

Input:

$$\left\{4\,\pi\times\frac{\left(\frac{2}{3}\,(N-1)\right)^{2}\log\!\left(\sqrt{\,Z^{2/3\,d}\,}\right)}{\frac{4\,\pi\left(N\times\frac{N-1}{6}\right)}{\sqrt{\delta}}+2\,\pi\times\frac{Z}{9}},\,d=1,\,Z=3,\,N=4,\,\delta=1\right\}$$

Exact result:

$$\Big\{\frac{16\,\pi\,(N-1)^2\,\mathrm{log}\!\left(\!\sqrt{\,Z^{\!(2\,d)\!/3}\,}\right)}{9\!\left(\!\frac{2\,\pi\,(N-1)\,N}{3\,\sqrt{\delta}}\!+\!\frac{2\,\pi\,Z}{9\,\delta}\right)},\,d=1,\,Z=3,\,N=4,\,\delta=1\Big\}$$

Substitution:

$$\frac{4\delta (N-1)^2 \log (Z^{(2d)/3})}{3\sqrt{\delta} (N-1) N+Z} = \frac{8 \log(3)}{13}$$

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