On some Ramanujan formulas concerning Highly composite numbers: new possible mathematical connections with various parameters of Particle Physics, Dark Matter, Dark Energy and Cosmology III.

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Abstract

In this research thesis, we have analyzed further Ramanujan formulas inherent Highly composite numbers and described new possible mathematical connections with various parameters of Particle Physics, Dark Matter, Dark Energy and Cosmology

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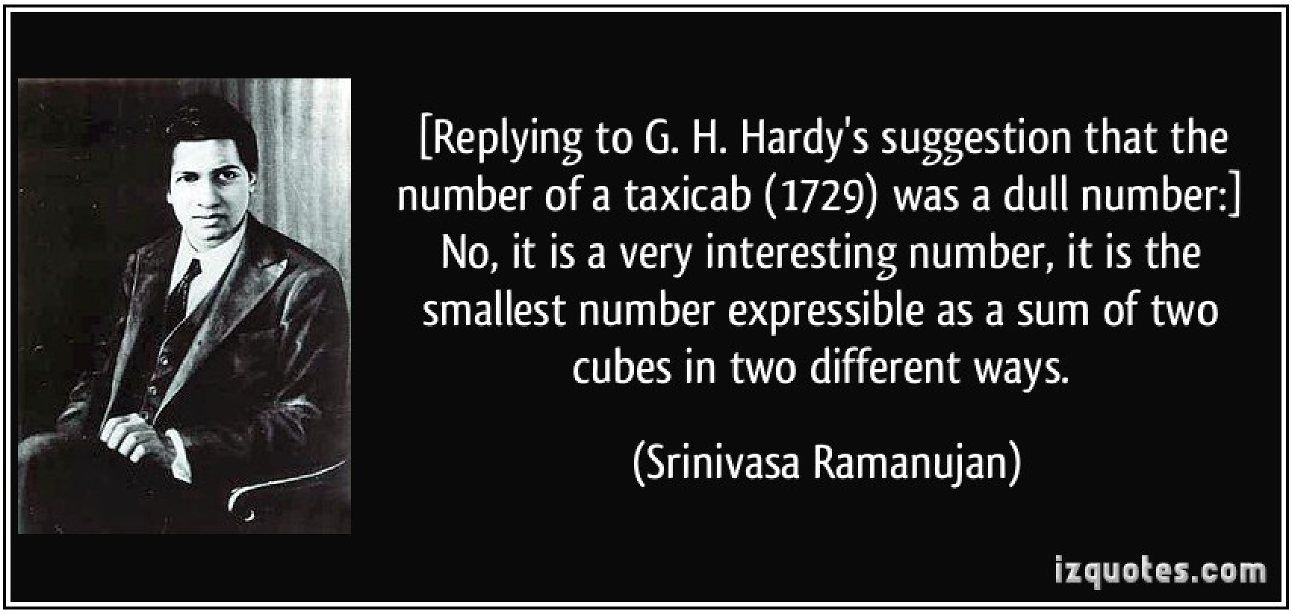


https://sites.google.com/a/wusd.ws/mr-martinez-geometry-bls/mathemetician-of-the-month/srinivasaramanujan

From:

Highly composite numbers
Proceedings of the London Mathematical Society, 2, XIV, 1915, 347 – 409

$$\log dd(N) = -\frac{\log p_1}{\log 2} \log\left\{(1-\tfrac{1}{2})(1-\tfrac{1}{3})\ldots\left(1-\frac{1}{\lambda}\right)\right\}$$
$$+ O\{\sqrt{(\log p_1 \log\log p_1)} \log\log\log p_1\}$$
$$-\frac{\log p_1}{\log 2}\log\left\{\left(1-\frac{1}{\lambda'}\right)\left(1-\frac{1}{\lambda''}\right)\ldots\left(1-\frac{1}{\varpi}\right)\right\} + O\left(\frac{\log p_1}{\log\log p_1}\right)$$
$$= -\frac{\log p_1}{\log 2}\log\left\{(1-\tfrac{1}{2})(1-\tfrac{1}{3})\ldots\left(1-\frac{1}{\varpi}\right)\right\} + O\left(\frac{\log p_1}{\log\log p_1}\right)$$
$$= \frac{\log p_1}{\log 2}\left\{\log\log\varpi + \gamma + O\left(\frac{1}{\log\varpi}\right)\right\} + O\left(\frac{\log p_1}{\log\log p_1}\right)$$
$$= \frac{\log p_1}{\log 2}\left\{\log\log\log p_1 + \gamma + O\left(\frac{1}{\log\log p_1}\right)\right\} + O\left(\frac{\log p_1}{\log\log p_1}\right)$$
$$= \frac{\log\log N}{\log 2}\left\{\log\log\log\log N + \gamma + O\left(\frac{1}{\log\log\log N}\right)\right\}, \qquad \ldots\ldots(180)$$

We have that:

$$\frac{\log\log N}{\log 2}\left\{\log\log\log\log N + \gamma + O\left(\frac{1}{\log\log\log N}\right)\right\}$$

For N = $7.912454053394034144 \times 10^{21}$

(2^8*3^4*5^3*7^2*11*13*17*19*23*29*31*37*41*43)

Input:

$2^8 \times 3^4 \times 5^3 \times 7^2 \times 11 \times 13 \times 17 \times 19 \times 23 \times 29 \times 31 \times 37 \times 41 \times 43$

Result:

7 912 454 053 394 034 144 000

Scientific notation:

$7.912454053394034144 \times 10^{21}$

$7.912454053394034144*10^{21}$

For O = 233, we obtain:

ln ln (7.912454053394034144 × 10^21) * 1/(ln(2))* (ln ln ln ln (7.912454053394034144 × 10^21)+Euler-Mascheroni constant+233(1/(ln ln ln (7.912454053394034144 × 10^21)))

Input interpretation:

$$\log(\log(7.912454053394034144 \times 10^{21})) \times \frac{1}{\log(2)} \left(\log(\log(\log(\log(7.912454053394034144 \times 10^{21})))) + \gamma + 233 \times \frac{1}{\log(\log(\log(7.912454053394034144 \times 10^{21})))}\right)$$

log(x) is the natural logarithm

γ is the Euler-Mascheroni constant

Result:

969.635284214442194090...

969.6352842…

1/2((((ln ln (7.912454053394034144 × 10^21) * 1/(ln(2))* (ln ln ln ln (7.912454053394034144 × 10^21)+Euler-Mascheroni constant+233(1/(ln ln ln (7.912454053394034144 × 10^21))))))))

Input interpretation:

$$\frac{1}{2}\left(\log(\log(7.912454053394034144 \times 10^{21})) \times \frac{1}{\log(2)} \left(\log(\log(\log(\log(7.912454053394034144 \times 10^{21})))) + \gamma + 233 \times \frac{1}{\log(\log(\log(7.912454053394034144 \times 10^{21})))}\right)\right)$$

log(x) is the natural logarithm

γ is the Euler-Mascheroni constant

Result:

484.817642107221097045...

484.8176421...... result very near to Holographic Ricci dark energy model, where

$$\chi^2_{\mathrm{RDE}} = 483.130.$$

1/47((((ln ln (7.912454053394034144 × 10^21) * 1/(ln(2))* (ln ln ln ln (7.912454053394034144 × 10^21)+Euler-Mascheroni constant+233(1/(ln ln ln (7.912454053394034144 × 10^21))))))))-4

Input interpretation:

$$\frac{1}{47}\left(\log(\log(7.912454053394034144\times 10^{21}))\times \frac{1}{\log(2)}\left(\log(\log(\log(\log(7.912454053394034144\times 10^{21})))) + \gamma + 233\times \frac{1}{\log(\log(\log(7.912454053394034144\times 10^{21})))}\right)\right) - 4$$

$\log(x)$ is the natural logarithm

γ is the Euler-Mascheroni constant

Result:

16.63053796200940838 49...

16.630537962.... result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

[1/729(((ln ln (7.912454053394034144e+21) * 1/(ln(2))* (ln ln ln ln (7.912454053394034144e+21)+Euler-Mascheroni constant+233(1/(ln ln ln (7.912454053394034144e+21)))])))))-(29-7)/10^2-(47-3)/10^4

Input interpretation:

$$\frac{1}{729}\left(\log(\log(7.912454053394034144\times 10^{21}))\times \frac{1}{\log(2)}\left(\log(\log(\log(\log(7.912454053394034144\times 10^{21})))) + \gamma + 233\times \frac{1}{\log(\log(\log(7.912454053394034144\times 10^{21})))}\right)\right) - \frac{29-7}{10^2} - \frac{47-3}{10^4}$$

$\log(x)$ is the natural logarithm

γ is the Euler-Mascheroni constant

Result:

1.105689553106230718 92...

1.10568955…

1/(10^52) [((((((1/729(((ln ln (7.912454e+21)1/(ln(2))(ln ln ln ln (7.912454e+21)+0.5772156+233(1/(ln ln ln (7.912454e+21)))))))))))))-(29-7)/10^2-(47-3)/10^4]

Input interpretation:

$$\frac{1}{10^{52}}\left(\frac{1}{729}\left(\log(\log(7.912454\times 10^{21}))\times\frac{1}{\log(2)}\left(\log(\log(\log(\log(7.912454\times 10^{21})))) + 0.5772156 + 233\times\frac{1}{\log(\log(\log(7.912454\times 10^{21})))}\right)\right)-\frac{29-7}{10^2}-\frac{47-3}{10^4}\right)$$

log(x) is the natural logarithm

Result:

$1.10568955\ldots\times 10^{-52}$

$1.10568955\ldots * 10^{-52}$

result practically equal to the value of Cosmological Constant $1.1056*10^{-52}$ m^{-2}

[1/7(((ln ln (7.9124540533940341 44e+21) * 1/(ln(2))* (ln ln ln ln (7.9124540533940341 44e+21)+Euler-Mascheroni constant+233(1/(ln ln ln (7.9124540533940341 44e+21)))])))+1/golden ratio

Input interpretation:

$$\frac{1}{7}\left(\log(\log(7.912454053394034144\times 10^{21}))\times\frac{1}{\log(2)}\left(\log(\log(\log(\log(7.912454053394034144\times 10^{21})))) + \gamma + 233\times\frac{1}{\log(\log(\log(7.912454053394034144\times 10^{21})))}\right)\right)+\frac{1}{\phi}$$

log(x) is the natural logarithm

γ is the Euler-Mascheroni constant

ϕ is the golden ratio

Result:

139.137360305098779718…

139.1373603…. result practically equal to the rest mass of Pion meson 139.57 MeV

Now, we have that:

Hence we have

$$d(N) < \frac{\{(1/n)\log(p_1p_2p_3\cdots p_nN)\}^n}{\log p_1 \log p_2 \log p_3 \cdots \log p_n}, \tag{3}$$

for all values of N.

The following examples shew how close an approximation to $d(N)$ may be given by the right-hand side of (3). If

$$N = 2^{72} \cdot 7^{25},$$

then, according to (3), we have

$$d(N) < 1898.00000685\ldots; \tag{11}$$

and as a matter of fact $d(N) = 1898$. Similarly, taking

$$N = 2^{568} \cdot 3^{358},$$

we have, by (3),

$$d(N)) < 204271.000000372\ldots; \tag{12}$$

while the actual value of $d(N)$ is 204271. In a similar manner, when

$$N - 2^{64} \cdot 3^{40} \cdot 5^{27},$$

we have, by (3),

$$d(N) < 74620.00412\ldots; \tag{13}$$

while actually

$$d(N) = 74620.$$

$$N = 2^5 \cdot 3^3 \cdot 5^2 \cdot 7 \cdot 11 \cdot 13.$$

$$(\log 4\pi - \gamma)\sqrt{x} \le R(x)(\log x)^2 \le (4 + \gamma - \log 4\pi)\sqrt{x}.$$

It can easily be verified that

$$\left.\begin{array}{l} \log 4\pi - \gamma = 1.954, \\ 4 + \gamma - \log 4\pi = 2.046 \end{array}\right\}$$

approximately.

$$R(x) = \frac{2\sqrt{x} + \sum \frac{x^\rho}{\rho^2}}{(\log x)^2}$$

We have that:

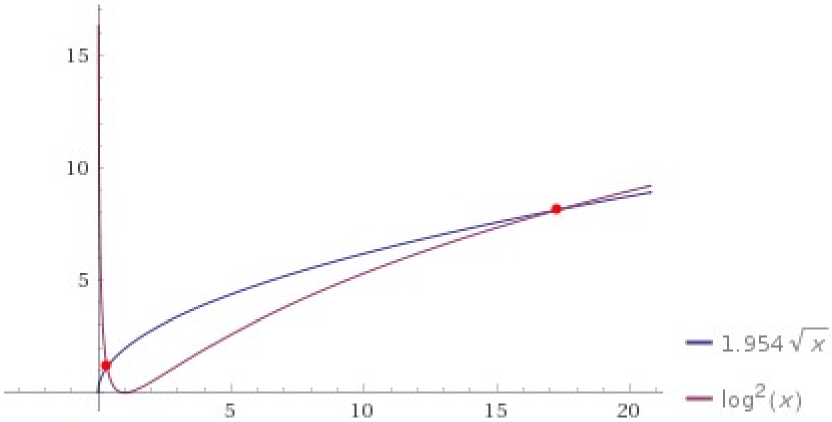
1.954*sqrt(x) = (ln x)^2

Input:

$1.954\sqrt{x} = \log^2(x)$

$\log(x)$ is the natural logarithm

Plot:



Solutions:

$x \approx 17.3084$

$x \approx 0.343072$

$x \approx 226.419$

For x = 17.3084 we obtain:

(ln 17.3084)^2

Input interpretation:

$\log^2(17.3084)$

log(x) is the natural logarithm

Result:

8.129295437640103198741290135270881957463358718520398383624...

1.954*sqrt(17.3084)

Input interpretation:

$1.954\sqrt{17.3084}$

Result:

8.129297569556671112225226336330580536149371982971598491029...

8.1292975...

(((1.954*sqrt(17.3084)))) / ((((ln 17.3084)^2)))

Input interpretation:

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}$$

log(x) is the natural logarithm

Result:

1.000000262251087350365684134344388654790853097333165364580...

1.00000026225108735…… value very near to the following Ramanujan continued fraction:

$$1+\frac{e^{-2\pi\sqrt{5}}}{1+}\frac{e^{-4\pi\sqrt{5}}}{1+\ldots}=\frac{e^{-2\pi/5}}{\frac{\sqrt{5}}{1+\left[5^{3/4}(\phi-1)^{5/2}\right]^{1/5}}-\phi} \qquad (9)$$

$$= 1.000000791267\ \ldots \qquad (10)$$

Alternative representations:

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{17.3084}}{\log_e^2(17.3084)}$$

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{17.3084}}{(\log(a)\log_a(17.3084))^2}$$

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{17.3084}}{(-\text{Li}_1(-16.3084))^2}$$

Series representations:

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{16.3084}\sum_{k=0}^{\infty} e^{-2.79168k}\binom{\frac{1}{2}}{k}}{\log^2(17.3084)}$$

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{16.3084}\sum_{k=0}^{\infty} e^{-2.79168k}\binom{\frac{1}{2}}{k}}{\left(\log(16.3084) - \sum_{k=1}^{\infty}\frac{(-1)^k e^{-2.79168k}}{k}\right)^2}$$

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{16.3084}\sum_{k=0}^{\infty}\frac{(-0.0613181)^k\left(-\frac{1}{2}\right)_k}{k!}}{\left(\log(16.3084) - \sum_{k=1}^{\infty}\frac{(-1)^k e^{-2.79168k}}{k}\right)^2}$$

Integral representations:

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{1.954\sqrt{17.3084}}{\left(\int_1^{17.3084}\frac{1}{t}\,dt\right)^2}$$

$$\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)} = \frac{7.816\, i^2\,\pi^2\sqrt{17.3084}}{\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-2.79168s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2} \quad \text{for } -1 < \gamma < 0$$

R(x) = 1.00000026225108735.....

And:

1/((((((1.954*sqrt(17.3084)))) / ((((ln 17.3084)^2))))))

Input interpretation:

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}$$

log(x) is the natural logarithm

Result:

0.999999737748981425249095835028520713065345799056628356082...

0.999999737748981425249….. result very near to the value of the following Ramanujan continued fraction:

$$\frac{1}{1+}\frac{e^{-2\pi\sqrt{5}}}{1+}\frac{e^{-4\pi\sqrt{5}}}{1+\ldots} = \left\{\frac{\sqrt{5}}{1+\left[5^{3/4}(\phi-1)^{5/2}-1\right]^{1/5}}-\phi\right\}e^{2\pi/\sqrt{5}} \quad (7)$$

$$= 0.99999920\ldots \quad (8)$$

Alternative representations:

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \frac{1}{\frac{1.954\sqrt{17.3084}}{\log_e^2(17.3084)}}$$

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \frac{1}{\frac{1.954\sqrt{17.3084}}{(\log(a)\log_a(17.3084))^2}}$$

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \frac{1}{\frac{1.954\sqrt{17.3084}}{(-\text{Li}_1(-16.3084))^2}}$$

Series representations:

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \frac{0.511771\log^2(17.3084)}{\sqrt{16.3084}\sum_{k=0}^{\infty} e^{-2.79168k}\binom{\frac{1}{2}}{k}}$$

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \left(0.511771\left(\log^2(16.3084) - 2\log(16.3084)\sum_{k=1}^{\infty}\frac{(-1)^k e^{-2.79168k}}{k} + \left(\sum_{k=1}^{\infty}\frac{(-1)^k e^{-2.79168k}}{k}\right)^2\right)\right) \Big/ \left(\sqrt{16.3084}\sum_{k=0}^{\infty} e^{-2.79168k}\binom{\frac{1}{2}}{k}\right)$$

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \left(0.511771\left(\log^2(16.3084) - 2\log(16.3084)\sum_{k=1}^{\infty}\frac{(-1)^k e^{-2.79168k}}{k} + \left(\sum_{k=1}^{\infty}\frac{(-1)^k e^{-2.79168k}}{k}\right)^2\right)\right) \Big/ \left(\sqrt{16.3084}\sum_{k=0}^{\infty}\frac{(-0.0613181)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

Integral representations:

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \frac{0.511771\left(\int_1^{17.3084}\frac{1}{t}\,dt\right)^2}{\sqrt{17.3084}}$$

$$\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}} = \frac{0.127943\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-2.79168s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{i^2\pi^2\sqrt{17.3084}} \quad \text{for } -1 < \gamma < 0$$

From which, we obtain:

((((1/((((((1.954*sqrt(17.3084)))) / ((((ln 17.3084)^2)))))))))^4096

Input interpretation:

$$\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)^{4096}$$

log(x) is the natural logarithm

Result:

0.998926396412216970034319887577664418332086056026253895926...

0.99892639641221697...... result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\frac{\sqrt{5}}{1+\sqrt[5]{\sqrt{\varphi^5\sqrt[4]{5^3}}-1}}-\varphi+1}=1-\frac{e^{-\pi\sqrt{5}}}{1+\frac{e^{-2\pi\sqrt{5}}}{1+\frac{e^{-3\pi\sqrt{5}}}{1+\frac{e^{-4\pi\sqrt{5}}}{1+\ldots}}}}\approx 0.9991104684$$

and to the dilaton value $\mathbf{0.989117352243} = \boldsymbol{\phi}$

And:

2*sqrt[1/log base 0.998926396412216 ((((1/((((((1.954*sqrt(17.3084)))) / ((((ln 17.3084)^2))))))))))]-Pi+1/golden ratio

Input interpretation:

$$2\sqrt{\frac{1}{\log_{0.998926396412216}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}-\pi+\frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

$\log_b(x)$ is the base- b logarithm

ϕ is the golden ratio

Result:

125.4764413352179586743591961101647426761086767734676081643...

125.4764413352…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternative representations:

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}} - \pi + \frac{1}{\phi} =$$

$$\left(-\pi + \frac{1}{\phi} + 2\sqrt{\frac{1}{\frac{\log\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}{\log(0.9989263964122160000)}}} = \right.$$

$$\left. \frac{1}{\phi} - \pi + 2\sqrt{\frac{\log(0.9989263964122160000)}{\log\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}}\right)$$

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}} - \pi + \frac{1}{\phi} =$$

$$\left(-\pi + \frac{1}{\phi} + 2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log_e^2(17.3084)}}\right)}} = \right.$$

$$\left. \frac{1}{\phi} - \pi + 2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log_e^2(17.3084)}{\sqrt{17.3084}}\right)}}\right)$$

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}-\pi+\frac{1}{\phi}=$$

$$\left(-\pi+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{(\log(a)\log_a(17.3084))^2}}\right)}}=\right.$$

$$\left.\frac{1}{\phi}-\pi+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(a)\log_a^2(17.3084)}{\sqrt{17.3084}}\right)}}\right)$$

Series representations:

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\exp\left(i\pi\left\lfloor\frac{\arg\left(-x+\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}\right)}{2\pi}\right\rfloor\right)\sqrt{x}$$

$$\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}\right)^k\left(-\frac{1}{2}\right)_k}{k!}$$

for ($x\in\mathbb{R}$ and $x<0$)

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}-z_0\right)/(2\pi)\right\rfloor\right)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}-z_0\right)^k z_0^{-k}}{k!}$$

Integral representations:

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\left(\int_1^{17.3084}\frac{1}{t}\,dt\right)^2}{\sqrt{17.3084}}\right)}}$$

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.127943\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-2.79168s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{i^2\,\pi^2\sqrt{17.3084}}\right)}}\quad\text{for } -1<\gamma<0$$

2*sqrt[1/log base 0.998926396412216 ((((1/((((((1.954*sqrt(17.3084)))) / ((((ln 17.3084)^2))))))))))]+11+1/golden ratio

Input interpretation:

$$2\sqrt{\frac{1}{\log_{0.998926396412216}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

$\log_b(x)$ is the base- b logarithm

ϕ is the golden ratio

Result:

139.6180339888077519128218394934442455603058461728427139852...

