + 77495587749888c^{10} + 4944943984640ac^{10} \\
& \quad - 63368718336a^2c^{10} - \\
& \quad -2649946112a^3c^{10} + 23586816a^4c^{10} + 67584a^5c^{10} - 2474963632128c^{11} \\
& \quad - 95577284608ac^{11} + 1707290624a^2c^{11} + \\
& +20766720a^3c^{11} - 159744a^4c^{11} + 56117960704c^{12} + 1156386816ac^{12} - 22044672a^2c^{12} \\
& \quad - 53248a^3c^{12} - \\
& -855113728c^{13} - 7454720ac^{13} + 114688a^2c^{13} + 7847936c^{14} + 16384ac^{14} - 32768c^{15}) \\
& + \frac{1}{\Gamma(\frac{c-a}{2})\Gamma(\frac{c+a-31}{2})}(-2808209320881060096000 - 2663360260009726636800a \\
& \quad - 761012930360984837760a^2 - \\
& -59789981041407736848a^3 + 3838097925675257664a^4 + 412887209956538296a^5 \\
& \quad - 17102186004670536a^6 - \\
& -788560364968145a^7 + 45162707702112a^8 - 113794887932a^9 - 29121053808a^{10} \\
& \quad + 578885594a^{11} - 1601376a^{12} - \\
& \quad -54964a^{13} + 504a^{14} - a^{15} + 4565299095163699200000c \\
& \quad + 3321179752803522232320ac +
\end{aligned}$$

$$\begin{aligned}
& +693852416121601198080a^2c + 26869933301958220800a^3c \\
& - 4073155305339587968a^4c - \\
& -144960223788782272a^5c + 13373713249687584a^6c + 48530135178160a^7c \\
& - 17254272251984a^8c + \\
& +297414505584a^9c + 2773686832a^{10}c - 118937840a^{11}c + 953232a^{12}c - 112a^{13}c \\
& - 16a^{14}c - \\
& -3161080629046376939520c^2 - 1773743611853439203328ac^2 \\
& - 264570033924753638400a^2c^2 - \\
& -1405058881009041792a^3c^2 + 1448652525436875584a^4c^2 + 2719092197913376a^5c^2 \\
& - 3193999982297552a^6c^2 + \\
& +50491558757936a^7c^2 + 1813029642480a^8c^2 - 55967482704a^9c^2 + 272830096a^{10}c^2 \\
& + 5276432a^{11}c^2 - 56560a^{12}c^2 + \\
& +112a^{13}c^2 + 1257211815368285749248c^3 + 542821659317684920320ac^3 \\
& + 55394584008959679488a^2c^3 - \\
& -1371732146004729600a^3c^3 - 249881887807080064a^4c^3 + 5098386147168960a^5c^3 \\
& + 325475917621088a^6c^3 - \\
& -10145058512064a^7c^3 - 25272802464a^8c^3 + 3568138560a^9c^3 - 34317024a^{10}c^3 \\
& + 4032a^{11}c^3 + 672a^{12}c^3 - \\
& -324881117647402082304c^4 - 107015854008936485888ac^4 \\
& - 6926032383442477824a^2c^4 + \\
& +388761985674363776a^3c^4 + 23023713558513600a^4c^4 - 940801602446880a^5c^4 \\
& - 12549395769792a^6c^4 + \\
& +787489416672a^7c^4 - 5878918080a^8c^4 - 79144800a^9c^4 + 1020096a^{10}c^4 - 2016a^{11}c^4 \\
& + 58269865681132978176c^5 + \\
& +14434175239659732992ac^5 + 507569977317398528a^2c^5 - 51503477691302400a^3c^5 \\
& - 1031098175523840a^4c^5 + \\
& +78913013289600a^5c^5 - 261319992192a^6c^5 - 28545135360a^7c^5 + 343176960a^8c^5 \\
& - 40320a^9c^5 - 8064a^{10}c^5 - \\
& -7542483540103512064c^6 - 1375984874765199360ac^6 - 16369409928073728a^2c^6 \\
& + 4065809536857088a^3c^6 + \\
& +1341327292032a^4c^6 - 3613476171648a^5c^6 + 40882033920a^6c^6 + 422096640a^7c^6 \\
& - 6814080a^8c^6 + 13440a^9c^6 +
\end{aligned}$$

