ID	Expression	Analytical sum
1	$\sum_{n=1}^{\infty} \varepsilon^{-1+n}\, \mathrm{ddP}[n,0]$	$\frac{-c w^2+3 s^2 \varepsilon}{w^5}$
2	$\sum_{n=1}^{\infty} n\, \varepsilon^{-1+n}\, \mathrm{ddP}[n,0]$	$\frac{-c w^2+c(5s^2+2w^2)\varepsilon^2-\varepsilon(w^2+s^2(-5-2w^2+10\varepsilon^2))}{w^7}$
3	$\sum_{n=1}^{\infty} n^2\, \varepsilon^{-1+n}\, \mathrm{ddP}[n,0]$	$-\frac{c}{w^5}+\frac{(-5+15s^2-2w^2+4s^2w^2)\varepsilon}{w^7}+\frac{c(35s^2+5w^2+25s^2w^2+w^4)\varepsilon^2}{w^9}-\frac{5(-7+7c^4+21s^2-w^2+3s^2w^2)\varepsilon^3}{w^9}-\frac{5c(7s^2+w^2)\varepsilon^4}{w^9}+\frac{35s^2\varepsilon^5}{w^9}$
4	$\sum_{n=1}^{\infty} n^3\, \varepsilon^{-1+n}\, \mathrm{ddP}[n,0]$	$\frac{9s^2\varepsilon(1+15c\varepsilon+18(-2+c^2)\varepsilon^2+c(-39+c^2)\varepsilon^3-3(-20+c^2)\varepsilon^4-9c\varepsilon^5-8\varepsilon^6)}{w^{11}}+\frac{1}{w^9}\left(-4c^4\varepsilon^3+9c^3\varepsilon^2(-6+\varepsilon^2)-3\varepsilon(-5+13\varepsilon^2+3\varepsilon^4)+3c^2\varepsilon(-10+27\varepsilon^2+6\varepsilon^4)+c(-1+72\varepsilon^2-66\varepsilon^4+8\varepsilon^6)\right)$
5	$\sum_{n=1}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,0]}{n}$	$-\frac{8c+4(-7+4s^2)\varepsilon+c(35+c^2-3s^2)\varepsilon^2+4(-5+3s^2)\varepsilon^3+4c\varepsilon^4}{4w^3(1+w-c\varepsilon)^2}+\frac{\varepsilon(5-2s^2+\varepsilon^2)-2c(1+2\varepsilon^2)}{w^2(1+w-c\varepsilon)^2}$
6	$\sum_{n=2}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,0]}{-1+n}$	$\frac{2s^2\varepsilon}{w^2(1+w-c\varepsilon)^2}+\frac{-c+\varepsilon+2s^2\varepsilon}{w(1+w-c\varepsilon)^2}+\frac{c w-6c^2\varepsilon+(4+(-3+5s^2)w)\varepsilon}{(1+w-c\varepsilon)^2}+\frac{\varepsilon(s^2+c\varepsilon(-1+c^2(1-w^3(-3+\mathrm{Log}[2]))))}{w^3(1+w-c\varepsilon)^2}+\frac{c(-\varepsilon^2\mathrm{Log}[2]-(1+w)\mathrm{Log}[4]+c\varepsilon(-2+w\,\mathrm{Log}[4]+\mathrm{Log}[16]))}{(1+w-c\varepsilon)^2}+\frac{c(2(1+w)-2c(2+w)\varepsilon-(-2+s^2)\varepsilon^2)\mathrm{Log}[1+w-c\varepsilon]}{(1+w-c\varepsilon)^2}$
7	$\sum_{n=1}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,0]}{1+n}$	$\frac{-c+c w+\varepsilon}{s^2 w\varepsilon^2}+\frac{-\varepsilon+c\varepsilon^2}{w^3\varepsilon^2}$
8	$\sum_{n=1}^{\infty} n^2\, \varepsilon^{-1+n}\, \mathrm{ddP}[n,1]$	$\frac{s(-2+w^2)}{w^5}+\frac{c s(-50+9w^2)\varepsilon}{w^7}+\frac{5s(28+w^4-c^2(49+6w^2))\varepsilon^2}{w^9}-\frac{1}{w^{11}}5s\varepsilon^3\left(-98c^4\varepsilon+16c^3(7+2\varepsilon^2)+6c^2\varepsilon(11+3\varepsilon^2)+\varepsilon(79+63s^4-45\varepsilon^2+2\varepsilon^4)+c(-139-34\varepsilon^2+7\varepsilon^4)\right)$
9	$\sum_{n=1}^{\infty} n\, \varepsilon^{-1+n}\, \mathrm{ddP}[n,1]$	$\frac{s(35s^2\varepsilon^2(1+(c-2\varepsilon)\varepsilon)+w^4(-1+2\varepsilon(-2c+\varepsilon))+5w^2\varepsilon(2\varepsilon+c(-3-5c\varepsilon+6\varepsilon^2)))}{w^9}$
10	$\sum_{n=1}^{\infty} \varepsilon^{-1+n}\, \mathrm{ddP}[n,1]$	$\frac{15s^3\varepsilon^2}{w^7}-\frac{s(w^2+9c\varepsilon)}{w^5}$