139.61803398….. result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$\left(11+\frac{1}{\phi}+2\sqrt{\frac{1}{\frac{\log\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}{\log(0.9989263964122160000)}}}=\right.$$

$$\left.11+\frac{1}{\phi}+2\sqrt{\frac{\log(0.9989263964122160000)}{\log\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}}\right)$$

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$\left(11+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log_e^2(17.3084)}}\right)}}=\right.$$

$$\left.11+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log_e^2(17.3084)}{\sqrt{17.3084}}\right)}}\right)$$

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$\left(11+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{(\log(a)\log_a(17.3084))^2}}\right)}}=\right.$$

$$\left.11+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(a)\log_a^2(17.3084)}{\sqrt{17.3084}}\right)}}\right)$$

Series representations:

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\exp\left(i\pi\left\lfloor\frac{\arg\left(-x+\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}\right)}{2\pi}\right\rfloor\right)\sqrt{x}$$

$$\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}\right)^k\left(-\frac{1}{2}\right)_k}{k!}$$

for ($x \in \mathbb{R}$ and $x < 0$)

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}-z_0\right)/(2\pi)\right\rfloor\right)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\log^2(17.3084)}{\sqrt{17.3084}}\right)}-z_0\right)^k z_0^{-k}}{k!}$$

Integral representations:

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.511771\left(\int_1^{17.3084}\frac{1}{t}\,dt\right)^2}{\sqrt{17.3084}}\right)}}$$

$$2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{1}{\frac{1.954\sqrt{17.3084}}{\log^2(17.3084)}}\right)}}+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\sqrt{\frac{1}{\log_{0.9989263964122160000}\left(\frac{0.127943\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-2.79168s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{i^2\pi^2\sqrt{17.3084}}\right)}} \quad \text{for } -1<\gamma<0$$

We have that:

(after eq. 252)

$$\phi(N) = \left\{\frac{\log(n+2)}{\log(n+1)} - 1\right\} Li\left\{\left(\frac{1}{n}\log N\right)^{n\frac{\log(n+2)}{\log(n-1)}-n}\right\}$$

$$-\frac{\left(\frac{1}{n}\log N\right)^{n\frac{\log(n+2)}{\log(n-1)}-n}}{n\log\left(\frac{1}{n}\log N\right)} - R\left(\frac{1}{n}\log N\right)+)\left\{\frac{\sqrt{(\log N)}}{(\log\log N)^3}\right\}.$$

And:

$$N = 2^5 \cdot 3^3 \cdot 5^2 \cdot 7 \cdot 11 \cdot 13.$$

Input:

$2^5 \times 3^3 \times 5^2 \times 7 \times 11 \times 13$

Result:

21621600

Scientific notation:

2.16216×10^7

For R = 1, n = 3 and N = 21621600, we obtain:

((((((ln(5)/ln(4)))-1)))) Li(((((1/3 ln(21621600)^(3*((((ln(5)/ln(3))))-3)))))

Input:

$$\left(\frac{\log(5)}{\log(4)} - 1\right) \mathrm{li}\left(\frac{1}{3}\log^{3\,(\log(5)/\log(3)-3)}(21621600)\right)$$

$\log(x)$ is the natural logarithm

$\mathrm{li}(x)$ is the logarithmic integral

Decimal approximation:

$-7.918550312975138281085838579694890949730781209501119\ldots \times 10^{-9}$

$-7.918550312975138281085838579694890949730781209501119 \times 10^{-9}$

Alternate forms:

$$\frac{\log\left(\frac{5}{4}\right) \operatorname{li}\left(\frac{1}{3} \log^{-9+(3 \log(5))/\log(3)}(21\,621\,600)\right)}{\log(4)}$$

$$-\frac{(\log(4) - \log(5)) \operatorname{li}\left(\frac{1}{3} \log^{3 (-3+\log(5)/\log(3))}(21\,621\,600)\right)}{\log(4)}$$

$$\left(\frac{\log(5)}{2 \log(2)} - 1\right) \operatorname{li}\left(\frac{1}{3} (5 \log(2) + 3 \log(3) + 2 \log(5) + \log(1001))^{-9+(3 \log(5))/\log(3)}\right)$$

Alternative representations:

$$\left(\frac{\log(5)}{\log(4)} - 1\right) \operatorname{li}\left(\frac{1}{3} \log^{3 (\log(5)/\log(3)-3)}(21\,621\,600)\right) = \operatorname{Ei}\left(\log\left(\frac{1}{3} \log^{3 (-3+\log(5)/\log(3))}(21\,621\,600)\right)\right)\left(-1 + \frac{\log_e(5)}{\log_e(4)}\right)$$

$$\left(\frac{\log(5)}{\log(4)} - 1\right) \operatorname{li}\left(\frac{1}{3} \log^{3 (\log(5)/\log(3)-3)}(21\,621\,600)\right) = \operatorname{Ei}\left(\log\left(\frac{1}{3} \log^{3 (-3+\log(5)/\log(3))}(21\,621\,600)\right)\right)\left(-1 + \frac{\log(a) \log_a(5)}{\log(a) \log_a(4)}\right)$$

$$\left(\frac{\log(5)}{\log(4)} - 1\right) \operatorname{li}\left(\frac{1}{3} \log^{3 (\log(5)/\log(3)-3)}(21\,621\,600)\right) = \operatorname{li}\left(\frac{1}{3} \log_e^{3 (-3+\log_e(5)/\log_e(3))}(21\,621\,600)\right)\left(-1 + \frac{\log_e(5)}{\log_e(4)}\right)$$

Series representations:

$$\left(\frac{\log(5)}{\log(4)} - 1\right) \operatorname{li}\left(\frac{1}{3} \log^{3 (\log(5)/\log(3)-3)}(21\,621\,600)\right) = \frac{2 \gamma \log\left(\frac{5}{4}\right)}{\log(16)} + \frac{i \pi \log\left(\frac{5}{4}\right)}{\log(16)} - \frac{\log\left(\frac{5}{4}\right) \log\left(\frac{1}{\log\left(\frac{1}{3} \log^{-9+(3 \log(5))/\log(3)}(21\,621\,600)\right)}\right)}{\log(16)} + \frac{\log\left(\frac{5}{4}\right) \log\left(-\log\left(\frac{1}{3} \log^{-9+(3 \log(5))/\log(3)}(21\,621\,600)\right)\right)}{\log(16)} + \frac{2 \log\left(\frac{5}{4}\right) \sum_{k=1}^{\infty} \frac{\log^k\left(\frac{1}{3} \log^{-9+(3 \log(5))/\log(3)}(21\,621\,600)\right)}{k\, k!}}{\log(16)}$$

$$\left(\frac{\log(5)}{\log(4)}-1\right)\operatorname{li}\left(\frac{1}{3}\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)\right)=$$
$$-\frac{2\log\left(\frac{5}{4}\right)\left(\operatorname{Res}_{s=0}\frac{\Gamma(s)\left(\frac{\log(3)}{\log^2(3)+\log\left(\frac{19683}{125}\right)\log(\log(21\,621\,600))}\right)^s}{s}\right)}{\log(16)}-\frac{2\log\left(\frac{5}{4}\right)\sum_{j=1}^{\infty}\operatorname{Res}_{s=-j}\frac{\Gamma(s)\left(\frac{\log(3)}{\log^2(3)+\log\left(\frac{19683}{125}\right)\log(\log(21\,621\,600))}\right)^s}{s}}{\log(16)}$$

$$\left(\frac{\log(5)}{\log(4)}-1\right)\operatorname{li}\left(\frac{1}{3}\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)\right)=$$
$$-\left(\left(\left(\log(3)-\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{3}\right)^k}{k}+\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)\left(2\gamma+i\pi-\log\left(\frac{1}{\log\left(\frac{1}{3}\log^{3(-3+\log(5)/\log(3))}(21\,621\,600)\right)}\right)+\log\left(-\log\left(\frac{1}{3}\log^{3(-3+\log(5)/\log(3))}(21\,621\,600)\right)\right)+2\sum_{k=1}^{\infty}\frac{\log^k\left(\frac{1}{3}\log^{-9+(3\log(5))/\log(3)}(21\,621\,600)\right)}{k\,k!}\right)\right)\Big/\left(2\left(\log(3)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{3}\right)^k}{k}\right)\right)\right)$$

Integral representations:

$$\left(\frac{\log(5)}{\log(4)}-1\right)\operatorname{li}\left(\frac{1}{3}\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)\right)=$$
$$\frac{\log\left(\frac{5}{4}\right)}{\log(4)}\int_0^{\frac{1}{3}\log^{-9+(3\log(5))/\log(3)}(21\,621\,600)}\frac{1}{\log(t)}\,dt$$

$$\left(\frac{\log(5)}{\log(4)}-1\right)\operatorname{li}\left(\frac{1}{3}\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)\right)=$$
$$-\frac{\left(\int_1^4\frac{1}{t}\,dt-\int_1^5\frac{1}{t}\,dt\right)\int_0^{\frac{1}{3}\log^{-9+(3\log(5))/\log(3)}(21\,621\,600)}\frac{1}{\log(t)}\,dt}{\int_1^4\frac{1}{t}\,dt}$$

$$\left(\frac{\log(5)}{\log(4)}-1\right)\operatorname{li}\left(\frac{1}{3}\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)\right) = \frac{i\log\left(\frac{5}{4}\right)}{\pi\log(16)}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(s)^2\left(-\log\left(\frac{1}{3}\log^{-9+(3\log(5))/\log(3)}(21\,621\,600)\right)\right)^{-s}}{\Gamma(1+s)}\,ds \quad \text{for } 0<\gamma$$

-(((1/3 ln(21621600)^((3*((ln(5)/ln(3))-3)))) / (((3ln(1/3*ln(21621600))))) – (1/3 ln(21621600))+((((sqrt(ln(21621600))))))/((((ln(ln(21621600))))))^3

Input:

$$-\left(\frac{\frac{1}{3}\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)}{3\log\left(\frac{1}{3}\log(21\,621\,600)\right)}-\frac{1}{3}\log(21\,621\,600)+\frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$-\frac{\log^{3(\log(5)/\log(3)-3)}(21\,621\,600)}{9\log\left(\frac{\log(21\,621\,600)}{3}\right)}-\frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}+\frac{\log(21\,621\,600)}{3}$$

Decimal approximation:

5.447773802891567009002511540670266419804633783231593000653...

5.447773802891567009002511540670266419804633783231593000653

Alternate forms:

$$\frac{\sqrt{\log(21\,621\,600)}\left(\sqrt{\log(21\,621\,600)}\log^3(\log(21\,621\,600))-3\right)}{3\log^3(\log(21\,621\,600))}-\frac{\log^{(3\log(5))/\log(3)-9}(21\,621\,600)}{9\log\left(\frac{\log(21\,621\,600)}{3}\right)}$$

$$\left(-9\log^{19/2}(21\,621\,600)\log\left(\frac{\log(21\,621\,600)}{3}\right)-\log^{(3\log(5))/\log(3)}(21\,621\,600)\log^3(\log(21\,621\,600))+3\log^{10}(21\,621\,600)\log\left(\frac{\log(21\,621\,600)}{3}\right)\log^3(\log(21\,621\,600))\right)\Big/\left(9\log^9(21\,621\,600)\log\left(\frac{\log(21\,621\,600)}{3}\right)\log^3(\log(21\,621\,600))\right)$$

$$-\frac{\sqrt{5\log(2)+3\log(3)+2\log(5)+\log(1001)}}{\log^3(5\log(2)+3\log(3)+2\log(5)+\log(1001))}+\frac{5\log(2)}{3}+\log(3)+\frac{2\log(5)}{3}+\frac{\log(1001)}{3}-\frac{(5\log(2)+3\log(3)+2\log(5)+\log(1001))^{(3\log(5))/\log(3)-9}}{9\log\left(\frac{1}{3}(5\log(2)+3\log(3)+2\log(5)+\log(1001))\right)}$$

Alternative representations:

$$-\left(\frac{\log^{3(\log(5)/\log(3)-3)}(21621600)}{\left(3\log\left(\frac{\log(21621600)}{3}\right)\right)3}-\frac{\log(21621600)}{3}+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)=\frac{\log_e(21621600)}{3}-\frac{\log_e^{3(-3+\log_e(5)/\log_e(3))}(21621600)}{3\left(3\log_e\left(\frac{\log(21621600)}{3}\right)\right)}-\frac{\sqrt{\log_e(21621600)}}{\log_e^3(\log(21621600))}$$

$$-\left(\frac{\log^{3(\log(5)/\log(3)-3)}(21621600)}{\left(3\log\left(\frac{\log(21621600)}{3}\right)\right)3}-\frac{\log(21621600)}{3}+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)=\frac{1}{3}\log(a)\log_a(21621600)-\frac{(\log(a)\log_a(21621600))^{3(-3+(\log(a)\log_a(5))/(\log(a)\log_a(3)))}}{3\left(3\log(a)\log_a\left(\frac{\log(21621600)}{3}\right)\right)}-\frac{\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(\log(21621600)))^3}$$

$$-\left(\frac{\log^{3(\log(5)/\log(3)-3)}(21621600)}{\left(3\log\left(\frac{\log(21621600)}{3}\right)\right)3}-\frac{\log(21621600)}{3}+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)=-\frac{\text{Li}_1(-21621599)}{3}-\frac{(-\text{Li}_1(-21621599))^{3(-3--\text{Li}_1(-4)/\text{Li}_1(-2))}}{3\left(-3\,\text{Li}_1\left(1-\frac{\log(21621600)}{3}\right)\right)}-\frac{\sqrt{-\text{Li}_1(-21621599)}}{(-\text{Li}_1(1-\log(21621600)))^3}$$

Input interpretation:

$-7.918550312975138281085838579694890949730781209501119\times10^{-9}+5.447773802891567009002511540670266419804633783231593000653$

Result:

5.447773794973016696027373259584427840109742833500811791151...

5.4477737949730166.....

(-7.918550312975138281 × 10^-9 + 5.447773802891567009)^3-18-4

Input interpretation:

$(-7.918550312975138281 \times 10^{-9} + 5.447773802891567009)^3 - 18 - 4$

Result:

139.680334454942280421194440427305292111235848808928694497 8...

139.6803344549..... result practically equal to the rest mass of Pion meson 139.57 MeV

(-7.918550312975138281 × 10^-9 + 5.447773802891567009)^3-47+11

Input interpretation:

$(-7.918550312975138281 \times 10^{-9} + 5.447773802891567009)^3 - 47 + 11$

Result:

125.680334454942280421194440427305292111235848808928694497 8...

125.68033445.... result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Now, from:

$$ddd(n) > (\log n)^{\log\log\log\log n}$$

We obtain:

((ln (3)))^(ln ln ln ln (3))

Input:

$\log^{\log(\log(\log(\log(3))))}(3)$

log(x) is the natural logarithm

Exact result:

$\log^{\log(-\log(\log(\log(3))))+i\pi}(3)$

Decimal approximation:

1.037292622746069090640523104887166107756392827049747023 3... +
0.315719433137370531012080728514215683503988328596566393 67... i

Polar coordinates:

$r \approx 1.08428$ (radius), $\theta \approx 16.9286°$ (angle)

1.08428

Alternate form:

$$\log^{\log(-\log(\log(\log(3))))}(3) \cos(\pi \log(\log(3))) + i \log^{\log(-\log(\log(\log(3))))}(3) \sin(\pi \log(\log(3)))$$

General form

$$\log^{\log(\log(\log(\log(3))))}(3) = e^{-2\pi^2 n + 2 i \pi n \log(-\log(\log(\log(3)))) + \log(\log(3)) \log(-\log(\log(\log(3)))) + i \pi \log(\log(3))} \text{ for } n \in \mathbb{Z}$$

(the choice of n is determined by the branch of the logarithm used for complex exponentiation)

Alternative representations:

$$\log^{\log(\log(\log(\log(3))))}(3) = \log^{\log(\log(3))}(\log(\log(3)))$$

$$\log^{\log(\log(\log(\log(3))))}(3) = \log_e^{\log_e(\log(\log(\log(3))))}(3)$$

$$\log^{\log(\log(\log(\log(3))))}(3) = (\log(a) \log_a(3))^{\log(a) \log_a(\log(\log(\log(3))))}$$

Series representations:

$$\log^{\log(\log(\log(\log(3))))}(3) = \left(\log(2) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{i\pi + \log(-1-\log(\log(\log(3)))) - \sum_{k=1}^{\infty} \left(\frac{1}{1+\log(\log(\log(3)))}\right)^k / k}$$

$$\log^{\log(\log(\log(\log(3))))}(3) = \left(2 i \pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-x)^k x^{-k}}{k}\right)^{i\pi + 2 i \pi \lfloor \arg(-x-\log(\log(\log(3))))/(2\pi) \rfloor + \log(x) - \sum_{k=1}^{\infty} \left((-1)^k x^{-k} (-x-\log(\log(\log(3))))^k\right)/k}$$

for $x < 0$

$$\log^{\log(\log(\log(\log(3))))}(3) = \left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-z_0)^k z_0^{-k}}{k}\right)^{i\pi + 2 i \pi \left\lfloor \left(\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)\right)/(2\pi) \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \left((-1)^k (-\log(\log(\log(3))) - z_0)^k z_0^{-k}\right)/k}$$

Integral representations:

$$\log^{\log(\log(\log(\log(3))))}(3) = \left(\int_1^3 \frac{1}{t}\,dt\right)^{i\pi + \int_1^{-\log(\log(\log(3)))} 1/t\,dt}$$

$$\log^{\log(\log(\log(\log(3))))}(3) = (2\pi)^{-i\pi + i/(2\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma} \left(\Gamma(-s)^2\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/\Gamma(1-s)\,ds} \left(-i\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{2^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{i\pi - i/(2\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma} \left(\Gamma(-s)^2\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/\Gamma(1-s)\,ds}$$

for $-1 < \gamma < 0$

[((ln (3)))^(ln ln ln ln (3))]^6 + (47/10^3)i

Input:

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{47}{10^3}\,i$$

$\log(x)$ is the natural logarithm

i is the imaginary unit

Exact result:

$$\frac{47\,i}{1000} + \log^{6\log(-\log(\log(\log(3))))+6\,i\,\pi}(3)$$

Decimal approximation:

$-0.3259535806127655849521310685046535199855794916084654645\ldots +$
$1.638920063836049724274182295374681755596340931790306841\ldots\,i$

Alternate forms:

$$\frac{47\,i}{1000} + \log^{\log\left(\log^6(\log(\log(3)))\right)+6\,i\,\pi}(3)$$

$$\frac{47\,i}{1000} + \log^{6(\log(-\log(\log(\log(3))))+i\,\pi)}(3)$$

$$\frac{47\,i + 1000\log^{6\log(-\log(\log(\log(3))))+6\,i\,\pi}(3)}{1000}$$

Alternative representations:

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{47\,i}{10^3} + \log^{\log(\log(3))}(\log(\log(3)))^6$$

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{47\,i}{10^3} + \log_e^{\log_e(\log(\log(\log(3))))}(3)^6$$

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{47\,i}{10^3} + \left((\log(a)\log_a(3))^{\log(a)\log_a(\log(\log(\log(3))))}\right)^6$$

Series representations:

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{1}{1000} \left(1000\left(\log(2) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{6 i \pi + 6\log(-1-\log(\log(\log(3))))} + 47\,i\left(\log(2) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{6\sum_{k=1}^{\infty}\left(\frac{1}{1+\log(\log(\log(3)))}\right)^k/k}\right) \left(\log(2) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{-6\sum_{k=1}^{\infty}\left(\frac{1}{1+\log(\log(\log(3)))}\right)^k/k}$$

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{1}{1000}\left(47\,i + 1000\left(\operatorname{Res}_{s=0} \frac{2^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s} + \sum_{j=1}^{\infty} \operatorname{Res}_{s=j} \frac{2^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^{6 i \pi + 6\left(\operatorname{Res}_{s=0}\left(\Gamma(-s)\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/s\right) + 6\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\left(\Gamma(-s)\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/s}\right)$$

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{1}{1000}\left(1000\left(2 i \pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-x)^k x^{-k}}{k}\right)^{6 i \pi + 12 i \pi \lfloor \arg(-x-\log(\log(\log(3))))/(2\pi)\rfloor + 6\log(x)} + 47\,i\left(2 i \pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-x)^k x^{-k}}{k}\right)^{6\sum_{k=1}^{\infty}\left((-1)^k x^{-k} (-x-\log(\log(\log(3))))^k\right)/k}\right)\left(2 i \pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-x)^k x^{-k}}{k}\right)^{-6\sum_{k=1}^{\infty}\left((-1)^k x^{-k} (-x-\log(\log(\log(3))))^k\right)/k} \quad \text{for } x < 0$$

Integral representations:

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{47\,i + 1000\left(\int_1^3 \frac{1}{t}\,dt\right)^{6\,i\,\pi + 6\int_1^{-\log(\log(\log(3)))} 1/t\,dt}}{1000}$$

$$\log^{\log(\log(\log(\log(3))))}(3)^6 + \frac{i\,47}{10^3} = \frac{1}{125} \times 2^{-3-6\,i\,\pi}\,\pi^{-6\,i\,\pi}\left(125 \times 2^{3+(3\,i)/\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \left(\Gamma(-s)^2\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/\Gamma(1-s)\,ds} \pi^{(3\,i)/\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \left(\Gamma(-s)^2\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/\Gamma(1-s)\,ds} \left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{2^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{6\,i\,\pi} + 47\,i\,(2\,\pi)^{6\,i\,\pi}\left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{2^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{(3\,i)/\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \left(\Gamma(-s)^2\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/\Gamma(1-s)\,ds}\right) \left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{2^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{-(3\,i)/\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \left(\Gamma(-s)^2\,\Gamma(1+s)\,(-1-\log(\log(\log(3))))^{-s}\right)/\Gamma(1-s)\,ds}$$

for $-1 < \gamma < 0$

The result is:

1/10^27(-0.325953580612765584952131 + 1.638920063836049724274i)

Input interpretation:

$$\frac{1}{10^{27}} \times (-0.325953580612765584952131 + 1.638920063836049724274\,i)$$

i is the imaginary unit

Result:

$-3.259535806127655849521... \times 10^{-28} + 1.638920063836049724274... \times 10^{-27}\,i$

Polar coordinates:

$r = 1.671019064032078592690 \times 10^{-27}$ (radius), $\theta = 101.24838952855295406620°$ (angle)

$1.67101906...*10^{-27}$ result practically equal to the value of the formula:

$m_{p'} = 2 \times \frac{\eta}{R} m_P = 1.6714213 \times 10^{-27}$ kg

that is the holographic proton mass (N. Haramein)

Now, we have that:

$$\sqrt{(1+a_{\lambda'})} - \sqrt{(1+a_{\lambda})} > \frac{\sqrt{(\log p_1)}}{2\lambda(\log\lambda)^{\frac{3}{2}}} - \sqrt{2}. \qquad (121)$$

for $\lambda = 5$, $\mu = 8$, $a_\lambda \leq (\ln \mu / \ln \lambda)$ and $p_1 = 7$, we obtain:

(ln(8))/(ln(5))

Input:

$$\frac{\log(8)}{\log(5)}$$

$\log(x)$ is the natural logarithm

Decimal approximation:

1.292029674220179152010319706291896896209375796239281347965...