$$\begin{aligned}
& +721205116854075392c^7 + 94113516697784320ac^7 - 588042790421504a^2c^7 \\
& - 203145224764416a^3c^7 + \\
& +2278013244672a^4c^7 + 89713367040a^5c^7 - 1438103040a^6c^7 + 168960a^7c^7 \\
& + 42240a^8c^7 - 51580334106447872c^8 - \\
& -4622210372353024ac^8 + 93568112901120a^2c^8 + 6406705933056a^3c^8 \\
& - 118823147520a^4c^8 - 994920960a^5c^8 + \\
& +21457920a^6c^8 - 42240a^7c^8 + 2769079768711168c^9 + 160632598511616ac^9 \\
& - 4979646746624a^2c^9 - \\
& -119617935360a^3c^9 + 2876262400a^4c^9 - 337920a^5c^9 - 112640a^6c^9 \\
& - 111011105390592c^{10} - 3805382496256ac^{10} + \\
& +150700222464a^2c^{10} + 1061226496a^3c^{10} - 34400256a^4c^{10} + 67584a^5c^{10} \\
& + 3272190984192c^{11} + 56546713600ac^{11} - \\
& -2719428608a^2c^{11} + 319488a^3c^{11} + 159744a^4c^{11} - 68803764224c^{12} - 418050048ac^{12} \\
& + 27156480a^2c^{12} \\
& -53248a^3c^{12} + 976224256c^{13} - 114688ac^{13} - 114688a^2c^{13} \\
& - 8372224c^{14} + 16384ac^{14} + 32768c^{15}] \quad (34)
\end{aligned}$$

$$\begin{aligned}
& {}_2F_1 \left[\begin{matrix} a, & 33-a; \\ c & ; \end{matrix} \quad \frac{1}{2} \right] = \\
& = \frac{\sqrt{\pi} \Gamma(c)}{2^{c-33} \left\{ \prod_{\tau=1}^{32} (\tau-a) \right\}} \left[\frac{1}{\Gamma\left(\frac{c-a+1}{2}\right) \Gamma\left(\frac{c+a-32}{2}\right)} (12576278705767096320000 \right. \\
& \quad + 20851860424556970547200a + \\
& \quad + 9854947407585176052480a^2 + 1624435436389013576064a^3 \\
& \quad + 34691223091312022544a^4 - \\
& \quad -10657758864295730880a^5 - 242490144783523000a^6 + 36347810238286008a^7 \\
& \quad - 92082876669487a^8 - \\
& \quad -50233536212640a^9 + 1138218046460a^{10} + 7765026192a^{11} - 552484058a^{12} \\
& \quad + 6172320a^{13} - 4940a^{14} - 264a^{15} + \\
& \quad + a^{16} - 29375637080868126720000c - 33822953521504663633920ac \\
& \quad - 11534741688339332628480a^2c - \\
& \quad -1247318164867203416064a^3c + 22820178739934550016a^4c \\
& \quad + 7574669592594306048a^5c - \\
& \quad -84914980281410048a^6c - 17316950021682432a^7c + 433392396752128a^8c \\
& \quad + 9606215587584a^9c -
\end{aligned}$$