11	$\sum_{n=1}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,1]}{n}$	$-\frac{s}{w^3}-\frac{3s(c-\varepsilon)\varepsilon}{w^5}+\frac{s\varepsilon^2((1+w)^2-c\varepsilon)}{w^3(1+w-c\varepsilon)^2}$
12	$\sum_{n=1}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,1]}{1+n}$	$s\left(\frac{1}{w^3}-\frac{3(1-c\varepsilon)}{w^5}+\frac{\frac{1}{w}+\frac{(1+w)^2}{1+w-c\varepsilon}}{w^2(1+w-c\varepsilon)}\right)$
13	$\sum_{n=1}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,1]}{n^2}$	$-\frac{s}{w^3}-\frac{1}{s w}+\frac{(1+c^2)\mathrm{Log}\left[\frac{1+c}{c+w-\varepsilon}\right]+2c\,\mathrm{Log}\left[\frac{1}{2}(1+w-c\varepsilon)\right]}{s^3\varepsilon}$
14	$\sum_{n=2}^{\infty} n\, \varepsilon^{-1+n}\, \mathrm{ddP}[n,2]$	$\frac{12(1-2s^2)\varepsilon}{w^5}+\frac{15c(2-19s^2)\varepsilon^2}{w^7}+\frac{15(-35s^2+63s^4+2(1-2c^2)w^2)\varepsilon^3}{w^9}+\frac{105s^2\varepsilon^4(9cs^2+5cw^2-9s^2\varepsilon)}{w^{11}}$
15	$\sum_{n=2}^{\infty} \varepsilon^{-1+n}\, \mathrm{ddP}[n,2]$	$\frac{3\varepsilon((2-4s^2)w^4-25cs^2w^2\varepsilon+35s^4\varepsilon^2)}{w^9}$
16	$\sum_{n=2}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,2]}{n}$	$\frac{2(-2+2w^3)}{s^2w^3\varepsilon}+\frac{3c(-1+w^2+c\varepsilon)}{w^5}+\frac{2c(1+2w^2+c\varepsilon)}{s^2w^3}+\frac{3s^2\varepsilon(-3+\varepsilon(c+2\varepsilon))}{w^7}+\frac{6c(\varepsilon+c(-2+2w+c\varepsilon))}{s^4w\varepsilon}$
17	$\sum_{n=2}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,2]}{-1+n}$	$\frac{9c+4c^3-c^5}{s^4}+\frac{5c\varepsilon^2(-11+c^2+10c\varepsilon-30\varepsilon^2)}{w^7}+\frac{(c-\varepsilon)(1+2\varepsilon(c+6\varepsilon))}{w^5}-\frac{2(c-\varepsilon)(-1+\varepsilon^2(-25+6c\varepsilon-4\varepsilon^2))}{s^2w^5}+\frac{12(c-\varepsilon)(-1-\varepsilon^2(6+\varepsilon^2)+4c(\varepsilon+\varepsilon^3))}{s^4w^5}-\frac{5\varepsilon(3+c^4+20c^2\varepsilon^2(2+\varepsilon^2)-4c\varepsilon(5+10\varepsilon^2+\varepsilon^4))}{s^2w^7}$
18	$\sum_{n=2}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,2]}{1+n}$	$-\frac{7c(31+5c^4-26s^2)}{s^4w^7}+\frac{2c(5+c^2)(-1+w^7)}{s^4w^7\varepsilon^2}+\frac{14(5+c^4-5s^2)}{s^4w^7\varepsilon}+\frac{(181+200c^4+39c^6-183s^2)\varepsilon}{s^4w^7}-\frac{c(3(99+40c^4+c^6)-241s^2)\varepsilon^2}{s^4w^7}+\frac{(103+155c^4-6c^6-86s^2)\varepsilon^3}{s^4w^7}+\frac{4(-3+2s^2)(7c-\varepsilon)\varepsilon^4}{s^4w^7}$
19	$\sum_{n=2}^{\infty} \frac{\varepsilon^{-1+n}\, \mathrm{ddP}[n,2]}{n^2}$	$-\frac{3s^2\varepsilon}{w^5}+\frac{-2-c^2+2w+c^2w-3c\varepsilon}{s^2w\varepsilon}-\frac{w^2-w^3+\varepsilon^2}{w^3\varepsilon}-\frac{12c^2\mathrm{Log}[2]}{s^4\varepsilon}-\frac{\mathrm{Log}[16]}{s^2\varepsilon}+\frac{2c(5+c^2)\mathrm{Log}\left[-\frac{-c+w+\varepsilon}{-1+c}\right]}{s^4\varepsilon}+\frac{4(1+2c^2)\mathrm{Log}[1+w-c\varepsilon]}{s^4\varepsilon}$