1.29202967…

Alternate form:

$$\frac{3\log(2)}{\log(5)}$$

Alternative representations:

$$\frac{\log(8)}{\log(5)} = \frac{\log_e(8)}{\log_e(5)}$$

$$\frac{\log(8)}{\log(5)} = \frac{\log(a)\log_a(8)}{\log(a)\log_a(5)}$$

$$\frac{\log(8)}{\log(5)} = \frac{-\text{Li}_1(-7)}{-\text{Li}_1(-4)}$$

Series representations:

$$\frac{\log(8)}{\log(5)} = \frac{\log(7) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{7}\right)^k}{k}}{\log(4) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k}{k}}$$

$$\frac{\log(8)}{\log(5)} = \frac{2\pi \left\lfloor \frac{\arg(8-x)}{2\pi} \right\rfloor - i\log(x) + i\sum_{k=1}^{\infty} \frac{(-1)^k (8-x)^k x^{-k}}{k}}{2\pi \left\lfloor \frac{\arg(5-x)}{2\pi} \right\rfloor - i\log(x) + i\sum_{k=1}^{\infty} \frac{(-1)^k (5-x)^k x^{-k}}{k}} \quad \text{for } x < 0$$

$$\frac{\log(8)}{\log(5)} = \frac{2\pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty} \frac{(-1)^k (8-z_0)^k z_0^{-k}}{k}}{2\pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty} \frac{(-1)^k (5-z_0)^k z_0^{-k}}{k}}$$

Integral representations:

$$\frac{\log(8)}{\log(5)} = \frac{\int_1^8 \frac{1}{t}\,dt}{\int_1^5 \frac{1}{t}\,dt}$$

$$\frac{\log(8)}{\log(5)} = \frac{\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{7^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}{\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds} \quad \text{for } -1 < \gamma < 0$$

(((sqrt(ln(7)))) / (((2*5(ln(5))^1.5))) – sqrt2

Input:

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)} - \sqrt{2}$$

log(x) is the natural logarithm

Result:

$-1.345893\ldots$

-1.345893…

Alternative representations:

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=-\sqrt{2}+\frac{\sqrt{\log_e(7)}}{10\log_e^{1.5}(5)}$$

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=-\sqrt{2}+\frac{\sqrt{\log(a)\log_a(7)}}{10\,(\log(a)\log_a(5))^{1.5}}$$

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=-\sqrt{2}+\frac{\sqrt{-\text{Li}_1(-6)}}{10\,(-\text{Li}_1(-4))^{1.5}}$$

Series representations:

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=\sum_{k=0}^{\infty}-\frac{1}{10\,k!\log^{1.5}(5)}(-1)^k x^{-k}\left(10\,(2-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\log^{1.5}(5)-\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)(-x+\log(7))^k\right)\left(-\frac{1}{2}\right)_k\sqrt{x}\quad\text{for } (x\in\mathbb{R}\text{ and } x<0)$$

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=\sum_{k=0}^{\infty}-\frac{1}{10\,k!\log^{1.5}(5)}(-1)^k\left(-\frac{1}{2}\right)_k z_0^{1/2-k}\left(10\log^{1.5}(5)\,(2-z_0)^k\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor}-(\log(7)-z_0)^k\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\log(7)-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(\log(7)-z_0)/(2\pi)\rfloor}\right)$$

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=$$
$$-\left(\left(\sqrt{x}\left(10\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\left(\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}-\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/\left(10\left(\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)^{1.5}\right)\right)$$ for $(x\in\mathbb{R}$ and $x<0)$

Integral representations:

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=-\frac{10\left(\int_1^5\frac{1}{t}\,dt\right)^{1.5}\sqrt{2}-\sqrt{\int_1^7\frac{1}{t}\,dt}}{10\left(\int_1^5\frac{1}{t}\,dt\right)^{1.5}}$$

$$\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}=$$
$$-\frac{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{1.5}\sqrt{2}-0.282843\sqrt{\frac{1}{2i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{6^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}}{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{1.5}}$$
for $-1<\gamma<0$

sqrt(1+x) – sqrt(1+1.29202967422) > (((sqrt(ln(7))))) / (((2*5(ln(5))^1.5))) – sqrt2

Input interpretation:

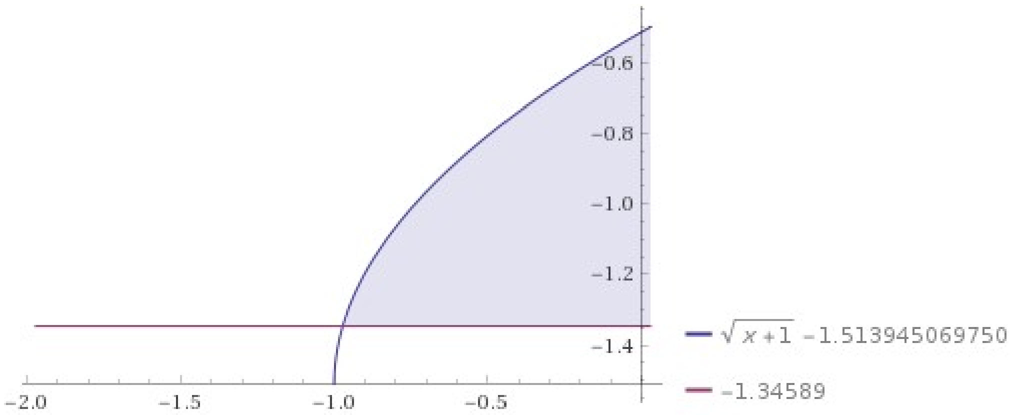
$$\sqrt{1+x}-\sqrt{1+1.29202967422}>\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}$$

log(x) is the natural logarithm

Result:

$$\sqrt{x+1}-1.513945069750>-1.34589$$

Inequality plot:



Alternate forms:

$x > -0.971759$

$\sqrt{x+1} > 0.168052$

$1.000000000000 \left(1.00000000000 \sqrt{x+1} - 1.51394506975\right) > -1.34589$

Alternate form assuming x>0:

$\sqrt{x+1} > 0.168052$

Solution:

$x > -0.971759$

sqrt(1+0.971759) – sqrt(1+1.29202967422)

Input interpretation:

$\sqrt{1+0.971759} - \sqrt{1+1.29202967422}$

Result:

$-0.109752...$

-0.109752...

We obtain:

((((((sqrt(ln(7))))) / (((2*5(ln(5))^1.5))) – sqrt2))) / (((sqrt(1+0.971759) – sqrt(1+1.29202967422))))

Input interpretation:

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.29202967422}}$$

$\log(x)$ is the natural logarithm

Result:

12.2631...

12.2631… result very near to the black hole entropy 12.1904

Alternative representations:

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}=\frac{-\sqrt{2}+\frac{\sqrt{\log_e(7)}}{10\log_e^{1.5}(5)}}{\sqrt{1.97176}-\sqrt{2.292029674220000}}$$

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}=\frac{-\sqrt{2}+\frac{\sqrt{\log(a)\log_a(7)}}{10\,(\log(a)\log_a(5))^{1.5}}}{\sqrt{1.97176}-\sqrt{2.292029674220000}}$$

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}=\frac{-\sqrt{2}+\frac{\sqrt{-\text{Li}_1(-6)}}{10\,(-\text{Li}_1(-4))^{1.5}}}{\sqrt{1.97176}-\sqrt{2.292029674220000}}$$

Series representations:

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}} = -\left(\left(\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\log^{1.5}(5)\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} - 0.1\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(\log^{1.5}(5)\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left((1.97176-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(1.97176-x)}{2\pi}\right\rfloor\right)-(2.292029674220000-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(2.292029674220000-x)}{2\pi}\right\rfloor\right)\right)\left(-\frac{1}{2}\right)_k\right)\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}} = -\left(\left(\sqrt{x}\left(10\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\left(\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} - \exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/\left(10\left(\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left((1.97176-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(1.97176-x)}{2\pi}\right\rfloor\right)-(2.292029674220000-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(2.292029674220000-x)}{2\pi}\right\rfloor\right)\right)\left(-\frac{1}{2}\right)_k\sqrt{x}\right)\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}} =$$

$$-\left(\left(10\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\left(2i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}-\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k\left(-\frac{1}{2}\right)_k}{k!}\right)\Bigg/\left(10\left(2i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left((1.97176-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(1.97176-x)}{2\pi}\right\rfloor\right)-(2.292029674220000-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(2.292029674220000-x)}{2\pi}\right\rfloor\right)\right)\left(-\frac{1}{2}\right)_k\right)\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

Integral representations:

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}} = -\frac{10\left(\int_1^5\frac{1}{t}\,dt\right)^{1.5}\sqrt{2}-\sqrt{\int_1^7\frac{1}{t}\,dt}}{10\left(\int_1^5\frac{1}{t}\,dt\right)^{1.5}\left(\sqrt{1.97176}-\sqrt{2.292029674220000}\right)}$$

$$\frac{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}} = -\frac{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{1.5}\sqrt{2}-0.282843\sqrt{\frac{1}{2i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{6^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}}{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{1.5}\left(\sqrt{1.97176}-\sqrt{2.292029674220000}\right)}$$

for $-1<\gamma<0$

And:

Input interpretation:

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.29202967422}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}$$

log(x) is the natural logarithm

Result:

0.0815456...

0.0815456…

Alternative representations:

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}=\frac{\sqrt{1.97176}-\sqrt{2.292029674220000}}{-\sqrt{2}+\frac{\sqrt{\log_e(7)}}{10\log_e^{1.5}(5)}}$$

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}=\frac{\sqrt{1.97176}-\sqrt{2.292029674220000}}{-\sqrt{2}+\frac{\sqrt{\log(a)\log_a(7)}}{10(\log(a)\log_a(5))^{1.5}}}$$

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}}=\frac{\sqrt{1.97176}-\sqrt{2.292029674220000}}{-\sqrt{2}+\frac{\sqrt{-\text{Li}_1(-6)}}{10(-\text{Li}_1(-4))^{1.5}}}$$

Series representations:

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}} = -\left(\left(10\log^{1.5}(5)\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left((1.97176-x)^k \exp\left(i\pi\left\lfloor\frac{\arg(1.97176-x)}{2\pi}\right\rfloor\right)-(2.292029674220000-x)^k \exp\left(i\pi\left\lfloor\frac{\arg(2.292029674220000-x)}{2\pi}\right\rfloor\right)\right)\left(-\frac{1}{2}\right)_k\right)\Big/\left(\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left(10(2-x)^k\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\log^{1.5}(5)-\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)(-x+\log(7))^k\right)\left(-\frac{1}{2}\right)_k\right)\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}} = -\left(\left(10\left(\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left((1.97176-x)^k \exp\left(i\pi\left\lfloor\frac{\arg(1.97176-x)}{2\pi}\right\rfloor\right)-(2.292029674220000-x)^k \exp\left(i\pi\left\lfloor\frac{\arg(2.292029674220000-x)}{2\pi}\right\rfloor\right)\right)\left(-\frac{1}{2}\right)_k\sqrt{x}\right)\Big/\left(\sqrt{x}\left(10\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\left(\log(4)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k}{k}\right)^{1.5}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}-\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}} =$$

$$-\left(\left(10\log^{1.5}(5)\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k\left(-\frac{1}{2}\right)_k z_0^{-k}\left((1.97176-z_0)^k \left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(1.97176-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(1.97176-z_0)/(2\pi)\rfloor} - (2.292029674220000-z_0)^k\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(2.292029674220000-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(2.292029674220000-z_0)/(2\pi)\rfloor}\right)\right)\Big/\left(\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k\left(-\frac{1}{2}\right)_k z_0^{-k}\left(10\log^{1.5}(5)(2-z_0)^k\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor} - (\log(7)-z_0)^k\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\log(7)-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(\log(7)-z_0)/(2\pi)\rfloor}\right)\right)\right)$$

Integral representations:

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}} = -\frac{10\left(\int_1^5\frac{1}{t}\,dt\right)^{1.5}\left(\sqrt{1.97176}-\sqrt{2.292029674220000}\right)}{10\left(\int_1^5\frac{1}{t}\,dt\right)^{1.5}\sqrt{2}-\sqrt{\int_1^7\frac{1}{t}\,dt}}$$

$$\frac{\sqrt{1+0.971759}-\sqrt{1+1.292029674220000}}{\frac{\sqrt{\log(7)}}{2\times 5\log^{1.5}(5)}-\sqrt{2}} = -\frac{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{1.5}\left(\sqrt{1.97176}-\sqrt{2.292029674220000}\right)}{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{1.5}\sqrt{2}-0.282843\sqrt{\frac{1}{2i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{6^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}}$$

for $-1<\gamma<0$

Now, we have that:

$$-\log\left\{(1-\tfrac{1}{2})(1-\tfrac{1}{3})(1-\tfrac{1}{5})\cdots\left(1-\frac{1}{p}\right)\right\} = \log\log p + \gamma + O\left(\frac{1}{\log p}\right), \qquad (177)$$

For p = 11, we obtain:

-ln((1-1/2)(1-1/3)(1-1/5)(1-1/7)(1-1/11)) = ln ln (11) + 0.5772156649 + O(1/(ln(11)))

Now:

((-ln((1-1/2)(1-1/3)(1-1/5)(1-1/7)(1-1/11))))

Input:

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right)$$

log(x) is the natural logarithm

Exact result:

$$\log\left(\frac{77}{16}\right)$$

Decimal approximation:

1.571216699613902611498367835575602757156791046078257347195...

1.5712166996…

Property:

$\log\left(\frac{77}{16}\right)$ is a transcendental number

Alternate forms:

$$\log(77) - 4\log(2)$$

$$-4\log(2) + \log(7) + \log(11)$$

Alternative representations:

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = -\log_e\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right)$$

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = -\log(a)\log_a\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right)$$

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = \text{Li}_1\left(1-\frac{1}{3}\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right)$$

Series representations:

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = \log\left(\frac{61}{16}\right) - \sum_{k=1}^{\infty} \frac{\left(-\frac{16}{61}\right)^k}{k}$$

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = 2 i \pi \left\lfloor \frac{\arg\left(\frac{77}{16}-x\right)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{77}{16}-x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = \left\lfloor \frac{\arg\left(\frac{77}{16}-z_0\right)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg\left(\frac{77}{16}-z_0\right)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{77}{16}-z_0\right)^k z_0^{-k}}{k}$$

Integral representations:

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = \int_1^{\frac{77}{16}} \frac{1}{t}\, dt$$

$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = -\frac{i}{2\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\left(\frac{16}{61}\right)^s \Gamma(-s)^2 \Gamma(1+s)}{\Gamma(1-s)}\, ds \quad \text{for } -1 < \gamma < 0$$

For *O* = x, we obtain the following equation:

((-ln((1-1/2)(1-1/3)(1-1/5)(1-1/7)(1-1/11)))) = ln ln (11) + 0.5772156649 + x(1/(ln(11)))

Input interpretation:

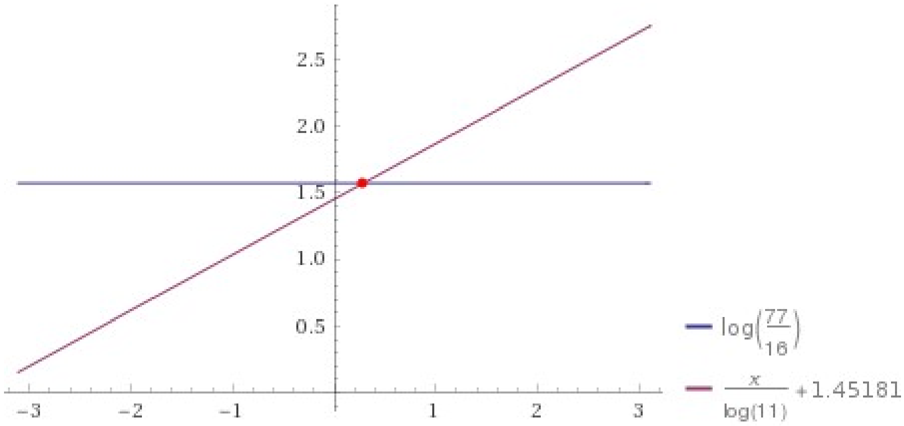
$$-\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)\left(1-\frac{1}{11}\right)\right) = \log(\log(11)) + 0.5772156649 + x \times \frac{1}{\log(11)}$$

log(x) is the natural logarithm

Result:

$$\log\left(\frac{77}{16}\right) = \frac{x}{\log(11)} + 1.45181$$

Plot:



Alternate forms:

$$\log\left(\frac{77}{16}\right) = 0.417032\,x + 1.45181$$

$$\log\left(\frac{77}{16}\right) = 0.417032\,(x + 3.48128)$$

$$0.11941 - \frac{x}{\log(11)} = 0$$

Alternate form assuming x>0:

$$-4\log(2) + \log(7) + \log(11) = \frac{x}{\log(11)} + 1.45181$$

Solution:

$$x \approx 0.286332$$

0.286332

thence:

ln ln (11) + 0.5772156649 + 0.286332(1/(ln(11)))

Input interpretation:

$$\log(\log(11)) + 0.5772156649 + 0.286332 \times \frac{1}{\log(11)}$$

log(x) is the natural logarithm

Result:

1.571216766524976218615076662164065464382893231096006263247...

1.571216766…

Alternative representations:

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = 0.577216 + \log_e(\log(11)) + \frac{0.286332}{\log_e(11)}$$

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = 0.577216 + \log(a)\log_a(\log(11)) + \frac{0.286332}{\log(a)\log_a(11)}$$

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = 0.577216 - \text{Li}_1(1-\log(11)) + -\frac{0.286332}{\text{Li}_1(-10)}$$

Series representations:

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = 0.577216 + 2 i \pi \left\lfloor \frac{\arg(-x+\log(11))}{2\pi} \right\rfloor + \log(x) + \frac{0.286332}{2 i \pi \left\lfloor \frac{\arg(11-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-x)^k x^{-k}}{k}} - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(11))^k}{k} \quad \text{for } x < 0$$

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = 0.577216 + \left\lfloor \frac{\arg(\log(11)-z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(\log(11)-z_0)}{2\pi} \right\rfloor \log(z_0) + \frac{0.286332}{\log(z_0) + \left\lfloor \frac{\arg(11-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-z_0)^k z_0^{-k}}{k}} - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(11)-z_0)^k z_0^{-k}}{k}$$

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = \left(0.286332 + 0.577216 \log(10) + \log(10) \log(-1 + \log(11)) - 0.577216 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{10}\right)^k}{k} - \log(-1 + \log(11)) \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{10}\right)^k}{k} - \log(10) \sum_{k=1}^{\infty} \frac{(-1)^k (-1 + \log(11))^{-k}}{k} + \sum_{k_1=1}^{\infty} \sum_{k_2=1}^{\infty} \frac{(-1)^{k_1+k_2} 10^{-k_1} (-1 + \log(11))^{-k_2}}{k_1 k_2}\right) \Big/ \left(\log(10) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{10}\right)^k}{k}\right)$$

Integral representations:

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = \frac{0.286332 + 0.577216 \int_1^{11} \frac{1}{t}\, dt + \int_0^1 \int_0^1 \frac{1}{(1+10 t_1)(1+(-1+\log(11)) t_2)}\, dt_2\, dt_1}{\int_1^{11} \frac{1}{t}\, dt}$$

$$\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)} = \left(0.572664 \left(i^2 \pi^2 + 1.00795\, i \pi \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{10^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds + 0.873112 \left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{10^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds\right) \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\, \Gamma(1+s)\, (-1+\log(11))^{-s}}{\Gamma(1-s)}\, ds\right)\right) \Big/ \left(i \pi \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{10^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds\right) \quad \text{for } -1 < \gamma < 0$$

We note that:

1+1/((((ln ln (11) + 0.5772156649 + 0.286332(1/(ln(11)))))))-18/10^3

Input interpretation:

$$1 + \frac{1}{\log(\log(11)) + 0.5772156649 + 0.286332 \times \frac{1}{\log(11)}} - \frac{18}{10^3}$$

log(x) is the natural logarithm

Result:

1.618449420159687368092156155396148950634541840570133136469...