$$\begin{aligned}
& -460516397824a^{10}c + 3803095296a^{11}c + 52672256a^{12}c - 1005312a^{13}c + 4352a^{14}c \\
& + 26669053078361541181440c^2 + \\
& + 22655654678828527386624ac^2 + 5628843122258229460992a^2c^2 \\
& + 364720598945819922432a^3c^2 - \\
& -22957429020158350336a^4c^2 - 1849106009143236096a^5c^2 \\
& + 73265900144129792a^6c^2 + 2327692620840576a^7c^2 - \\
& -122805604797568a^8c^2 + 434231597184a^9c^2 + 46423237504a^{10}c^2 - 727106688a^{11}c^2 \\
& + 1558144a^{12}c^2 + 29568a^{13}c^2 - \\
& -128a^{14}c^2 - 13276554097840248324096c^3 - 8527557701096075034624ac^3 \\
& - 1531141541685441052672a^2c^3 - \\
& -46499966481831751680a^3c^3 + 6834918833916766208a^4c^3 \\
& + 178742102347607040a^5c^3 - \\
& -15578800189494784a^6c^3 - 14483139922944a^7c^3 + 12676556057088a^8c^3 \\
& - 181619665920a^9c^3 - 1088844288a^{10}c^3 + \\
& + 36191232a^{11}c^3 - 182784a^{12}c^3 + 4183912176750576009216c^4 \\
& + 2048627772744257667072ac^4 + \\
& + 259599284321332817920a^2c^4 + 476692959245589504a^3c^4 \\
& - 1042172568281602560a^4c^4 + 591530393836800a^5c^4 + \\
& + 1548005345752448a^6c^4 - 21488964279552a^7c^4 - 529593246336a^8c^4 \\
& + 12925059840a^9c^4 - 46134144a^{10}c^4 - \\
& -532224a^{11}c^4 + 2688a^{12}c^4 - 901671972868968153088c^5 \\
& - 33610625925803307648ac^5 - \\
& -28768633067902959616a^2c^5 + 678076651803893760a^3c^5 + 92218372409180160a^4c^5 \\
& - 1692557156505600a^5c^5 - \\
& -77849036998656a^6c^5 + 1993171783680a^7c^5 + 2814873600a^8c^5 - 361912320a^9c^5 \\
& + 2193408a^{10}c^5 + \\
& + 139192132696440569856c^6 + 39163709061769003008ac^6 \\
& + 2092243353303842816a^2c^6 - \\
& -104389799581224960a^3c^6 - 4779754566062080a^4c^6 + 165520520782848a^5c^6 \\
& + 1574992505856a^6c^6 - \\
& -79698769920a^7c^6 + 428144640a^8c^6 + 3548160a^9c^6 - 21504a^{10}c^6 \\
& - 15842385815912054784c^7 -
\end{aligned}$$

$$\begin{aligned}
& -3313937807940452352ac^7 - 93891013177229312a^2c^7 + 8286819500703744a^3c^7 \\
& + 125191632039936a^4c^7 - \\
& -7962071040000a^5c^7 + 22036439040a^6c^7 + 1516584960a^7c^7 - 11489280a^8c^7 \\
& + 1352753717551824896c^8 + \\
& +205696018035695616ac^8 + 1846128096868352a^2c^8 - 407844026320896a^3c^8 \\
& + 81687783936a^4c^8 + \\
& +213236305920a^5c^8 - 1724574720a^6c^8 - 11151360a^7c^8 + 84480a^8c^8 \\
& - 87414807455596544c^9 - \\
& -9359636030029824ac^9 + 52940629147648a^2c^9 + 12879850536960a^3c^9 \\
& - 111737077760a^4c^9 - 3033169920a^5c^9 + \\
& +30638080a^6c^9 + 4279210143121408c^{10} + 308423755825152ac^{10} \\
& - 5039751135232a^2c^{10} - 254518640640a^3c^{10} + \\
& +3365683200a^4c^{10} + 17842176a^5c^{10} - 180224a^6c^{10} - 157590197633024c^{11} \\
& - 7158795730944ac^{11} + \\
& +169615753216a^2c^{11} + 2867724288a^3c^{11} - 43450368a^4c^{11} + 4293100830720c^{12} \\
& + 110927511552ac^{12} - \\
& -3129491456a^2c^{12} - 14057472a^3c^{12} + 212992a^4c^{12} - 83852525568c^{13} \\
& - 1029439488ac^{13} + 31195136a^2c^{13} + \\
& +1109917696c^{14} + 4325376ac^{14} - 131072a^2c^{14} - 8912896c^{15} + 32768c^{16}) \\
& + \frac{1}{\Gamma(\frac{c-a}{2}) \Gamma(\frac{c+a-33}{2})} (-65536c^{15} + 16711680c^{14} + 229376a^2c^{13} - 7569408ac^{13} \\
& - 1944649728c^{13} - \\
& -50692096a^2c^{12} + 1672839168ac^{12} + 136767275008c^{12} - 319488a^4c^{11} \\
& + 21086208a^3c^{11} + 4700200960a^2c^{11} - \\
& -166588071936ac^{11} - 6490170392576c^{11} + 59744256a^4c^{10} - 3943120896a^3c^{10} \\
& - 234336886784a^2c^{10} + \\
& +9880146591744ac^{10} + 219687595212800c^{10} + 225280a^6c^9 - 22302720a^5c^9 \\
& - 4212961280a^4c^9 + \\
& +318534881280a^3c^9 + 6385782734848a^2c^9 - 388581283774464ac^9 \\
& - 5467350755508224c^9 - 34467840a^6c^8 + \\
& +3412316160a^5c^8 + 126600376320a^4c^8 - 14548978667520a^3c^8 - 63061551218688a^2c^8 \\
& +
\end{aligned}$$