1.61844942… result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternative representations:

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=1-\frac{18}{10^3}+\frac{1}{0.577216+\log_e(\log(11))+\frac{0.286332}{\log_e(11)}}$$

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=1-\frac{18}{10^3}+\frac{1}{0.577216+\log(a)\log_a(\log(11))+\frac{0.286332}{\log(a)\log_a(11)}}$$

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=1-\frac{18}{10^3}+\frac{1}{0.577216-\text{Li}_1(1-\log(11))+-\frac{0.286332}{\text{Li}_1(-10)}}$$

Series representations:

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=\frac{491}{500}+\frac{1}{0.577216+\log(-1+\log(11))+\frac{0.286332}{\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}}-\sum_{k=1}^{\infty}\frac{(-1)^k(-1+\log(11))^{-k}}{k}}$$

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=\frac{491}{500}+1\Bigg/\left(0.577216+2i\pi\left\lfloor\frac{\arg(-x+\log(11))}{2\pi}\right\rfloor+\log(x)+\frac{0.286332}{2i\pi\left\lfloor\frac{\arg(11-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-x)^k x^{-k}}{k}}-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(11))^k}{k}\right)\quad\text{for } x<0$$

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=$$

$$\frac{491}{500}+1\Bigg/\left(0.577216+\log(z_0)+\left\lfloor\frac{\arg(\log(11)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)+\frac{0.286332}{\log(z_0)+\left\lfloor\frac{\arg(11-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-z_0)^k z_0^{-k}}{k}}-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(11)-z_0)^k z_0^{-k}}{k}\right)$$

Integral representation:

$$1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}-\frac{18}{10^3}=$$

$$\left(0.982\left(i^2\pi^2+2.78618\,i\,\pi\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds+0.873112\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(11))^{-s}}{\Gamma(1-s)}\,ds\right)\right)\Bigg/\left(i^2\pi^2+1.00795\,i\,\pi\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds+0.873112\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(11))^{-s}}{\Gamma(1-s)}\,ds\right)\quad\text{for } -1<\gamma<0$$

And:

1/10^27 ((((1+1/((((ln ln (11) + 0.5772156649 + 0.286332(1/(ln(11)))))))+(29+7)/10^3))))

Input interpretation:

$$\frac{1}{10^{27}}\left(1+\frac{1}{\log(\log(11))+0.5772156649+0.286332\times\frac{1}{\log(11)}}+\frac{29+7}{10^3}\right)$$

log(x) is the natural logarithm

Result:

$1.6724494... \times 10^{-27}$

$1.6724494...*10^{-27}$ result practically equal to the proton mass in kg

Alternative representations:

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} = \frac{1+\frac{36}{10^3}+\frac{1}{0.577216+\log_e(\log(11))+\frac{0.286332}{\log_e(11)}}}{10^{27}}$$

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} = \frac{1+\frac{36}{10^3}+\frac{1}{0.577216+\log(a)\log_a(\log(11))+\frac{0.286332}{\log(a)\log_a(11)}}}{10^{27}}$$

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} = \frac{1+\frac{36}{10^3}+\frac{1}{0.577216-\text{Li}_1(1-\log(11))+-\frac{0.286332}{\text{Li}_1(-10)}}}{10^{27}}$$

Series representations:

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} = \frac{259}{250\,000\,000\,000\,000\,000\,000\,000\,000\,000} + 1\Bigg/\left(1\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(0.577216+\log(-1+\log(11))+\frac{0.286332}{\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}}-\sum_{k=1}^{\infty}\frac{(-1)^k(-1+\log(11))^{-k}}{k}\right)\right)$$

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} = \frac{259}{250\,000\,000\,000\,000\,000\,000\,000\,000\,000} + 1 \Big/ \left(1\,000\,000\,000\,000\,000\,000\,000\,000\,000 \left(0.577216 + 2\,i\,\pi \left\lfloor \frac{\arg(-x+\log(11))}{2\,\pi} \right\rfloor + \log(x) + \frac{0.286332}{2\,i\,\pi \left\lfloor \frac{\arg(11-x)}{2\,\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-x)^k x^{-k}}{k}} - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(11))^k}{k}\right)\right) \text{ for } x < 0$$

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} = \frac{259}{250\,000\,000\,000\,000\,000\,000\,000\,000\,000} + 1 \Big/ \left(1\,000\,000\,000\,000\,000\,000\,000\,000\,000 \left(0.577216 + \log(z_0) + \left\lfloor \frac{\arg(\log(11)-z_0)}{2\,\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) + \frac{0.286332}{\log(z_0) + \left\lfloor \frac{\arg(11-z_0)}{2\,\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-z_0)^k z_0^{-k}}{k}} - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(11)-z_0)^k z_0^{-k}}{k}\right)\right)$$

Integral representation:

$$\frac{1+\frac{1}{\log(\log(11))+0.577216+\frac{0.286332}{\log(11)}}+\frac{29+7}{10^3}}{10^{27}} =$$

$$\left(1.036\times 10^{-27}\, i^2\, \pi^2 + 2.79046\times 10^{-27}\, i\, \pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds + 9.04544\times 10^{-28} \left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right) \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(11))^{-s}}{\Gamma(1-s)}\, ds\right) \Big/ \left(i^2\,\pi^2 + 1.00795\, i\, \pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds + 0.873112 \left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right) \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(11))^{-s}}{\Gamma(1-s)}\, ds\right) \quad \text{for } -1 < \gamma < 0$$

1/10^52 (((((((ln ln (11) + 0.5772156649 + 0.286332(1/(ln(11))))))))-(4Pi/27)-(golden ratio)/10^4)))

Input interpretation:

$$\frac{1}{10^{52}}\left(\left(\log(\log(11)) + 0.5772156649 + 0.286332\times\frac{1}{\log(11)}\right) - 4\times\frac{\pi}{27} - \frac{\phi}{10^4}\right)$$

log(x) is the natural logarithm

ϕ is the golden ratio

Result:

$1.105634... \times 10^{-52}$

$1.105634...*10^{-52}$ result practically equal to the value of Cosmological Constant $1.1056*10^{-52}$ m^{-2}

Alternative representations:

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = \frac{0.577216 + \log_e(\log(11)) - \frac{4\pi}{27} + \frac{0.286332}{\log_e(11)} - \frac{\phi}{10^4}}{10^{52}}$$

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = \frac{0.577216 + \log(a)\log_a(\log(11)) - \frac{4\pi}{27} + \frac{0.286332}{\log(a)\log_a(11)} - \frac{\phi}{10^4}}{10^{52}}$$

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = \frac{0.577216 - \text{Li}_1(1-\log(11)) - \frac{4\pi}{27} + -\frac{0.286332}{\text{Li}_1(-10)} - \frac{\phi}{10^4}}{10^{52}}$$

Series representations:

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = -\left(\left(1.\times 10^{-56} \left(-2863.32 - 5772.16\log(10) + \phi\log(10) + 1481.48\pi\log(10) - 10\,000\log(10)\log(-1+\log(11)) + 5772.16\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k} - \phi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k} - 1481.48\pi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k} + 10\,000\log(-1+\log(11))\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k} + 10\,000\log(10)\sum_{k=1}^{\infty}\frac{(-1)^k(-1+\log(11))^{-k}}{k} - 10\,000\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,10^{-k_1}\,(-1+\log(11))^{-k_2}}{k_1 k_2}\right)\right) \middle/ \left(\log(10) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}\right)\right)$$

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = 5.77216\times 10^{-53} - \frac{\phi}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} - \frac{\pi}{67500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{i\pi \left\lfloor \frac{\arg(-x+\log(11))}{2\pi} \right\rfloor}{5\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{\log(x)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{2.86332\times 10^{-53}}{2i\pi \left\lfloor \frac{\arg(11-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-x)^k x^{-k}}{k}} - \frac{\sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(11))^k}{k}}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} \quad \text{for } x < 0$$

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = 5.77216\times 10^{-53} - \frac{\phi}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} - \frac{\pi}{67500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{\left\lfloor \frac{\arg(\log(11)-z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{\log(z_0)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{\left\lfloor \frac{\arg(\log(11)-z_0)}{2\pi} \right\rfloor \log(z_0)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{2.86332\times 10^{-53}}{\log(z_0) + \left\lfloor \frac{\arg(11-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-z_0)^k z_0^{-k}}{k}} - \frac{\sum_{k=1}^{\infty} \frac{(-1)^k (\log(11)-z_0)^k z_0^{-k}}{k}}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Integral representations:

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} = \frac{1}{\int_1^{11} \frac{1}{t}\,dt} \left(2.86332\times 10^{-53} + 5.77216\times 10^{-53} \int_1^{11} \frac{1}{t}\,dt - 1.\times 10^{-56}\,\phi \int_1^{11} \frac{1}{t}\,dt - 1.48148\times 10^{-53}\,\pi \int_1^{11} \frac{1}{t}\,dt + \int_0^1 \int_0^1 \frac{1}{(1+10\,t_1)(1+(-1+\log(11))\,t_2)}\,dt_2\,dt_1\right)$$

$$\frac{\left(\log(\log(11)) + 0.577216 + \frac{0.286332}{\log(11)}\right) - \frac{4\pi}{27} - \frac{\phi}{10^4}}{10^{52}} =$$

$$\left(5.72664\times10^{-53}\, i^2\, \pi^2 + 5.77216\times10^{-53}\, i\,\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds - 1\times10^{-56}\,\phi\, i\,\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds - 1.48148\times10^{-53}\, i\,\pi^2 \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds + 5\times10^{-53} \left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right) \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(11))^{-s}}{\Gamma(1-s)}\, ds\right) \Big/ \left(i\,\pi \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right) \text{ for } -1<\gamma<0$$

We have that:

$$= -\frac{\log p_1}{\log 2} \log\left\{(1-\tfrac{1}{2})(1-\tfrac{1}{3})\cdots\left(1-\frac{1}{\lambda}\right)\right\} + O\{\sqrt{(\log p_1 \log\log p_1)} \log\log\log p_1\}.$$

-((ln(7)/ln(2))) ln((1-1/2)(1-1/3)(1-1/5))+(((((sqrt(ln(7)ln ln(7)))ln ln ln(7)))))

Input:

$$-\frac{\log(7)}{\log(2)} \log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right) + \sqrt{\log(7)\log(\log(7))}\, \log(\log(\log(7)))$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(2)} + \sqrt{\log(7)\log(\log(7))}\, \log(\log(\log(7)))$$

Decimal approximation:

3.247545488142725567782775943872167292974537996998315914452...

3.247545488…

Alternate forms:

$$-2\log(7) + \frac{\log(7)\log(15)}{\log(2)} + \sqrt{\log(7)\log(\log(7))}\, \log(\log(\log(7)))$$

$$\frac{\log\left(\frac{15}{4}\right)\log(7)+\log(2)\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))}{\log(2)}$$

$$\frac{\sqrt{\log(7)}\left((-2\log(2)+\log(3)+\log(5))\sqrt{\log(7)}+\log(2)\sqrt{\log(\log(7))}\ \log(\log(\log(7)))\right)}{\log(2)}$$

Alternative representations:

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$
$$-\frac{\log^2(a)\log_a(7)\log_a\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log(a)\log_a(2)}+\log(a)\log_a(\log(\log(7)))\sqrt{\log^2(a)\log_a(7)\log_a(\log(7))}$$

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$
$$-\frac{\log_e(7)\log_e\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log_e(2)}+\log_e(\log(\log(7)))\sqrt{\log_e(7)\log_e(\log(7))}$$

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$
$$\frac{-\mathrm{Li}_1(-6)\,\mathrm{Li}_1\left(1+\frac{1}{3}\left(-1+\frac{1}{5}\right)\right)}{-\mathrm{Li}_1(-1)}-\mathrm{Li}_1(1-\log(\log(7)))\sqrt{\mathrm{Li}_1(-6)\,\mathrm{Li}_1(1-\log(7))}$$

Series representations:

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$
$$\frac{1}{\log(4)}\left(2\log\left(\frac{15}{4}\right)\log(7)+\log(2)\sqrt{6\log(\log(7))}\ \log(\log(\log(7)))\sum_{k=0}^{\infty}6^k\binom{-\frac{1}{2}+k}{k}\sum_{j=0}^{k}-\frac{2(-1)^j\binom{k}{j}p_{j,k}}{-1+2j}\right)$$

$$\text{for}\left(c_k=\frac{(-1)^k\log(\log(7))}{1+k}\text{ and }p_{j,0}=1\text{ and }\log(\log(7))\,p_{j,k}=\frac{\sum_{m=1}^{k}(-k+m+j\,m)\,c_m\,p_{j,k-m}}{k}\text{ and }k\in\mathbb{Z}\text{ and }k>0\right)$$

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$

$$\frac{1}{2\log(2)}\left(2\log\left(\frac{15}{4}\right)\log(7)+e^{i\pi\left\lfloor 1/2-\arg\left(\frac{1}{e}\right)/(2\pi)\right\rfloor}\log(2)\sqrt{6\log(\log(7))}\right.$$
$$\left.\log(\log(\log(7)))\sum_{k=0}^{\infty}6^k\binom{-\frac{1}{2}+k}{k}\sum_{j=0}^{k}-\frac{2(-1)^j\binom{k}{j}p_{j,k}}{-1+2j}\right)$$

for $\left(c_k=\frac{(-1)^k\log(\log(7))}{1+k}\text{ and }p_{j,0}=1\text{ and }\log(\log(7))\,p_{j,k}=\frac{\sum_{m=1}^{k}(-k+m+j\,m)\,c_m\,p_{j,k-m}}{k}\text{ and }k\in\mathbb{Z}\text{ and }k>0\right)$

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$

$$\left(\left(2i\pi\left\lfloor\frac{\arg\left(\frac{15}{4}-x\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{15}{4}-x\right)^k x^{-k}}{k}\right)\right.$$
$$\left.\left(2i\pi\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(7-x)^k x^{-k}}{k}\right)\right)\Big/$$
$$\left(2i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k}\right)+$$
$$\sqrt{\left(\left(2i\pi\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(7-x)^k x^{-k}}{k}\right)\left(2i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k}{k}\right)\right)}$$
$$\left(2i\pi\left\lfloor\frac{\arg(-x+\log(\log(7)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(7)))^k}{k}\right)$$

for $x<0$

Integral representation:

$$-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))=$$
$$\frac{4\int_0^1\int_0^1\frac{1}{(4+11t_1)(1+6t_2)}\,dt_2\,dt_1+\int_0^1\int_0^1\frac{1}{(1+t_1)(1+(-1+\log(\log(7)))t_2)}\,dt_2\,dt_1}{\int_1^2\frac{1}{t}\,dt}$$

1/10^27((((1/2[-((ln(7)/ln(2))) ln((1-1/2)(1-1/3)(1-1/5))+(((((sqrt(ln(7)ln ln(7)))ln ln ln(7)))))]+(47+2)/10^3))))

Input:

$$\frac{1}{10^{27}}\left(\frac{1}{2}\left(-\frac{\log(7)}{\log(2)}\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)+\frac{47+2}{10^3}\right)$$

log(x) is the natural logarithm

Exact result:

$$\frac{\frac{49}{1000}+\frac{1}{2}\left(\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Decimal approximation:

$1.672772744071362783891387971936083646487268998499157 9... \times 10^{-27}$

1.672772744…*10^{-27} result practically equal to the proton mass in kg

Alternate forms:

$$\frac{\frac{49}{1000}+\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(4)}+\frac{1}{2}\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{49}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\log\left(\frac{15}{4}\right)\log(7)}{2\,000\,000\,000\,000\,000\,000\,000\,000\,000\log(2)}+\frac{\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))}{2\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\frac{49}{1000}+\frac{\log\left(\frac{15}{4}\right)\log(7)+\log(2)\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))}{\log(4)}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Alternative representations:

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}} = \frac{1}{10^{27}}\left(\frac{49}{10^3}+\frac{1}{2}\left(-\frac{\log^2(a)\log_a(7)\log_a\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log(a)\log_a(2)}+\log(a)\log_a(\log(\log(7)))\sqrt{\log^2(a)\log_a(7)\log_a(\log(7))}\right)\right)$$

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}} = \frac{\frac{49}{10^3}+\frac{1}{2}\left(-\frac{\log_e(7)\log_e\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log_e(2)}+\log_e(\log(\log(7)))\sqrt{\log_e(7)\log_e(\log(7))}\right)}{10^{27}}$$

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}} = \frac{\frac{49}{10^3}+\frac{1}{2}\left(\frac{-\text{Li}_1(-6)\text{Li}_1\left(1+\frac{1}{3}\left(-1+\frac{1}{5}\right)\right)}{-\text{Li}_1(-1)}-\text{Li}_1(1-\log(\log(7)))\sqrt{\text{Li}_1(-6)\text{Li}_1(1-\log(7))}\right)}{10^{27}}$$

Series representations:

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}} = \left(49\log(2)+500\log\left(\frac{15}{4}\right)\log(7)+250\log(2)\sqrt{6\log(\log(7))}\log(\log(\log(7)))\sum_{k=0}^{\infty}6^k\binom{-\frac{1}{2}+k}{k}\sum_{j=0}^{k}-\frac{2(-1)^j\binom{k}{j}p_{j,k}}{-1+2j}\right)/(1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\log(2))$$

$$\text{for }\left(c_k=\frac{(-1)^k\log(\log(7))}{1+k}\text{ and }p_{j,0}=1\text{ and }\log(\log(7))\,p_{j,k}=\frac{\sum_{m=1}^{k}(-k+m+j\,m)\,c_m\,p_{j,k-m}}{k}\text{ and }k\in\mathbb{Z}\text{ and }k>0\right)$$

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}}=$$

$$\left(49\log(2)+500\log\left(\frac{15}{4}\right)\log(7)+250\,e^{i\pi\left\lfloor 1/2-\arg\left(\frac{1}{e}\right)/(2\pi)\right\rfloor}\log(2)\sqrt{6\log(\log(7))}\right.$$
$$\left.\log(\log(\log(7)))\sum_{k=0}^{\infty}6^k\binom{-\frac{1}{2}+k}{k}\sum_{j=0}^{k}-\frac{2(-1)^j\binom{k}{j}p_{j,k}}{-1+2j}\right)\Big/$$
$$(1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\log(2))$$

for $\left(c_k=\frac{(-1)^k\log(\log(7))}{1+k}\right.$ and $p_{j,0}=1$ and

$\left.\log(\log(7))\,p_{j,k}=\frac{\sum_{m=1}^{k}(-k+m+j\,m)\,c_m\,p_{j,k-m}}{k}\right.$ and $k\in\mathbb{Z}$ and $\left.k>0\right)$

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}}=$$

$$\left(\frac{49}{1000}+\frac{1}{2}\left(\left(\left(2i\pi\left\lfloor\frac{\arg\left(\frac{15}{4}-x\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{15}{4}-x\right)^k x^{-k}}{k}\right)\right.\right.\right.$$
$$\left.\left.\left(2i\pi\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(7-x)^k x^{-k}}{k}\right)\right)\Big/$$
$$\left(2i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k}\right)+$$
$$\sqrt{\left(\left(2i\pi\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(7-x)^k x^{-k}}{k}\right)\right.}$$
$$\left(2i\pi\left\lfloor\frac{\arg(-x+\log(7))}{2\pi}\right\rfloor+\log(x)-\right.$$
$$\left.\left.\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(7))^k}{k}\right)\right)$$
$$\left(2i\pi\left\lfloor\frac{\arg(-x+\log(\log(7)))}{2\pi}\right\rfloor+\log(x)-\right.$$
$$\left.\left.\left.\left.\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(7)))^k}{k}\right)\right)\right)\right)\Big/$$
$$1\,000\,000\,000\,000\,000\,000\,000\,000\,000 \text{ for } x<0$$

Integral representation:

$$\frac{\frac{1}{2}\left(-\frac{\log(7)\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))\right)+\frac{47+2}{10^3}}{10^{27}}=$$

$$\frac{49\int_1^2\frac{1}{t}\,dt+4\int_0^1\int_0^1\frac{1}{(4+11t_1)(1+6t_2)}\,dt_2\,dt_1+\int_0^1\int_0^1\frac{1}{(1+t_1)(1+(-1+\log(\log(7)))t_2)}\,dt_2\,dt_1}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\int_1^2\frac{1}{t}\,dt}$$

[-((ln(7)/ln(2))) ln((1-1/2)(1-1/3)(1-1/5))+(((((sqrt(ln(7)ln ln(7)))ln ln ln(7))))]^6+18+golden ratio

Input:

$$\left(-\frac{\log(7)}{\log(2)}\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))\right)^6+18+\phi$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\phi+18+\left(\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))\right)^6$$

Decimal approximation:

1192.708371242980323083269117163676486992065586995446696719...

1192.70837124… result practically equal to the rest mass of Sigma baryon 1192.642

Alternate forms:

$$18+\frac{1}{2}\left(1+\sqrt{5}\right)+\left(\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\ \log(\log(\log(7)))\right)^6$$

$$\frac{37}{2}+\frac{\sqrt{5}}{2}+\frac{\log^6\left(\frac{15}{4}\right)\log^6(7)}{\log^6(2)}+\frac{6\log^5\left(\frac{15}{4}\right)\log^{11/2}(7)\sqrt{\log(\log(7))}\log(\log(\log(7)))}{\log^5(2)}+$$
$$\log^3(7)\log^3(\log(7))\log^6(\log(\log(7)))+$$
$$\frac{15\log^2\left(\frac{15}{4}\right)\log^4(7)\log^2(\log(7))\log^4(\log(\log(7)))}{\log^2(2)}+$$
$$\frac{20\log^3\left(\frac{15}{4}\right)\log^{9/2}(7)\log^{3/2}(\log(7))\log^3(\log(\log(7)))}{\log^3(2)}+$$
$$\frac{6\log\left(\frac{15}{4}\right)\log^{7/2}(7)\log^{5/2}(\log(7))\log^5(\log(\log(7)))}{\log(2)}+$$
$$\frac{15\log^4\left(\frac{15}{4}\right)\log^5(7)\log(\log(7))\log^2(\log(\log(7)))}{\log^4(2)}$$

$$\phi+\frac{1}{\log^6(2)}\Big(6\log(2)\log^{11/2}(7)(2\log(2)-\log(15))^4(\log(15)-2\log(2))$$
$$\sqrt{\log(\log(7))}\log(\log(\log(7)))+2\log^6(2)\left(9+32\log^6(7)\right)+$$
$$\log^6(7)\log^6(15)-192\log^5(2)\log^6(7)\log(15)-12\log(2)\log^6(7)\log^5(15)-$$
$$160\log^3(2)\log^6(7)\log^3(15)+\log^6(2)\log^3(7)\log^3(\log(7))\log^6(\log(\log(7)))+$$
$$15\log^2(2)\log^5(7)(2\log(2)-\log(15))^4\log(\log(7))\log^2(\log(\log(7)))+$$
$$15\log^4(2)\log^4(7)(2\log(2)-\log(15))^2\log^2(\log(7))\log^4(\log(\log(7)))+20\log^3(2)$$
$$\log^{9/2}(7)(2\log(2)-\log(15))^2(\log(15)-2\log(2))\log^{3/2}(\log(7))\log^3(\log(\log(7)))+$$
$$6\log^5(2)\log^{7/2}(7)(\log(15)-2\log(2))\log^{5/2}(\log(7))\log^5(\log(\log(7)))+$$
$$240\log^4(2)\log^6(7)\log^2(15)+60\log^2(2)\log^6(7)\log^4(15)\Big)$$

Alternative representations:

$$\left(-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\log(\log(\log(7)))\right)^6+18+\phi=$$
$$18+\phi+\left(-\frac{\log_e(7)\log_e\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log_e(2)}+\log_e(\log(\log(7)))\sqrt{\log_e(7)\log_e(\log(7))}\right)^6$$

$$\left(-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\log(\log(\log(7)))\right)^6+18+\phi=$$
$$18+\phi+\left(-\frac{\log^2(a)\log_a(7)\log_a\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log(a)\log_a(2)}+\right.$$
$$\left.\log(a)\log_a(\log(\log(7)))\sqrt{\log^2(a)\log_a(7)\log_a(\log(7))}\right)^6$$

$$\left(-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6+18+\phi=$$

$$18+\phi+\left(\frac{-\text{Li}_1(-6)\,\text{Li}_1\left(1+\frac{1}{3}\left(-1+\frac{1}{5}\right)\right)}{-\text{Li}_1(-1)}-\text{Li}_1(1-\log(\log(7)))\sqrt{\text{Li}_1(-6)\,\text{Li}_1(1-\log(7))}\right)^6$$

[-((ln(7)/ln(2))) ln((1-1/2)(1-1/3)(1-1/5))+(((((sqrt(ln(7)ln ln(7)))ln ln ln(7)))))]^6-199+47-golden ratio

Input:

$$\left(-\frac{\log(7)}{\log(2)}\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6-199+47-\phi$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$-\phi-152+\left(\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6$$

Decimal approximation:

1019.472303265480533386859943494945210756624968635835170994...

1019.472303… result practically equal to the rest mass of Phi meson 1019.445

Alternate forms:

$$\frac{1}{2}\left(-305-\sqrt{5}\right)+\left(\frac{\log\left(\frac{15}{4}\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6$$

$$-\frac{305}{2}-\frac{\sqrt{5}}{2}+\frac{\log^6\left(\frac{15}{4}\right)\log^6(7)}{\log^6(2)}+\frac{6\log^5\left(\frac{15}{4}\right)\log^{11/2}(7)\sqrt{\log(\log(7))}\,\log(\log(\log(7)))}{\log^5(2)}+$$
$$\log^3(7)\log^3(\log(7))\log^6(\log(\log(7)))+$$
$$\frac{15\log^2\left(\frac{15}{4}\right)\log^4(7)\log^2(\log(7))\log^4(\log(\log(7)))}{\log^2(2)}+$$
$$\frac{20\log^3\left(\frac{15}{4}\right)\log^{9/2}(7)\log^{3/2}(\log(7))\log^3(\log(\log(7)))}{\log^3(2)}+$$
$$\frac{6\log\left(\frac{15}{4}\right)\log^{7/2}(7)\log^{5/2}(\log(7))\log^5(\log(\log(7)))}{\log(2)}+$$
$$\frac{15\log^4\left(\frac{15}{4}\right)\log^5(7)\log(\log(7))\log^2(\log(\log(7)))}{\log^4(2)}$$

$$-\frac{1}{2\log^6(2)}\Bigg(305\log^6(2)+\sqrt{5}\,\log^6(2)-2\log^6\left(\frac{15}{4}\right)\log^6(7)-12\log(2)\log^5\left(\frac{15}{4}\right)\log^{11/2}(7)$$
$$\sqrt{\log(\log(7))}\,\log(\log(\log(7)))-2\log^6(2)\log^3(7)\log^3(\log(7))\log^6(\log(\log(7)))-$$
$$30\log^4(2)\log^2\left(\frac{15}{4}\right)\log^4(7)\log^2(\log(7))\log^4(\log(\log(7)))-$$
$$40\log^3(2)\log^3\left(\frac{15}{4}\right)\log^{9/2}(7)\log^{3/2}(\log(7))\log^3(\log(\log(7)))-$$
$$12\log^5(2)\log\left(\frac{15}{4}\right)\log^{7/2}(7)\log^{5/2}(\log(7))\log^5(\log(\log(7)))-$$
$$30\log^2(2)\log^4\left(\frac{15}{4}\right)\log^5(7)\log(\log(7))\log^2(\log(\log(7)))\Bigg)$$

Alternative representations:

$$\left(-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6-199+47-$$
$$\phi=-152-\phi+\left(-\frac{\log_e(7)\log_e\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log_e(2)}+\log_e(\log(\log(7)))\sqrt{\log_e(7)\log_e(\log(7))}\right)^6$$

$$\left(-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6-$$
$$199+47-\phi=-152-\phi+\left(-\frac{\log^2(a)\log_a(7)\log_a\left(\frac{1}{3}\left(1-\frac{1}{5}\right)\right)}{\log(a)\log_a(2)}+\right.$$
$$\left.\log(a)\log_a(\log(\log(7)))\sqrt{\log^2(a)\log_a(7)\log_a(\log(7))}\right)^6$$

$$\left(-\frac{\log\left(\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\right)\log(7)}{\log(2)}+\sqrt{\log(7)\log(\log(7))}\,\log(\log(\log(7)))\right)^6-$$

$$199+47-\phi=-152-\phi+$$
$$\left(\frac{-\mathrm{Li}_1(-6)\,\mathrm{Li}_1\left(1+\frac{1}{3}\left(-1+\frac{1}{5}\right)\right)}{-\mathrm{Li}_1(-1)}-\mathrm{Li}_1(1-\log(\log(7)))\sqrt{\mathrm{Li}_1(-6)\,\mathrm{Li}_1(1-\log(7))}\right)^6$$

Now, we have that:

$$Li\{\log N-(\log N)^{|log(\frac{3}{2})/\log 2}\}+O(\log N)^{\frac{5}{12}}\}$$
$$=Li(\log N)-\frac{(\log N)^{\log(\frac{3}{2})/\log 2}}{\log\log N}+O\left\{\frac{(\log N)^{\frac{5}{12}}}{\log\log N}\right\}+O\left\{\frac{(\log N)^{\{2\log(\frac{3}{2})/\log 2\}-1}}{(\log\log N)^2}\right\}$$
$$=Li(\log N)-\frac{(\log N)^{\log(\frac{3}{2})/\log 2}}{\log\log N}+O(\log N)^{\frac{5}{12}};$$

For N = 21621600, we obtain:

Li(ln(21621600))-((ln(21621600))^(ln(1.5)/ln(2)))/((ln(ln(21621600))))+(ln(21621600))^(5/12)

Input:

$$\mathrm{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)$$

$\log(x)$ is the natural logarithm

$\mathrm{li}(x)$ is the logarithmic integral

Result:

10.2359...

10.2359…

Alternative representations:

$$\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600) = -\Gamma(0, -\log(\log(21\,621\,600))) - \log(-\log(\log(21\,621\,600))) + \frac{1}{2}\left(\log(\log(\log(21\,621\,600))) - \log\left(\frac{1}{\log(\log(21\,621\,600))}\right)\right) + \log^{5/12}(21\,621\,600) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}$$

$$\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600) = \mathrm{li}(\log_e(21\,621\,600)) + \log_e^{5/12}(21\,621\,600) - \frac{\log_e^{\log_e(1.5)/\log_e(2)}(21\,621\,600)}{\log_e(\log(21\,621\,600))}$$

$$\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600) = \mathrm{Ei}(\log(\log(21\,621\,600))) + \log_e^{5/12}(21\,621\,600) - \frac{\log_e^{\log_e(1.5)/\log_e(2)}(21\,621\,600)}{\log_e(\log(21\,621\,600))}$$

Series representations:

$$\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600) = \gamma + \log^{5/12}(21\,621\,600) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \frac{1}{2}\log\left(\frac{1}{\log(\log(21\,621\,600))}\right) + \frac{1}{2}\log(\log(\log(21\,621\,600))) + \sum_{k=1}^{\infty}\frac{\log^k(\log(21\,621\,600))}{k\,k!}$$

$$\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600) = \left(-2\log^{\log(1.5)/\log(2)}(21\,621\,600) + 2\gamma\log(\log(21\,621\,600)) + 2\log^{5/12}(21\,621\,600)\log(\log(21\,621\,600)) - \log\left(\frac{1}{-1+\log(21\,621\,600)}\right)\log(\log(21\,621\,600)) + \log(-1+\log(21\,621\,600))\log(\log(21\,621\,600)) + 2\log(\log(21\,621\,600))\sum_{k=0}^{\infty}\frac{(-1)^k\,(1-\log(21\,621\,600))^{1+k}\sum_{j=1}^{1+k}\frac{B_j\,S_k^{(-1+j)}}{j}}{(1+k)!}\right)\Big/(2\log(\log(21\,621\,600)))$$

$$\mathrm{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600) = \log^{5/12}(21621600) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \frac{1}{2}\log\left(\frac{1}{\log(\log(21621600))}\right) - \log(-\log(\log(21621600))) + \frac{1}{2}\log(\log(\log(21621600))) - \mathrm{Res}_{s=0}\frac{\Gamma(s)(-\log(\log(21621600)))^{-s}}{s} - \sum_{j=1}^{\infty}\mathrm{Res}_{s=-j}\frac{\Gamma(s)(-\log(\log(21621600)))^{-s}}{s}$$

Integral representations:

$$\mathrm{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600) = \int_0^{\log(21621600)}\frac{1}{\log(t)}\,dt + \log^{5/12}(21621600) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}$$

$$\mathrm{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600) = \frac{1}{\int_1^{\log(21621600)}\frac{1}{t}\,dt}\left(-\left(\int_1^{21621600}\frac{1}{t}\,dt\right)^{\left(\int_1^{1.5}\frac{1}{t}\,dt\right)/\left(\int_1^{2}\frac{1}{t}\,dt\right)} + \left(\int_1^{21621600}\frac{1}{t}\,dt\right)^{5/12}\int_1^{\log(21621600)}\frac{1}{t}\,dt + \int_0^1\int_0^1\frac{1}{\log(\log(21621600)\,t_2)\,(1+(-1+\log(21621600))\,t_1)}\,dt_2\,dt_1\right)$$

$$\mathrm{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600) =$$

$$\left(2^{-1-\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\Big/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} \left(-4 i\pi \left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{21621599^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\Big/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} + 2^{7/12+\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\Big/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} \left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{21621599^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{5/12} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds + 2^{1+\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\Big/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} \left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds\right) \int_0^{\log(21621600)} \frac{1}{\log(t)}\,dt\right)\right) \Big/ \left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds\right) \text{ for } -1 < \gamma < 0$$

2Pi+(((Li(ln(21621600))-((ln(21621600))^(ln(1.5)/ln(2)))/((ln(ln(21621600))))+(ln(21621600))^(5/12))))

Input:

$$2\pi + \left(\mathrm{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right)$$

$\log(x)$ is the natural logarithm

$\mathrm{li}(x)$ is the logarithmic integral

Result:

16.5191…

16.5191… result very near to the black hole entropy 16.8741 and to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Alternative representations:

$$2\pi + \left(\text{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right) = 2\pi - \Gamma(0, -\log(\log(21621600))) - \log(-\log(\log(21621600))) + \frac{1}{2}\left(\log(\log(\log(21621600))) - \log\left(\frac{1}{\log(\log(21621600))}\right)\right) + \log^{5/12}(21621600) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}$$

$$2\pi + \left(\text{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right) = 2\pi + \text{li}(\log_e(21621600)) + \log_e^{5/12}(21621600) - \frac{\log_e^{\log_e(1.5)/\log_e(2)}(21621600)}{\log_e(\log(21621600))}$$

$$2\pi + \left(\text{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right) = 2\pi + \text{Ei}(\log(\log(21621600))) + \log_e^{5/12}(21621600) - \frac{\log_e^{\log_e(1.5)/\log_e(2)}(21621600)}{\log_e(\log(21621600))}$$

Series representations:

$$2\pi + \left(\text{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right) = \gamma + 2\pi + \log^{5/12}(21621600) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \frac{1}{2}\log\left(\frac{1}{\log(\log(21621600))}\right) + \frac{1}{2}\log(\log(\log(21621600))) + \sum_{k=1}^{\infty}\frac{\log^k(\log(21621600))}{k\,k!}$$

$$2\pi + \left(\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600)\right) =$$
$$\left(-2\log^{\log(1.5)/\log(2)}(21\,621\,600) + 2\gamma\log(\log(21\,621\,600)) + 4\pi\log(\log(21\,621\,600)) + 2\log^{5/12}(21\,621\,600)\log(\log(21\,621\,600)) - \log\left(\frac{1}{-1+\log(21\,621\,600)}\right)\log(\log(21\,621\,600)) + \log(-1+\log(21\,621\,600))\log(\log(21\,621\,600)) + 2\log(\log(21\,621\,600))\sum_{k=0}^{\infty}\frac{(-1)^k\,(1-\log(21\,621\,600))^{1+k}\,\sum_{j=1}^{1+k}\frac{B_j\,S_k^{(-1+j)}}{j}}{(1+k)!}\right) \Big/ (2\log(\log(21\,621\,600)))$$

$$2\pi + \left(\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600)\right) =$$
$$2\pi + \log^{5/12}(21\,621\,600) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \frac{1}{2}\log\left(\frac{1}{\log(\log(21\,621\,600))}\right) - \log(-\log(\log(21\,621\,600))) + \frac{1}{2}\log(\log(\log(21\,621\,600))) - \mathrm{Res}_{s=0}\frac{\Gamma(s)\,(-\log(\log(21\,621\,600)))^{-s}}{s} - \sum_{j=1}^{\infty}\mathrm{Res}_{s=-j}\frac{\Gamma(s)\,(-\log(\log(21\,621\,600)))^{-s}}{s}$$

Integral representations:

$$2\pi + \left(\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600)\right) =$$
$$2\pi + \int_0^{\log(21\,621\,600)}\frac{1}{\log(t)}\,dt + \log^{5/12}(21\,621\,600) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}$$

$$2\pi + \left(\mathrm{li}(\log(21\,621\,600)) - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \log^{5/12}(21\,621\,600)\right) =$$
$$\frac{1}{\int_1^{\log(21\,621\,600)}\frac{1}{t}\,dt}\left(-\left(\int_1^{21\,621\,600}\frac{1}{t}\,dt\right)^{\left(\int_1^{1.5}\frac{1}{t}\,dt\right)/\left(\int_1^{2}\frac{1}{t}\,dt\right)} + 2\pi\int_1^{\log(21\,621\,600)}\frac{1}{t}\,dt + \left(\int_1^{21\,621\,600}\frac{1}{t}\,dt\right)^{5/12}\int_1^{\log(21\,621\,600)}\frac{1}{t}\,dt + \int_0^1\int_0^1\frac{1}{\log(\log(21\,621\,600)\,t_2)\,(1+(-1+\log(21\,621\,600))\,t_1)}\,dt_2\,dt_1\right)$$

$$2\pi + \left(\operatorname{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right) =$$

$$\left(2^{-1-\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)}\right.$$

$$\left(-4\,i\,\pi\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{21621599^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} +\right.$$

$$2^{2+\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)}\,\pi \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds +$$

$$2^{7/12+\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} \left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{21621599^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^{5/12} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds +$$

$$2^{1+\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{0.693147 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)/\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)} \left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds\right)$$

$$\left.\left.\int_0^{\log(21621600)} \frac{1}{\log(t)}\,dt\right)\right) \Big/$$

$$\left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)\,(-1+\log(21621600))^{-s}}{\Gamma(1-s)}\,ds\right) \text{ for } -1 < \gamma < 0$$

7*((((2Pi+(((Li(ln(21621600))-((ln(21621600))^(ln(1.5)/ln(2)))/((ln(ln(21621600))))+(ln(21621600))^(5/12)))))))+11-golden ratio

Input:

$$7\left(2\pi + \left(\operatorname{li}(\log(21621600)) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \log^{5/12}(21621600)\right)\right) + 11 - \phi$$

$\log(x)$ is the natural logarithm

$\mathrm{li}(x)$ is the logarithmic integral

ϕ is the golden ratio

Result:

125.016…

125.016… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternative representations:

$$7\left(2\pi+\left(\mathrm{li}(\log(21621600))-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\log^{5/12}(21621600)\right)\right)+11-\phi=11-\phi+7\left(2\pi-\Gamma(0,-\log(\log(21621600)))-\log(-\log(\log(21621600)))+\frac{1}{2}\left(\log(\log(\log(21621600)))-\log\left(\frac{1}{\log(\log(21621600))}\right)\right)+\log^{5/12}(21621600)-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}\right)$$

$$7\left(2\pi+\left(\mathrm{li}(\log(21621600))-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\log^{5/12}(21621600)\right)\right)+11-\phi=11-\phi+7\left(2\pi+\mathrm{li}(\log_e(21621600))+\log_e^{5/12}(21621600)-\frac{\log_e^{\log_e(1.5)/\log_e(2)}(21621600)}{\log_e(\log(21621600))}\right)$$

$$7\left(2\pi+\left(\mathrm{li}(\log(21621600))-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\log^{5/12}(21621600)\right)\right)+11-\phi=11-\phi+7\left(2\pi+\mathrm{Ei}(\log(\log(21621600)))+\log_e^{5/12}(21621600)-\frac{\log_e^{\log_e(1.5)/\log_e(2)}(21621600)}{\log_e(\log(21621600))}\right)$$

Series representations:

$$7\left(2\pi+\left(\text{li}(\log(21621600))-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\log^{5/12}(21621600)\right)\right)+$$
$$11-\phi=11+7\gamma-\phi+14\pi+7\log^{5/12}(21621600)-\frac{7\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\frac{7}{2}\log\left(\frac{1}{\log(\log(21621600))}\right)+\frac{7}{2}\log(\log(\log(21621600)))+7\sum_{k=1}^{\infty}\frac{\log^k(\log(21621600))}{k\,k!}$$

$$7\left(2\pi+\left(\text{li}(\log(21621600))-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\log^{5/12}(21621600)\right)\right)+$$
$$11-\phi=\left(-14\log^{\log(1.5)/\log(2)}(21621600)+22\log(\log(21621600))+14\gamma\log(\log(21621600))-2\phi\log(\log(21621600))+28\pi\log(\log(21621600))+14\log^{5/12}(21621600)\log(\log(21621600))-7\log\left(\frac{1}{-1+\log(21621600)}\right)\log(\log(21621600))+7\log(-1+\log(21621600))\log(\log(21621600))+14\log(\log(21621600))\sum_{k=0}^{\infty}\frac{(-1)^k(1-\log(21621600))^{1+k}\sum_{j=1}^{1+k}\frac{B_j S_k^{(-1+j)}}{j}}{(1+k)!}\right)\Big/(2\log(\log(21621600)))$$

$$7\left(2\pi+\left(\text{li}(\log(21621600))-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\log^{5/12}(21621600)\right)\right)+11-$$
$$\phi=11-\phi+14\pi+7\log^{5/12}(21621600)-\frac{7\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\frac{7}{2}\log\left(\frac{1}{\log(\log(21621600))}\right)-7\log(-\log(\log(21621600)))+\frac{7}{2}\log(\log(\log(21621600)))-7\left(\text{Res}_{s=0}\frac{\Gamma(s)(-\log(\log(21621600)))^{-s}}{s}\right)-7\sum_{j=1}^{\infty}\text{Res}_{s=-j}\frac{\Gamma(s)(-\log(\log(21621600)))^{-s}}{s}$$

7*((((2Pi+(((Li(ln(21621600))-((ln(21621600))^(ln(1.5)/ln(2)))/((ln(ln(21621600))))+(ln(21621600))^(5/12)))))))+29-Pi-golden ratio

Input:

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+29-\pi-\phi$$

$\log(x)$ is the natural logarithm

$\text{li}(x)$ is the logarithmic integral

ϕ is the golden ratio

Result:

139.874...