$$\begin{aligned}
& +10677406306811904ac^8 + 101605453158088704c^8 - 84480a^8c^7 + 11151360a^7c^7 \\
& + 1727278080a^6c^7 - \\
& -213503938560a^5c^7 - 132194118144a^4c^7 + 411663197620224a^3c^7 \\
& - 1770221953955840a^2c^7 - \\
& -210333358052302848ac^7 - 1417367362882437120c^7 + 10053120a^8c^6 \\
& - 1327011840a^7c^6 - 19603584000a^6c^6 + \\
& +6998660444160a^5c^6 - 108366929459712a^4c^6 - 7386371104831488a^3c^6 \\
& + 81588957922920448a^2c^6 + \\
& +2998385401531441152ac^6 + 14789061893062983680c^6 + 16128a^{10}c^5 - 2661120a^9c^5 \\
& - 321699840a^8c^5 + \\
& +59852136960a^7c^5 - 1169166679296a^6c^5 - 125633606757120a^5c^5 \\
& + 3584138069952000a^4c^5 + \\
& +81155276599034880a^3c^5 - 1581946349642745856a^2c^5 - 30822380253791182848ac^5 \\
& - \\
& -113998595959458562048c^5 - 1370880a^{10}c^4 + 226195200a^9c^4 - 1709030400a^8c^4 \\
& - 1252367424000a^7c^4 + \\
& +48558756153600a^6c^4 + 1092730056042240a^5c^4 - 58182434494609920a^4c^4 \\
& - 460255718632596480a^3c^4 + \\
& +18390328035742767104a^2c^4 + 224712599605813321728ac^4 \\
& + 634238712296638578688c^4 - 1344a^{12}c^3 + \\
& +266112a^{11}c^3 + 23120832a^{10}c^3 - 6471400320a^9c^3 + 263725670208a^8c^3 \\
& + 10943807124096a^7c^3 - \\
& -777928079414464a^6c^3 - 711059420649600a^5c^3 + 533035048250363648a^4c^3 \\
& + 25486745680704000a^3c^3 - \\
& -135043097758270087168a^2c^3 - 1123667660559841959936ac^3 \\
& - 2449470002402175418368c^3 + 68544a^{12}c^2 - \\
& -13571712a^{11}c^2 + 405574848a^{10}c^2 + 68559765120a^9c^2 - 4757196954048a^8c^2 \\
& + 2935731705984a^7c^2 + \\
& +5939303383785024a^6c^2 - 64891677848976000a^5c^2 - 2678695653148796160a^4c^2 + \\
& +16568080735699671552a^3c^2 + 610385093977265700864a^2c^2 \\
& + 3626708216318306279424ac^2 + \\
& +6147778466426910474240c^2 + 32a^{14}c - 7392a^{13}c - 390880a^{12}c + 182042784a^{11}c \\
& - 11582726176a^{10}c -
\end{aligned}$$

$$\begin{aligned}
& -115023090336a^9c + 30965876629600a^8c - 571118887841568a^7c \\
& - 19091657228488064a^6c + \\
& +461856383439694848a^5c + 6264028269209728000a^4c - 91339795704196148736a^3c \\
& - \\
& -1538581445063915139072a^2c - 6717806419589716746240ac \\
& - 8864971566659828121600c - 544a^{14} + \\
& +125664a^{13} - 6561184a^{12} - 479910816a^{11} + 57700381088a^{10} - 1178029251168a^9 \\
& - 55758969524192a^8 + \\
& +2166179809154592a^7 + 12571450930103296a^6 - 968963896585149696a^5 \\
& - 3718430128264001024a^4 + \\
& +161641469374376538624a^3 + 1636843212624447221760a^2 \\
& + 5336242598307820953600a +) \\
& +5446224138734346240000] \tag{35}
\end{aligned}$$

3. EVALUATION OF THE MAIN FORMULAE

Involving the contiguous relation (8) and the formula of Salahuddin et al (33), the result (34) can be established and on the same way result(35) can be established.

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