139.874… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+29-\pi-\phi=29-\phi-\pi+7\left(2\pi-\Gamma(0,-\log(\log(21\,621\,600)))-\log(-\log(\log(21\,621\,600)))+\frac{1}{2}\left(\log(\log(\log(21\,621\,600)))-\log\left(\frac{1}{\log(\log(21\,621\,600))}\right)\right)+\log^{5/12}(21\,621\,600)-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}\right)$$

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+29-\pi-\phi=29-\phi-\pi+7\left(2\pi+\text{li}(\log_e(21\,621\,600))+\log_e^{5/12}(21\,621\,600)-\frac{\log_e^{\log_e(1.5)/\log_e(2)}(21\,621\,600)}{\log_e(\log(21\,621\,600))}\right)$$

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+29-\pi-\phi=29-\phi-\pi+7\left(2\pi+\text{Ei}(\log(\log(21\,621\,600)))+\log_e^{5/12}(21\,621\,600)-\frac{\log_e^{\log_e(1.5)/\log_e(2)}(21\,621\,600)}{\log_e(\log(21\,621\,600))}\right)$$

Series representations:

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+$$
$$29-\pi-\phi=29+7\gamma-\phi+13\pi+7\log^{5/12}(21\,621\,600)-$$
$$\frac{7\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}-\frac{7}{2}\log\left(\frac{1}{\log(\log(21\,621\,600))}\right)+$$
$$\frac{7}{2}\log(\log(\log(21\,621\,600)))+7\sum_{k=1}^{\infty}\frac{\log^k(\log(21\,621\,600))}{k\,k!}$$

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+$$
$$29-\pi-\phi=\left(-14\log^{\log(1.5)/\log(2)}(21\,621\,600)+58\log(\log(21\,621\,600))+\right.$$
$$14\gamma\log(\log(21\,621\,600))-2\phi\log(\log(21\,621\,600))+$$
$$26\pi\log(\log(21\,621\,600))+14\log^{5/12}(21\,621\,600)\log(\log(21\,621\,600))-$$
$$7\log\left(\frac{1}{-1+\log(21\,621\,600)}\right)\log(\log(21\,621\,600))+$$
$$7\log(-1+\log(21\,621\,600))\log(\log(21\,621\,600))+14\log(\log(21\,621\,600))$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\,(1-\log(21\,621\,600))^{1+k}\,\sum_{j=1}^{1+k}\frac{B_j\,S_k^{(-1+j)}}{j}}{(1+k)!}\right)\Big/\,(2\log(\log(21\,621\,600)))$$

$$7\left(2\pi+\left(\text{li}(\log(21\,621\,600))-\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}+\log^{5/12}(21\,621\,600)\right)\right)+29-$$
$$\pi-\phi=29-\phi+13\pi+7\log^{5/12}(21\,621\,600)-\frac{7\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))}-$$
$$\frac{7}{2}\log\left(\frac{1}{\log(\log(21\,621\,600))}\right)-7\log(-\log(\log(21\,621\,600)))+$$
$$\frac{7}{2}\log(\log(\log(21\,621\,600)))-7\left(\text{Res}_{s=0}\,\frac{\Gamma(s)\,(-\log(\log(21\,621\,600)))^{-s}}{s}\right)-$$
$$7\sum_{j=1}^{\infty}\text{Res}_{s=-j}\,\frac{\Gamma(s)\,(-\log(\log(21\,621\,600)))^{-s}}{s}$$

From:

$$\log D(N)=\log 2\cdot Li(\log N)+\log(\tfrac{3}{2})Li\{(\log n)^{\log(\frac{3}{2})\log 2}\}$$
$$-\log 2\frac{(\log N)^{\log(\frac{3}{2})/\log 2}}{\log\log N}-\log 2.R(\log N)+O\left\{\frac{\sqrt{(\log N)}}{(\log\log N)^3}\right\}. \qquad (235)$$

For R = 1, n = 3 and N = 21621600, we obtain:

ln(2) * Li(ln(21621600))+ln(1.5)Li((ln(3))^(ln(1.5)ln(2)) –
ln(2)*(((ln(21621600)^((ln(1.5)/(ln(2))))/((ln(ln(21621600)))-
ln(2)*(ln(21621600))+(((((sqrt(ln(21621600))))/(((ln(ln(21621600))^3)))

ln(2) * Li(ln(21621600))+ln(1.5)Li((ln(3))^(ln(1.5)ln(2)))

Input:

$$\log(2)\, \text{li}(\log(21\,621\,600)) + \log(1.5)\, \text{li}\left(\log^{\log(1.5)\log(2)}(3)\right)$$

log(x) is the natural logarithm

li(x) is the logarithmic integral

Result:

4.897258078969881864501895621153137289856846183658961212908...

4.897258078969881864 5…

4.897258078969881864 5 –
ln(2)*(((ln(21621600)^((ln(1.5)/(ln(2)))))))/((ln(ln(21621600))))-
ln(2)*(ln(21621600))+(((((sqrt(ln(21621600))))/(((ln(ln(21621600))^3))))))

Input interpretation:

$$4.8972580789698818645 - \log(2) \times \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(2)\log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}$$

log(x) is the natural logarithm

Result:

−7.90880...

-7.90880…

Alternative representations:

$$4.897258078969881864500000 - \frac{\log(2) \log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(2) \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} = 4.897258078969881864500000 - \log_e(2) \log_e(21\,621\,600) - \frac{\log_e(2) \log_e^{\log_e(1.5)/\log_e(2)}(21\,621\,600)}{\log_e(\log(21\,621\,600))} + \frac{\sqrt{\log_e(21\,621\,600)}}{\log_e^3(\log(21\,621\,600))}$$

$$4.897258078969881864500000 - \frac{\log(2) \log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(2) \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} = 4.897258078969881864500000 - \log^2(a) \log_a(2) \log_a(21\,621\,600) - \frac{\log(a) \log_a(2) (\log(a) \log_a(21\,621\,600))^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a) \log_a(\log(21\,621\,600))} + \frac{\sqrt{\log(a) \log_a(21\,621\,600)}}{(\log(a) \log_a(\log(21\,621\,600)))^3}$$

$$4.897258078969881864500000 - \frac{\log(2) \log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(2) \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} = 4.897258078969881864500000 - \mathrm{Li}_1(-21\,621\,599)\, \mathrm{Li}_1(-1) + -\frac{\mathrm{Li}_1(-1) (-\mathrm{Li}_1(-21\,621\,599))^{(-\mathrm{Li}_1(-0.5))/(-\mathrm{Li}_1(-1))}}{\mathrm{Li}_1(1 - \log(21\,621\,600))} + \frac{\sqrt{-\mathrm{Li}_1(-21\,621\,599)}}{(-\mathrm{Li}_1(1 - \log(21\,621\,600)))^3}$$

Series representations:

$$4.897258078969881864500000 - \frac{\log(2) \log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(2) \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} = 4.897258078969881864500000 - \log(2) \log(21\,621\,600) - \frac{\log(2) \log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \frac{\sqrt{-1 + \log(21\,621\,600)} \sum_{k=0}^{\infty} \binom{\frac{1}{2}}{k} (-1 + \log(21\,621\,600))^{-k}}{\log^3(\log(21\,621\,600))}$$

$$4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))} =$$

$$4.8972580789698818645000 - \log(2)\log(21621600) - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \frac{\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k\left(-\frac{1}{2}\right)_k}{k!}}{\log^3(\log(21621600))}$$

for ($x \in \mathbb{R}$ and $x < 0$)

$$4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))} = 4.8972580789698818645000 - \log(2)\log(21621600) - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \left(\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\log(21621600)-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(\log(21621600)-z_0)/(2\pi)\rfloor)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\log(21621600)-z_0)^k z_0^{-k}}{k!}\right) \Big/ \log^3(\log(21621600))$$

2*(((((4.8972580789698818645 – ln(2)*(((ln(21621600)^((ln(1.5)/(ln(2)))))))/((ln(ln(21621600))))- ln(2)*(ln(21621600))+(((((sqrt(ln(21621600))))/(((ln(ln(21621600))^3))))))))))))^2+1/ golden ratio

Input interpretation:

$$2\left(4.8972580789698818645 - \log(2)\times\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Result:

125.716...

125.716… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternative representations:

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + \frac{1}{\phi} = \frac{1}{\phi} + 2\left(4.8972580789698818645000 - \log_e(2)\log_e(21621600) - \frac{\log_e(2)\log_e^{\log_e(1.5)/\log_e(2)}(21621600)}{\log_e(\log(21621600))} + \frac{\sqrt{\log_e(21621600)}}{\log_e^3(\log(21621600))}\right)^2$$

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + \frac{1}{\phi} = \frac{1}{\phi} + 2\left(4.8972580789698818645000 - \log^2(a)\log_a(2)\log_a(21621600) - \frac{\log(a)\log_a(2)\left(\log(a)\log_a(21621600)\right)^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a)\log_a(\log(21621600))} + \frac{\sqrt{\log(a)\log_a(21621600)}}{\left(\log(a)\log_a(\log(21621600))\right)^3}\right)^2$$

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + \frac{1}{\phi} = \frac{1}{\phi} + 2\left(4.8972580789698818645000 - \text{Li}_1(-21621599)\text{Li}_1(-1) + -\frac{\text{Li}_1(-1)\left(-\text{Li}_1(-21621599)\right)^{(-\text{Li}_1(-0.5))/(-\text{Li}_1(-1))}}{\text{Li}_1(1-\log(21621600))} + \frac{\sqrt{-\text{Li}_1(-21621599)}}{\left(-\text{Li}_1(1-\log(21621600))\right)^3}\right)^2$$

Series representations:

$$2\left(4.89725807896988186450000-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(2)\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2+\frac{1}{\phi}=$$

$$\frac{1}{\phi}+2\left(-4.89725807896988186450000+\log(2)\log(21621600)+\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\frac{\sqrt{-1+\log(21621600)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}(-1+\log(21621600))^{-k}}{\log^3(\log(21621600))}\right)^2$$

$$2\left(4.89725807896988186450000-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(2)\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2+\frac{1}{\phi}=$$

$$\frac{1}{\phi}+2\left(4.89725807896988186450000-\log(2)\log(21621600)-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\frac{\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k\left(-\frac{1}{2}\right)_k}{k!}}{\log^3(\log(21621600))}\right)^2$$

for $(x\in\mathbb{R}$ and $x<0)$

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + \frac{1}{\phi} =$$

$$\frac{1}{\phi} + 2\left(4.8972580789698818645000 - \log(2)\log(21621600) - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \left(\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\log(21621600)-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(\log(21621600)-z_0)/(2\pi)\rfloor)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\log(21621600)-z_0)^k z_0^{-k}}{k!}\right) \Big/ \log^3(\log(21621600))\right)^2$$

2*(((((4.8972580789698818645 – ln(2)*(((ln(21621600)^((ln(1.5)/(ln(2)))))))/((ln(ln(21621600))))- ln(2)*(ln(21621600))+(((((sqrt(ln(21621600))))/(((ln(ln(21621600))^3))))))))))^2+11 +Pi+1/golden ratio

Input interpretation:

$$2\left(4.8972580789698818645 - \log(2)\times\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + 11 + \pi + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Result:

139.858…

139.858… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + 11 + \pi + \frac{1}{\phi} =$$

$$11 + \pi + \frac{1}{\phi} + 2\left(4.8972580789698818645000 - \log_e(2)\log_e(21621600) - \frac{\log_e(2)\log_e^{\log_e(1.5)/\log_e(2)}(21621600)}{\log_e(\log(21621600))} + \frac{\sqrt{\log_e(21621600)}}{\log_e^3(\log(21621600))}\right)^2$$

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + 11 + \pi + \frac{1}{\phi} =$$

$$11 + \pi + \frac{1}{\phi} + 2\left(4.8972580789698818645000 - \log^2(a)\log_a(2)\log_a(21621600) - \frac{\log(a)\log_a(2)\left(\log(a)\log_a(21621600)\right)^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a)\log_a(\log(21621600))} + \frac{\sqrt{\log(a)\log_a(21621600)}}{\left(\log(a)\log_a(\log(21621600))\right)^3}\right)^2$$

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(2)\log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2 + 11 + \pi + \frac{1}{\phi} =$$

$$11 + \pi + \frac{1}{\phi} + 2\left(4.8972580789698818645000 - \text{Li}_1(-21621599)\,\text{Li}_1(-1) + -\frac{\text{Li}_1(-1)\left(-\text{Li}_1(-21621599)\right)^{(-\text{Li}_1(-0.5))/(-\text{Li}_1(-1))}}{\text{Li}_1(1-\log(21621600))} + \frac{\sqrt{-\text{Li}_1(-21621599)}}{\left(-\text{Li}_1(1-\log(21621600))\right)^3}\right)^2$$

Series representations:

$$2\left(4.89725807896988186450000-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(2)\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2+11+\pi+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\pi+2\left(4.89725807896988186450000-\log(2)\log(21621600)-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\frac{\sqrt{-1+\log(21621600)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}(-1+\log(21621600))^{-k}}{\log^3(\log(21621600))}\right)^2$$

$$2\left(4.89725807896988186450000-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(2)\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)^2+11+\pi+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\pi+2\left(4.89725807896988186450000-\log(2)\log(21621600)-\frac{\log(2)\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\frac{\exp\left(i\pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k\left(-\frac{1}{2}\right)_k}{k!}}{\log^3(\log(21621600))}\right)^2$$

for $(x \in \mathbb{R}$ and $x < 0)$

$$2\left(4.8972580789698818645000 - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(2)\log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}\right)^2 + 11 + \pi + \frac{1}{\phi} =$$

$$11 + \frac{1}{\phi} + \pi + 2\left(4.8972580789698818645000 - \log(2)\log(21\,621\,600) - \frac{\log(2)\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \left(\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\log(21\,621\,600)-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(\log(21\,621\,600)-z_0)/(2\pi)\rfloor)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\log(21\,621\,600)-z_0)^k z_0^{-k}}{k!}\right)\Big/ \log^3(\log(21\,621\,600))\right)^2$$

Now, we have that:

$$\phi(N) - \frac{\log(\frac{9}{8})}{\log 2}\frac{\sqrt{(\log N)}}{\log\log N} + \frac{4\log(\frac{3}{2})}{(\log\log N)^2} - R(\log N) + O\left\{\frac{\sqrt{(\log N)}}{(\log\log N)^3}\right\}$$

For R = 1, *O* = 1 and N = 21621600, we obtain:

ln(9/8) / ln(2) * (((sqrt(ln(21621600))/(((ln(ln(21621600)))))))) + ((4ln(3/2))) / (ln(ln(21621600)))^2 –
(ln(21621600))+((((sqrt(ln(21621600)))))/((ln(ln(21621600))^3))))

Input:

$$\frac{\log\left(\frac{9}{8}\right)}{\log(2)} \times \frac{\sqrt{\log(21\,621\,600)}}{\log(\log(21\,621\,600))} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))} - \log(21621600) + \frac{\log\left(\frac{9}{8}\right)\sqrt{\log(21621600)}}{\log(2)\log(\log(21621600))}$$

Decimal approximation:

-16.25720815728533436026901001509000360396456253390463711 17...

-16.2572081572….

Alternate forms:

$$-\left(\left(\log(2)\log(21621600)\log^3(\log(21621600)) - \log\left(\frac{9}{8}\right)\sqrt{\log(21621600)}\log^2(\log(21621600)) - \log(2)\sqrt{\log(21621600)} - 4\log\left(\frac{3}{2}\right)\log(2)\log(\log(21621600))\right)\Big/\left(\log(2)\log^3(\log(21621600))\right)\right)$$

$$\frac{\sqrt{5\log(2)+3\log(3)+2\log(5)+\log(1001)}}{\log^3(5\log(2)+3\log(3)+2\log(5)+\log(1001))} + \frac{4\log(3)-4\log(2)}{\log^2(5\log(2)+3\log(3)+2\log(5)+\log(1001))} - 5\log(2) - 3\log(3) - 2\log(5) - \log(1001) + \frac{(2\log(3)-3\log(2))\sqrt{5\log(2)+3\log(3)+2\log(5)+\log(1001)}}{\log(2)\log(5\log(2)+3\log(3)+2\log(5)+\log(1001))}$$

$$\left(-\log(2)(5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13))\log^3(5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13)) + (2\log(3)-3\log(2))\sqrt{5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13)}\log^2(5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13)) + \log(2)\sqrt{5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13)} - 4\log(2)(\log(2)-\log(3))\log(5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13))\right)\Big/\left(\log(2)\log^3(5\log(2)+3\log(3)+2\log(5)+\log(7)+\log(11)+\log(13))\right)$$

Alternative representations:

$$\frac{\sqrt{\log(21621600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}=-\log(a)\log_a(21621600)+\frac{4\log(a)\log_a\left(\frac{3}{2}\right)}{(\log(a)\log_a(\log(21621600)))^2}+\frac{\log(a)\log_a\left(\frac{9}{8}\right)\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(2))(\log(a)\log_a(\log(21621600)))}+\frac{\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(\log(21621600)))^3}$$

$$\frac{\sqrt{\log(21621600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}=-\log_e(21621600)+\frac{4\log_e\left(\frac{3}{2}\right)}{\log_e^2(\log(21621600))}+\frac{\log_e\left(\frac{9}{8}\right)\sqrt{\log_e(21621600)}}{\log_e(2)\log_e(\log(21621600))}+\frac{\sqrt{\log_e(21621600)}}{\log_e^3(\log(21621600))}$$

$$\frac{\sqrt{\log(21621600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}=\text{Li}_1(-21621599)-\frac{4\,\text{Li}_1\left(-\frac{1}{2}\right)}{(-\text{Li}_1(1-\log(21621600)))^2}-\frac{\text{Li}_1\left(1-\frac{9}{8}\right)\sqrt{-\text{Li}_1(-21621599)}}{\text{Li}_1(-1)(-\text{Li}_1(1-\log(21621600)))}+\frac{\sqrt{-\text{Li}_1(-21621599)}}{(-\text{Li}_1(1-\log(21621600)))^3}$$

Series representations:

$$\frac{\sqrt{\log(21621600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}=$$

$$-2 i \pi \left\lfloor \frac{\arg(21621600-x)}{2\pi} \right\rfloor - \log(x) + \sum_{k=1}^{\infty} \frac{(-1)^k (21621600-x)^k x^{-k}}{k} +$$

$$\frac{\sqrt{2 i \pi \left\lfloor \frac{\arg(21621600-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (21621600-x)^k x^{-k}}{k}}}{\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)^3} +$$

$$\frac{8 i \pi \left\lfloor \frac{\arg\left(\frac{3}{2}-x\right)}{2\pi} \right\rfloor}{\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)^2} +$$

$$\frac{4\log(x)}{\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)^2} -$$

$$\frac{4 \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{3}{2}-x\right)^k x^{-k}}{k}}{\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)^2} +$$

$$\left(2 i \pi \left\lfloor \frac{\arg\left(\frac{9}{8}-x\right)}{2\pi} \right\rfloor \sqrt{2 i \pi \left\lfloor \frac{\arg(21621600-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (21621600-x)^k x^{-k}}{k}}\right) \Big/$$

$$\left(\left(2 i \pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (2-x)^k x^{-k}}{k}\right)\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)\right) +$$

$$\left(\log(x) \sqrt{2 i \pi \left\lfloor \frac{\arg(21621600-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (21621600-x)^k x^{-k}}{k}}\right) \Big/$$

$$\left(\left(2 i \pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (2-x)^k x^{-k}}{k}\right)\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)\right) -$$

$$\left(\left(\sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{9}{8}-x\right)^k x^{-k}}{k}\right) \sqrt{2 i \pi \left\lfloor \frac{\arg(21621600-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (21621600-x)^k x^{-k}}{k}}\right) \Big/$$

$$\left(\left(2 i \pi \left\lfloor \frac{\arg(2-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (2-x)^k x^{-k}}{k}\right)\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(21621600))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(21621600))^k}{k}\right)\right) \quad \text{for } x<0$$

$$\frac{\sqrt{\log(21\,621\,600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21\,621\,600))\log(2)}+$$

$$\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))}-\log(21\,621\,600)+\frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}=$$

$$-2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}+$$

$$\frac{\sqrt{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}}}{\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)^3}+$$

$$\frac{8\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor}{\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)^2}+$$

$$\frac{4\log(z_0)}{\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)^2}-$$

$$\frac{4\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{3}{2}-z_0\right)^k\,z_0^{-k}}{k}}{\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)^2}+$$

$$\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sqrt{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}}\right)\Bigg/$$

$$\left(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\right)\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)\right)+$$

$$\left(\log(z_0)\sqrt{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}}\right)\Bigg/$$

$$\left(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\right)\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)\right)-$$

$$\left(\left(\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{9}{8}-z_0\right)^k\,z_0^{-k}}{k}\right)\sqrt{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}}\right)\Bigg/$$

$$\left(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\right)\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\right)\right)$$

$$\frac{\sqrt{\log(21\,621\,600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21\,621\,600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))}-\log(21\,621\,600)+$$

$$\frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}=-\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-\log(z_0)-$$

$$\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}+$$

$$\Bigg(\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)^3+\left(4\left\lfloor\frac{\arg\left(\frac{3}{2}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)\right)\Bigg/$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)^2+$$

$$(4\log(z_0))\Bigg/\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)^2+\left(4\left\lfloor\frac{\arg\left(\frac{3}{2}-z_0\right)}{2\pi}\right\rfloor\log(z_0)\right)\Bigg/$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)^2-$$

$$\left(4\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{3}{2}-z_0\right)^k z_0^{-k}}{k}\right)\Bigg/\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor$$

$$\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)^2+$$

$$\Bigg(\left\lfloor\frac{\arg\left(\frac{9}{8}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)+$$

$$\Bigg(\log(z_0)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)+$$

$$\Bigg(\left\lfloor\frac{\arg\left(\frac{9}{8}-z_0\right)}{2\pi}\right\rfloor\log(z_0)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)-$$

$$\Bigg(\left(\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{9}{8}-z_0\right)^k z_0^{-k}}{k}\right)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21\,621\,600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(21\,621\,600-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(2-z_0)^k\,z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21\,621\,600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(21\,621\,600)-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)$$

-(((ln(9/8) / ln(2) * (((sqrt(ln(21621600))/(((ln(ln(21621600))))))) + ((4ln(3/2))) / (ln(ln(21621600)))^2 – (ln(21621600))+((((sqrt(ln(21621600)))))/((ln(ln(21621600))^3)))-1/golden ratio)))

Input:

$$-\left(\frac{\log\left(\frac{9}{8}\right)}{\log(2)} \times \frac{\sqrt{\log(21\,621\,600)}}{\log(\log(21\,621\,600))} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} - \frac{1}{\phi}\right)$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi} - \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} - \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} + \log(21\,621\,600) - \frac{\log\left(\frac{9}{8}\right)\sqrt{\log(21\,621\,600)}}{\log(2)\log(\log(21\,621\,600))}$$

Decimal approximation:

16.87524214603522920847359684945564172168487171371039997386...

16.875242146…. result practically equal to the black hole entropy 16.8741 and to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Alternate forms:

$$\frac{1}{2}\left(-1+\sqrt{5} - \frac{8\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))}\right) - \frac{\sqrt{\log(21\,621\,600)}\left(\log\left(\frac{9}{8}\right)\log^2(\log(21\,621\,600)) + \log(2)\right)}{\log(2)\log^3(\log(21\,621\,600))} + \log(21\,621\,600)$$

$$-\frac{2\left(-\log^2(\log(21\,621\,600)) + 2\log\left(\frac{3}{2}\right) + 2\sqrt{5}\log\left(\frac{3}{2}\right)\right)}{\left(1+\sqrt{5}\right)\log^2(\log(21\,621\,600))} - \frac{\sqrt{\log(21\,621\,600)}\left(\log\left(\frac{9}{8}\right)\log^2(\log(21\,621\,600)) + \log(2)\right)}{\log(2)\log^3(\log(21\,621\,600))} + \log(21\,621\,600)$$

$$\Big(2\log(2)\log^3(\log(21\,621\,600)) + \log(2)\log(21\,621\,600)\log^3(\log(21\,621\,600)) + \sqrt{5}\,\log(2)\log(21\,621\,600)\log^3(\log(21\,621\,600)) - \log\left(\frac{9}{8}\right)\sqrt{\log(21\,621\,600)}\,\log^2(\log(21\,621\,600)) - \log\left(\frac{9}{8}\right)\sqrt{5\log(21\,621\,600)}\,\log^2(\log(21\,621\,600)) - \log(2)\sqrt{\log(21\,621\,600)} - \log(2)\sqrt{5\log(21\,621\,600)} - 4\log\left(\frac{3}{2}\right)\log(2)\log(\log(21\,621\,600)) - 4\sqrt{5}\,\log\left(\frac{3}{2}\right)\log(2)\log(\log(21\,621\,600))\Big) \Big/ \Big(\left(1+\sqrt{5}\right)\log(2)\log^3(\log(21\,621\,600))\Big)$$

Alternative representations:

$$-\left(\frac{\sqrt{\log(21\,621\,600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21\,621\,600))\log(2)} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} - \frac{1}{\phi}\right) = \log(a)\log_a(21\,621\,600) + \frac{1}{\phi} - \frac{4\log(a)\log_a\left(\frac{3}{2}\right)}{(\log(a)\log_a(\log(21\,621\,600)))^2} - \frac{\log(a)\log_a\left(\frac{9}{8}\right)\sqrt{\log(a)\log_a(21\,621\,600)}}{(\log(a)\log_a(2))(\log(a)\log_a(\log(21\,621\,600)))} - \frac{\sqrt{\log(a)\log_a(21\,621\,600)}}{(\log(a)\log_a(\log(21\,621\,600)))^3}$$

$$-\left(\frac{\sqrt{\log(21\,621\,600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21\,621\,600))\log(2)} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} - \frac{1}{\phi}\right) = \log_e(21\,621\,600) + \frac{1}{\phi} - \frac{4\log_e\left(\frac{3}{2}\right)}{\log_e^2(\log(21\,621\,600))} - \frac{\log_e\left(\frac{9}{8}\right)\sqrt{\log_e(21\,621\,600)}}{\log_e(2)\log_e(\log(21\,621\,600))} - \frac{\sqrt{\log_e(21\,621\,600)}}{\log_e^3(\log(21\,621\,600))}$$

$$-\left(\frac{\sqrt{\log(21\,621\,600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21\,621\,600))\log(2)} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} - \frac{1}{\phi}\right) =$$

$$-\text{Li}_1(-21\,621\,599) + \frac{1}{\phi} + \frac{4\,\text{Li}_1\left(-\frac{1}{2}\right)}{(-\text{Li}_1(1-\log(21\,621\,600)))^2} + -\frac{\text{Li}_1\left(1-\frac{9}{8}\right)\sqrt{-\text{Li}_1(-21\,621\,599)}}{\text{Li}_1(-1)\,(-\text{Li}_1(1-\log(21\,621\,600)))} - \frac{\sqrt{-\text{Li}_1(-21\,621\,599)}}{(-\text{Li}_1(1-\log(21\,621\,600)))^3}$$

Series representations:

$$-\left(\frac{\sqrt{\log(21621600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\right.$$

$$\left.\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)=$$

$$\frac{2}{1+\sqrt{5}}+2 i \pi\left\lfloor\frac{\arg(21621600-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-x)^k x^{-k}}{k}-$$

$$\frac{\sqrt{2 i \pi\left\lfloor\frac{\arg(21621600-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-x)^k x^{-k}}{k}}}{\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)^3}-$$

$$\frac{8 i \pi\left\lfloor\frac{\arg\left(\frac{3}{2}-x\right)}{2\pi}\right\rfloor}{\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)^2}-$$

$$\frac{4\log(x)}{\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)^2}+$$

$$\frac{4\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{3}{2}-x\right)^k x^{-k}}{k}}{\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)^2}-$$

$$\left(2 i \pi\left\lfloor\frac{\arg\left(\frac{9}{8}-x\right)}{2\pi}\right\rfloor\right.$$

$$\left.\sqrt{2 i \pi\left\lfloor\frac{\arg(21621600-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-x)^k x^{-k}}{k}}\right)\Big/$$

$$\left(\left(2 i \pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k}\right)\right.$$

$$\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\right.$$

$$\left.\left.\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)\right)-$$

$$\left(\log(x)\sqrt{2 i \pi\left\lfloor\frac{\arg(21621600-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-x)^k x^{-k}}{k}}\right)\Big/$$

$$\left(\left(2 i \pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k}\right)\right.$$

$$\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\right.$$

$$\left.\left.\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)\right)+\left(\left(\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{9}{8}-x\right)^k x^{-k}}{k}\right)\right.$$

$$\left.\sqrt{2 i \pi\left\lfloor\frac{\arg(21621600-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-x)^k x^{-k}}{k}}\right)\Big/$$

$$\left(\left(2 i \pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k}\right)\right.$$

$$\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(21621600))}{2\pi}\right\rfloor+\log(x)-\right.$$

$$\left.\left.\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(21621600))^k}{k}\right)\right)\quad\text{for } x<0$$

$$
-\left(\frac{\sqrt{\log(21\,621\,600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21\,621\,600))\log(2)} + \frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} - \frac{1}{\phi}\right) =
$$

$$
\frac{2}{1+\sqrt{5}} + 2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (21\,621\,600 - z_0)^k z_0^{-k}}{k} -
$$

$$
\frac{\sqrt{2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (21\,621\,600 - z_0)^k z_0^{-k}}{k}}}{\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)^3} -
$$

$$
\frac{8 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor}{\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)^2} -
$$

$$
\frac{4\log(z_0)}{\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)^2} +
$$

$$
\frac{4\sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{3}{2} - z_0\right)^k z_0^{-k}}{k}}{\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)^2} -
$$

$$
\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor \sqrt{2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (21\,621\,600 - z_0)^k z_0^{-k}}{k}}\right) \Big/
$$

$$
\left(\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (2 - z_0)^k z_0^{-k}}{k}\right) \left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)\right) -
$$

$$
\left(\log(z_0) \sqrt{2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (21\,621\,600 - z_0)^k z_0^{-k}}{k}}\right) \Big/
$$

$$
\left(\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (2 - z_0)^k z_0^{-k}}{k}\right) \left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)\right) + \left(\left(\sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{9}{8} - z_0\right)^k z_0^{-k}}{k}\right)\right.
$$

$$
\left.\sqrt{2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (21\,621\,600 - z_0)^k z_0^{-k}}{k}}\right) \Big/
$$

$$
\left(\left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (2 - z_0)^k z_0^{-k}}{k}\right) \left(2 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor + \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(21\,621\,600) - z_0)^k z_0^{-k}}{k}\right)\right)
$$

$$-\Bigg(\frac{\sqrt{\log(21621600)}\,\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-$$

$$\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\Bigg)=$$

$$\frac{2}{1+\sqrt{5}}+\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+$$

$$\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-z_0)^k z_0^{-k}}{k}-$$

$$\Bigg(\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)\Big/$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)^3-\Bigg(4\left\lfloor\frac{\arg\left(\frac{3}{2}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)\Bigg)\Big/$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)^2-$$

$$(4\log(z_0))\Big/\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)^2-\Bigg(4\left\lfloor\frac{\arg\left(\frac{3}{2}-z_0\right)}{2\pi}\right\rfloor\log(z_0)\Bigg)\Big/$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)^2+$$

$$\Bigg(4\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{3}{2}-z_0\right)^k z_0^{-k}}{k}\Bigg)\Big/\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor$$

$$\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)^2-$$

$$\Bigg(\left\lfloor\frac{\arg\left(\frac{9}{8}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)\Big/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)-$$

$$\Bigg(\log(z_0)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)\Big/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)-$$

$$\Bigg(\left\lfloor\frac{\arg\left(\frac{9}{8}-z_0\right)}{2\pi}\right\rfloor\log(z_0)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)\Big/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)+$$

$$\Bigg(\Bigg(\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{9}{8}-z_0\right)^k z_0^{-k}}{k}\Bigg)\sqrt{\Bigg(\log(z_0)+\left\lfloor\frac{\arg(21621600-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-}$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(21621600-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)\Big/$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}\Bigg)$$

$$\Bigg(\log(z_0)+\left\lfloor\frac{\arg(\log(21621600)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(21621600)-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)$$

7*-(((ln(9/8) / ln(2) * (((sqrt(ln(21621600))/(((ln(ln(21621600)))))))) + ((4ln(3/2))) / (ln(ln(21621600)))^2 – (ln(21621600))+((((sqrt(ln(21621600)))))/((ln(ln(21621600))^3)))-1/golden ratio)))+7

Input:

$$7\times(-1)\left(\frac{\log\left(\frac{9}{8}\right)}{\log(2)}\times\frac{\sqrt{\log(21\,621\,600)}}{\log(\log(21\,621\,600))}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))}-\log(21\,621\,600)+\frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}-\frac{1}{\phi}\right)+7$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$7-7\left(-\frac{1}{\phi}+\frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))}-\log(21\,621\,600)+\frac{\log\left(\frac{9}{8}\right)\sqrt{\log(21\,621\,600)}}{\log(2)\log(\log(21\,621\,600))}\right)$$

Decimal approximation:

125.12669502224660445931517794618949205179410199597279981 70...

125.1266950222466…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$7\left(1+\frac{2}{1+\sqrt{5}}-\sqrt{\log(21\,621\,600)}\left(\frac{1}{\log^3(\log(21\,621\,600))}+\frac{\log\left(\frac{9}{8}\right)}{\log(2)\log(\log(21\,621\,600))}\right)-\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21\,621\,600))}+\log(21\,621\,600)\right)$$

$$7+\frac{14}{1+\sqrt{5}}-\frac{7\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{28\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}+7\log(21621600)-\frac{7\log\left(\frac{9}{8}\right)\sqrt{\log(21621600)}}{\log(2)\log(\log(21621600))}$$

$$\frac{7\left(3\log^2(\log(21621600))+\sqrt{5}\log^2(\log(21621600))-4\log\left(\frac{3}{2}\right)-4\sqrt{5}\log\left(\frac{3}{2}\right)\right)}{\left(1+\sqrt{5}\right)\log^2(\log(21621600))}-\frac{7\sqrt{\log(21621600)}\left(\log\left(\frac{9}{8}\right)\log^2(\log(21621600))+\log(2)\right)}{\log(2)\log^3(\log(21621600))}+7\log(21621600)$$

Alternative representations:

$$7(-1)\left(\frac{\sqrt{\log(21621600)}\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+7=$$
$$7-7\left(-\log(a)\log_a(21621600)-\frac{1}{\phi}+\frac{4\log(a)\log_a\left(\frac{3}{2}\right)}{(\log(a)\log_a(\log(21621600)))^2}+\frac{\log(a)\log_a\left(\frac{9}{8}\right)\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(2))(\log(a)\log_a(\log(21621600)))}+\frac{\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(\log(21621600)))^3}\right)$$

$$7(-1)\left(\frac{\sqrt{\log(21621600)}\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+7=$$
$$7-7\left(-\log_e(21621600)-\frac{1}{\phi}+\frac{4\log_e\left(\frac{3}{2}\right)}{\log_e^2(\log(21621600))}+\frac{\log_e\left(\frac{9}{8}\right)\sqrt{\log_e(21621600)}}{\log_e(2)\log_e(\log(21621600))}+\frac{\sqrt{\log_e(21621600)}}{\log_e^3(\log(21621600))}\right)$$

$$7(-1)\left(\frac{\sqrt{\log(21621600)}\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+7=$$

$$7-7\left(\mathrm{Li}_1(-21621599)-\frac{1}{\phi}-\frac{4\,\mathrm{Li}_1\left(-\frac{1}{2}\right)}{(-\mathrm{Li}_1(1-\log(21621600)))^2}-\frac{\mathrm{Li}_1\left(1-\frac{9}{8}\right)\sqrt{-\mathrm{Li}_1(-21621599)}}{\mathrm{Li}_1(-1)(-\mathrm{Li}_1(1-\log(21621600)))}+\frac{\sqrt{-\mathrm{Li}_1(-21621599)}}{(-\mathrm{Li}_1(1-\log(21621600)))^3}\right)$$

7*-(((ln(9/8) / ln(2) * (((sqrt(ln(21621600))/(((ln(ln(21621600)))))))) + ((4ln(3/2))) / (ln(ln(21621600)))^2 – (ln(21621600))+((((sqrt(ln(21621600)))))/((ln(ln(21621600))^3)))-1/golden ratio)))+18+3

Input:

$$7\times(-1)\left(\frac{\log\left(\frac{9}{8}\right)}{\log(2)}\times\frac{\sqrt{\log(21621600)}}{\log(\log(21621600))}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+18+3$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$21-7\left(-\frac{1}{\phi}+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\log\left(\frac{9}{8}\right)\sqrt{\log(21621600)}}{\log(2)\log(\log(21621600))}\right)$$

Decimal approximation:

139.1266950222466044593151779461894920517941019959727998170...

139.1266950222466…. result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$7\left(3+\frac{2}{1+\sqrt{5}}-\sqrt{\log(21621600)}\left(\frac{1}{\log^3(\log(21621600))}+\frac{\log\left(\frac{9}{8}\right)}{\log(2)\log(\log(21621600))}\right)-\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}+\log(21621600)\right)$$

$$21+\frac{14}{1+\sqrt{5}}-\frac{7\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{28\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}+7\log(21621600)-\frac{7\log\left(\frac{9}{8}\right)\sqrt{\log(21621600)}}{\log(2)\log(\log(21621600))}$$

$$\frac{7\left(5\log^2(\log(21621600))+3\sqrt{5}\log^2(\log(21621600))-4\log\left(\frac{3}{2}\right)-4\sqrt{5}\log\left(\frac{3}{2}\right)\right)}{\left(1+\sqrt{5}\right)\log^2(\log(21621600))}-\frac{7\sqrt{\log(21621600)}\left(\log\left(\frac{9}{8}\right)\log^2(\log(21621600))+\log(2)\right)}{\log(2)\log^3(\log(21621600))}+7\log(21621600)$$

Alternative representations:

$$7(-1)\left(\frac{\sqrt{\log(21621600)}\log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+18+3=$$

$$21-7\left(-\log(a)\log_a(21621600)-\frac{1}{\phi}+\frac{4\log(a)\log_a\left(\frac{3}{2}\right)}{(\log(a)\log_a(\log(21621600)))^2}+\frac{\log(a)\log_a\left(\frac{9}{8}\right)\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(2))(\log(a)\log_a(\log(21621600)))}+\frac{\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(\log(21621600)))^3}\right)$$

$$7(-1)\left(\frac{\sqrt{\log(21621600)}\ \log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+18+3=$$

$$21-7\left(-\log_e(21621600)-\frac{1}{\phi}+\frac{4\log_e\left(\frac{3}{2}\right)}{\log_e^2(\log(21621600))}+\frac{\log_e\left(\frac{9}{8}\right)\sqrt{\log_e(21621600)}}{\log_e(2)\log_e(\log(21621600))}+\frac{\sqrt{\log_e(21621600)}}{\log_e^3(\log(21621600))}\right)$$

$$7(-1)\left(\frac{\sqrt{\log(21621600)}\ \log\left(\frac{9}{8}\right)}{\log(\log(21621600))\log(2)}+\frac{4\log\left(\frac{3}{2}\right)}{\log^2(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}-\frac{1}{\phi}\right)+18+3=$$

$$21-7\left(\mathrm{Li}_1(-21621599)-\frac{1}{\phi}-\frac{4\,\mathrm{Li}_1\left(-\frac{1}{2}\right)}{(-\mathrm{Li}_1(1-\log(21621600)))^2}-\frac{\mathrm{Li}_1\left(1-\frac{9}{8}\right)\sqrt{-\mathrm{Li}_1(-21621599)}}{\mathrm{Li}_1(-1)(-\mathrm{Li}_1(1-\log(21621600)))}+\frac{\sqrt{-\mathrm{Li}_1(-21621599)}}{(-\mathrm{Li}_1(1-\log(21621600)))^3}\right)$$

Now, we have that:

$$\phi(N)=\frac{\log(\frac{3}{2})}{\log 2}Li\{(\log N)^{\log(\frac{3}{2})/\log 2}\}-\frac{(\log N)^{\log(\frac{3}{2})/\log 2}}{\log\log N}-R(\log N)+O\left\{\frac{\sqrt{(\log N)}}{(\log\log N)^3}\right\}.$$

ln(3/2) / ln(2) Li(ln(21621600))^(ln(1.5)/ln(2)))-((ln(21621600))^(ln(1.5)/ln(2)))/((ln(ln(21621600))))-(ln(21621600))+((((sqrt(ln(21621600))))))/((((ln(ln(21621600))))))^3

Input:

$$\frac{\log\left(\frac{3}{2}\right)}{\log(2)} \operatorname{li}(\log(21\,621\,600))^{\log(1.5)/\log(2)} - \left(\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}\right)$$

$\log(x)$ is the natural logarithm

$\operatorname{li}(x)$ is the logarithmic integral

Result:

-16.4632...

-16.4632…. result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV with minus sign

Alternative representations:

$$\frac{\operatorname{li}(\log(21\,621\,600))^{\log(1.5)/\log(2)} \log\left(\frac{3}{2}\right)}{\log(2)} - \left(\frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}\right) = -\log(21\,621\,600) + \frac{\log\left(\frac{3}{2}\right) \operatorname{Ei}(\log(\log(21\,621\,600)))^{\log(1.5)/\log(2)}}{\log(2)} - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))}$$

$$\frac{\operatorname{li}(\log(21\,621\,600))^{\log(1.5)/\log(2)} \log\left(\frac{3}{2}\right)}{\log(2)} - \frac{\log^{\log(1.5)/\log(2)}(21\,621\,600)}{\log(\log(21\,621\,600))} - \log(21\,621\,600) + \frac{\sqrt{\log(21\,621\,600)}}{\log^3(\log(21\,621\,600))} = -\log(a)\log_a(21\,621\,600) + \frac{\log(a)\log_a\left(\frac{3}{2}\right) \operatorname{li}(\log(a)\log_a(21\,621\,600))^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a)\log_a(2)} - \frac{(\log(a)\log_a(21\,621\,600))^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a)\log_a(\log(21\,621\,600))} + \frac{\sqrt{\log(a)\log_a(21\,621\,600)}}{(\log(a)\log_a(\log(21\,621\,600)))^3}$$

$$\frac{\operatorname{li}(\log(21621600))^{\log(1.5)/\log(2)} \log\left(\frac{3}{2}\right)}{\log(2)} - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))} = -\log(21621600) - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} + \frac{1}{\log(2)} \log\left(\frac{3}{2}\right)\left(-\Gamma(0, -\log(\log(21621600))) - \log(-\log(\log(21621600))) + \frac{1}{2}\left(\log(\log(\log(21621600))) - \log\left(\frac{1}{\log(\log(21621600))}\right)\right)\right)^{\log(1.5)/\log(2)} + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}$$

-8*(((ln(3/2) / ln(2) Li(ln(21621600))^(ln(1.5)/ln(2)))-((ln(21621600))^(ln(1.5)/ln(2)))/((ln(ln(21621600))))-(ln(21621600))+((((sqrt(ln(21621600))))))/((((ln(ln(21621600))))))^3))+8

Input:

$$-8\left(\frac{\log\left(\frac{3}{2}\right)}{\log(2)} \operatorname{li}(\log(21621600))^{\log(1.5)/\log(2)} - \frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))} - \log(21621600) + \frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right) + 8$$

$\log(x)$ is the natural logarithm

$\operatorname{li}(x)$ is the logarithmic integral

Result:

139.705...

139.705… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$-8\left(\frac{\text{li}(\log(21621600))^{\log(1.5)/\log(2)}\log\left(\frac{3}{2}\right)}{\log(2)}-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)+8=8-8\left(-\log(21621600)+\frac{\log\left(\frac{3}{2}\right)\text{Ei}(\log(\log(21621600)))^{\log(1.5)/\log(2)}}{\log(2)}-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)$$

$$-8\left(\frac{\text{li}(\log(21621600))^{\log(1.5)/\log(2)}\log\left(\frac{3}{2}\right)}{\log(2)}-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)+8=8-8\left(-\log(a)\log_a(21621600)+\frac{\log(a)\log_a\left(\frac{3}{2}\right)\text{li}(\log(a)\log_a(21621600))^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a)\log_a(2)}-\frac{(\log(a)\log_a(21621600))^{(\log(a)\log_a(1.5))/(\log(a)\log_a(2))}}{\log(a)\log_a(\log(21621600))}+\frac{\sqrt{\log(a)\log_a(21621600)}}{(\log(a)\log_a(\log(21621600)))^3}\right)$$

$$-8\left(\frac{\text{li}(\log(21621600))^{\log(1.5)/\log(2)}\log\left(\frac{3}{2}\right)}{\log(2)}-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}-\log(21621600)+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)+8=$$

$$8-8\left(-\log(21621600)-\frac{\log^{\log(1.5)/\log(2)}(21621600)}{\log(\log(21621600))}+\frac{1}{\log(2)}\log\left(\frac{3}{2}\right)\left(-\Gamma(0,-\log(\log(21621600)))-\log(-\log(\log(21621600)))+\frac{1}{2}\left(\log(\log(\log(21621600)))-\log\left(\frac{1}{\log(\log(21621600))}\right)\right)\right)^{\log(1.5)/\log(2)}+\frac{\sqrt{\log(21621600)}}{\log^3(\log(21621600))}\right)$$

From:

https://blog.wolfram.com/2013/05/01/after-100-years-ramanujan-gap-filled/

$S\left(e^{-\frac{\pi}{\sqrt{5}}}\right)$	$\sqrt[5]{\sqrt{1+\frac{(\sqrt{5}-1)^{10}}{1024}}-\frac{1}{32}(\sqrt{5}-1)^5}$	Ramanujan
$S\left(e^{-\frac{\pi}{\sqrt{15}}}\right)$	$\frac{\sqrt[5]{-3+5\sqrt{5}+\sqrt{30(5-\sqrt{5})}}}{2^{2/5}}$	Ramanathan
$S\left(e^{-\sqrt{\frac{3}{5}}\pi}\right)$	$\frac{\sqrt[5]{-3-5\sqrt{5}+\sqrt{30(5+\sqrt{5})}}}{2^{2/5}}$	Ramanathan
$S(e^{-\pi/5})$	$\frac{\sqrt[5]{9-\sqrt{5}+3\sqrt{2(5-\sqrt{5})}}}{\sqrt[5]{2}}$	Ramanathan
$S\left(e^{-\frac{\pi}{\sqrt{35}}}\right)$	$\sqrt[5]{-7+5\sqrt{5}+\sqrt{35(5-2\sqrt{5})}}$	Ramanujan
$S\left(e^{-\sqrt{\frac{7}{5}}\pi}\right)$	$\sqrt[5]{-7-5\sqrt{5}+\sqrt{35(5+2\sqrt{5})}}$	Ramanujan
$S\left(e^{-\frac{\pi}{3\sqrt{5}}}\right)$	$(568-325\sqrt{3}-260\sqrt{5}+150\sqrt{15}+2\sqrt{(5(65750-37960\sqrt{3}-29393\sqrt{5}+16970\sqrt{15}))})$^(1/5)	Marichev
$S\left(e^{-\frac{3\pi}{\sqrt{5}}}\right)$	$\sqrt[5]{\sqrt{a^2+1}-a}$ where $a=-568-325\sqrt{3}+260\sqrt{5}+150\sqrt{15}$	Berndt
$S\left(e^{-\frac{\pi}{\sqrt{55}}}\right)$	$\left(-\frac{81}{8}-\frac{45\sqrt{5}}{8}+\frac{25}{4}\sqrt{\frac{1}{2}(19+9\sqrt{5})}+\frac{3}{4}\sqrt{\left(5\left(225+103\sqrt{5}-5\sqrt{22(181+81\sqrt{5})}\right)\right)}\right)$^(1/5)	Marichev
$S\left(e^{-\sqrt{\frac{11}{5}}\pi}\right)$	$\sqrt[5]{\sqrt{a^2+1}-a}$ where $a=\frac{1}{8}\left(81+45\sqrt{5}+25\sqrt{38+18\sqrt{5}}\right)$	Berndt
$S\left(e^{-\sqrt{\frac{13}{5}}\pi}\right)$	$\sqrt[5]{\sqrt{a^2+1}-a}$ where $a=\frac{1}{2}\left(\left(\frac{\left(\sqrt{\sqrt{65}+7}-\sqrt{\sqrt{65}-1}\right)\sqrt{5}}{\left(\sqrt{\sqrt{65}+9}-\sqrt{\sqrt{65}+7}\right)2}\right)^3-11\right)$	Berndt
$S\left(e^{-\frac{\pi}{5\sqrt{3}}}\right)$	$\sqrt[5]{3+\sqrt{5}+\sqrt{15+6\sqrt{5}}}$	Marichev
$S\left(e^{-\frac{\sqrt{3}\pi}{5}}\right)$	$\sqrt[5]{3-\sqrt{5}+\sqrt{3(5-2\sqrt{5})}}$	Marichev

We have that:

((((((((1+((sqrt5-1)^10)/1024))^1/2 – 1/32(sqrt5-1)^5))))^1/5

Input:

$$\sqrt[5]{\sqrt{1+\frac{(\sqrt{5}-1)^{10}}{1024}}-\frac{1}{32}\left(\sqrt{5}-1\right)^5}$$

Decimal approximation:

0.982151564550401278618628523902506593809168530490215164666...

0.98215156455…. result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{\sqrt{5}}}}{\frac{\sqrt{5}}{1+\sqrt[5]{\sqrt{\varphi^5\sqrt[4]{5^3}}-1}}-\varphi+1}=1-\frac{e^{-\pi\sqrt{5}}}{1+\frac{e^{-2\pi\sqrt{5}}}{1+\frac{e^{-3\pi\sqrt{5}}}{1+\frac{e^{-4\pi\sqrt{5}}}{1+\dots}}}}\approx 0.9991104684$$

and to the dilaton value **0.989117352243 =** $\boldsymbol{\phi}$

Alternate forms:

$$\frac{1}{2}\sqrt[5]{\sqrt{10\left(25-11\sqrt{5}\right)}-5\sqrt{5}+11}\;2^{4/5}$$

$$\sqrt[5]{\frac{1}{2}\left(11-5\sqrt{5}+\sqrt{250-110\sqrt{5}}\right)}$$

$$\sqrt[5]{\frac{1}{2}\left(11-5\sqrt{5}+\sqrt{10\left(25-11\sqrt{5}\right)}\right)}$$

Minimal polynomial:

$$x^{20}-22x^{15}-6x^{10}+22x^5+1$$

Continued fraction:

$$\cfrac{1}{1+\cfrac{1}{55+\cfrac{1}{36+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{78+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{21+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

(((-7+5sqrt5+(35(5-2sqrt5))^1/2)))^1/5

Input:

$$\sqrt[5]{-7+5\sqrt{5}+\sqrt{35\left(5-2\sqrt{5}\right)}}$$

Decimal approximation:

1.533433933531672725045223292893931793005891204687420376743...

1.53343393353167…..

Alternate form:

$$\sqrt[5]{\sqrt{175-70\sqrt{5}}+5\sqrt{5}-7}$$

Minimal polynomial:

$$x^{20}+28x^{15}-306x^{10}-28x^{5}+1$$

Continued fraction:

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{43+\cfrac{1}{3+\cfrac{1}{5+\cfrac{1}{33+\cfrac{1}{1+\cfrac{1}{15+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

(((-7-5sqrt5+(35(5+2sqrt5))^1/2)))^1/5

Input:

$$\sqrt[5]{-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}$$

Decimal approximation:

0.48731297839151096836428789843891609242196016689765382 2602...

0.48731297839151…..

Alternate form:

$$\sqrt[5]{\sqrt{175+70\sqrt{5}}-5\sqrt{5}-7}$$

Minimal polynomial:

$x^{20}+28x^{15}-306x^{10}-28x^5+1$

Continued fraction:

$$\cfrac{1}{2+\cfrac{1}{19+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{13+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{14+\cfrac{1}{5+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

(((-81/8-(45sqrt5)/8+25/4(1/2(19+9sqrt5))^1/2+3/4((((5(225+103sqrt5-5sqrt(22(181+81sqrt5)))))^1/2)))))^(1/5)

Input:

$$\left(-\frac{81}{8}-\frac{1}{8}\left(45\sqrt{5}\right)+\frac{25}{4}\sqrt{\frac{1}{2}\left(19+9\sqrt{5}\right)}+\frac{3}{4}\sqrt{5\left(225+103\sqrt{5}-5\sqrt{22\left(181+81\sqrt{5}\right)}\right)}\right)\hat{}\,(1/5)$$

Result:

$$\left(-\frac{81}{8}-\frac{45\sqrt{5}}{8}+\frac{25}{4}\sqrt{\frac{1}{2}\left(19+9\sqrt{5}\right)}+\frac{3}{4}\sqrt{5\left(225+103\sqrt{5}-5\sqrt{22\left(181+81\sqrt{5}\right)}\right)}\right)\hat{}\,(1/5)$$

Decimal approximation:

1.584291893060286610795091161449694716780476770797317977602...

1.584291893060286……

Alternate forms:

$$\frac{1}{2}\left(25\sqrt{2\left(19+9\sqrt{5}\right)}-45\sqrt{5}+6\sqrt{5\left(-5\sqrt{22\left(181+81\sqrt{5}\right)}+103\sqrt{5}+225\right)}-81\right)\hat{}\,(1/5)\,2^{2/5}$$

$$\sqrt[5]{\text{root of } x^8+81x^7-1778x^6+19683x^5-107805x^4-19683x^3-1778x^2-81x+1 \text{ near } x=9.98104}$$

$$\frac{1}{2^{3/5}}\left(\left(-81-45\sqrt{5}+25\sqrt{2\left(19+9\sqrt{5}\right)}+6\sqrt{5\left(225+103\sqrt{5}-5\sqrt{22\left(181+81\sqrt{5}\right)}\right)}\right)\hat{}\,(1/5)\right)$$

Minimal polynomial:

$$x^{40}+81x^{35}-1778x^{30}+19683x^{25}-107805x^{20}-19683x^{15}-1778x^{10}-81x^5+1$$

Continued fraction:

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}}$$

(((568-325sqrt3-260sqrt5+150sqrt15+2*((5(65750-37960sqrt3-29393sqrt5+16970sqrt15)))^1/2)))^(1/5)

Input:

$$\left(568-325\sqrt{3}-260\sqrt{5}+150\sqrt{15}+2\sqrt{5\left(65750-37960\sqrt{3}-29393\sqrt{5}+16970\sqrt{15}\right)}\right)\hat{}\,(1/5)$$

Decimal approximation:

1.565829228024777664860933047736332426997348061928888469224...

1.5658292280247776….

Alternate forms:

$$\left(2\sqrt{328750-189800\sqrt{3}-146965\sqrt{5}+84850\sqrt{15}}-325\sqrt{3}-260\sqrt{5}+150\sqrt{15}+568\right)\hat{}\,(1/5)$$

$$\sqrt[5]{\text{root of } x^8-4544x^7-196028x^6+5407808x^5-29175930x^4-5407808x^3-196028x^2+4544x+1 \text{ near } x=9.41287}$$

Minimal polynomial:

$$x^{40}-4544x^{35}-196028x^{30}+5407808x^{25}-29175930x^{20}-5407808x^{15}-196028x^{10}+4544x^5+1$$

Continued fraction:

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

For a = -568-325sqrt3+260sqrt5+150sqrt15

((((sqrt(((-568-325sqrt3+260sqrt5+150sqrt15)^2+1))-(-568-325sqrt3+260sqrt5+150sqrt15)))))^1/5

Input:

$$\left(\sqrt{\left(-568-325\sqrt{3}+260\sqrt{5}+150\sqrt{15}\right)^2+1}-\left(-568-325\sqrt{3}+260\sqrt{5}+150\sqrt{15}\right)\right)\wedge(1/5)$$

Result:

$$\left(568+325\sqrt{3}-260\sqrt{5}-150\sqrt{15}+\sqrt{1+\left(-568-325\sqrt{3}+260\sqrt{5}+150\sqrt{15}\right)^2}\right)\wedge(1/5)$$

Decimal approximation:

0.436879941888840499316219672919154029445259002822252793774...

0.43687994188884049 93……

Alternate forms:

$$\left(\sqrt{1315000+759200\sqrt{3}-587860\sqrt{5}-339400\sqrt{15}}+325\sqrt{3}-260\sqrt{5}-150\sqrt{15}+568\right)\wedge(1/5)$$

$$\left(568+325\sqrt{3}-260\sqrt{5}-150\sqrt{15}+2\sqrt{5\left(65750+37960\sqrt{3}-29393\sqrt{5}-16970\sqrt{15}\right)}\right)\wedge(1/5)$$

$$\left(568+325\sqrt{3}-260\sqrt{5}-150\sqrt{15}+\sqrt{1+\left(568+325\sqrt{3}-260\sqrt{5}-150\sqrt{15}\right)^2}\right)\wedge(1/5)$$

Minimal polynomial:

$$x^{40}-4544x^{35}-196028x^{30}+5407808x^{25}-29175930x^{20}-5407808x^{15}-196028x^{10}+4544x^5+1$$

Continued fraction:

$$\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{27+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

((3+sqrt5+(sqrt(15+6sqrt5))))^1/5

Input:

$$\sqrt[5]{3+\sqrt{5}+\sqrt{15+6\sqrt{5}}}$$

Decimal approximation:

1.602464692075199162701844965538622490476260432697997939681...

1.6024646920751991627… result practically equal to the elementary charge without exponent

Alternate form:

$$\sqrt[5]{3+\sqrt{5}+\sqrt{3\left(5+2\sqrt{5}\right)}}$$

Minimal polynomial:

$$x^{20}-12x^{15}+14x^{10}+12x^{5}+1$$

Continued fraction:

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{21+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

((3-sqrt5+(sqrt(3*(5-2sqrt5)))))^1/5

Input:

$$\sqrt[5]{3-\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}$$

Decimal approximation:

1.1512532253508328497251975828975786279999828438381825809 67…

1.1512532253508328497…

Alternate form:

$$\sqrt[5]{\sqrt{15-6\sqrt{5}}-\sqrt{5}+3}$$

Minimal polynomial:

$$x^{20}-12x^{15}+14x^{10}+12x^{5}+1$$

Continued fraction:

$$1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{46+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{14+\cfrac{1}{17+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

(((((((-3+5sqrt5+(30(5-sqrt5))^1/2)))^1/5)))) / (2)^(2/5)

Input:

$$\frac{\sqrt[5]{-3+5\sqrt{5}+\sqrt{30\left(5-\sqrt{5}\right)}}}{2^{2/5}}$$

Decimal approximation:

1.340072390306138126503073359233198144708174724298375381579...

1.340072390306138126...

Alternate forms:

$$\frac{1}{2}\sqrt[5]{\sqrt{30\left(5-\sqrt{5}\right)}+5\sqrt{5}-3}\ 2^{3/5}$$

root of $x^{20}+3x^{15}-31x^{10}-3x^5+1$ near $x = 1.34007$

Minimal polynomial:

$$x^{20}+3x^{15}-31x^{10}-3x^5+1$$

Continued fraction:

$$1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{185+\cfrac{1}{42+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

(((((((-3-5sqrt5+(30(5+sqrt5))^1/2)))^1/5)))) / (2)^(2/5)

Input:

$$\frac{\sqrt[5]{-3-5\sqrt{5}+\sqrt{30\left(5+\sqrt{5}\right)}}}{2^{2/5}}$$

Decimal approximation:

0.6732714993778388823005170398995656548800026515140201298 20...

0.673271499377838….

Alternate forms:

$$\frac{1}{2}\sqrt[5]{\sqrt{30\left(5+\sqrt{5}\right)}-5\sqrt{5}-3}\ 2^{3/5}$$

root of $x^{20}+3x^{15}-31x^{10}-3x^{5}+1$ near $x = 0.673271$

Minimal polynomial:

$$x^{20}+3x^{15}-31x^{10}-3x^{5}+1$$

Continued fraction:

$$\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{16+\cfrac{1}{2+\cfrac{1}{23+\cfrac{1}{121+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{422+\cfrac{1}{3+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{14+\cfrac{1}{1+\cfrac{1}{28+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

(((((((9-sqrt5+3(2(5-sqrt5))^1/2)))^1/5)))) / (2)^(1/5)

Input:

$$\frac{\sqrt[5]{9-\sqrt{5}+3\sqrt{2\left(5-\sqrt{5}\right)}}}{\sqrt[5]{2}}$$

Result:

$$\frac{1}{\sqrt[5]{\frac{2}{9-\sqrt{5}+3\sqrt{2\left(5-\sqrt{5}\right)}}}}$$

Decimal approximation:

1.471902301378904420947426661552190226273647097370390670799...

1.471902301378904420.....

Alternate forms:

$$\frac{1}{2}\sqrt[5]{3\sqrt{2\left(5-\sqrt{5}\right)}-\sqrt{5}+9}\ 2^{4/5}$$

$$\sqrt[5]{\frac{1}{2}\left(9-\sqrt{5}+3\sqrt{10-2\sqrt{5}}\right)}$$

$$\sqrt[5]{\text{root of } x^4 - 18x^3 + 74x^2 + 18x + 1 \text{ near } x = 6.90868}$$

Minimal polynomial:

$$x^{20} - 18x^{15} + 74x^{10} + 18x^5 + 1$$

Continued fraction:

$$1 + \cfrac{1}{2 + \cfrac{1}{8 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{15 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{4 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{1 + \cfrac{1}{29 + \cfrac{1}{17 + \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{7 + \cfrac{1}{5 + \cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

[((((((((1/8(((81+45sqrt5+25(sqrt(38+18sqrt5)))))))^2+1)))))^1/2 - (((1/8(((81+45sqrt5+25(sqrt(38+18sqrt5))))))))]^(1/5)

Input:

$$\sqrt[5]{\sqrt{\left(\frac{1}{8}\left(81 + 45\sqrt{5} + 25\sqrt{38 + 18\sqrt{5}}\right)\right)^2 + 1} - \frac{1}{8}\left(81 + 45\sqrt{5} + 25\sqrt{38 + 18\sqrt{5}}\right)}$$

Exact result:

$$\left(\frac{1}{8}\left(-81 - 45\sqrt{5} - 25\sqrt{38 + 18\sqrt{5}}\right) + \sqrt{1 + \frac{1}{64}\left(81 + 45\sqrt{5} + 25\sqrt{38 + 18\sqrt{5}}\right)^2}\right)^{\wedge}(1/5)$$

Decimal approximation:

0.3975503219731031661624323231060385984303008747878887343768...

0.397550321973103166…..

Alternate forms:

$$\sqrt[5]{\text{root of } x^8+81x^7-1778x^6+19683x^5-107805x^4-19683x^3-1778x^2-81x+1 \text{ near } x=0.00993026}$$

$$\frac{1}{2^{3/5}}\left(\left(-81-45\sqrt{5}-25\sqrt{2\left(19+9\sqrt{5}\right)}+3\sqrt{10\left(450+206\sqrt{5}+45\sqrt{2\left(19+9\sqrt{5}\right)}+25\sqrt{10\left(19+9\sqrt{5}\right)}\right)}\right)\hat{}(1/5)\right)$$

$$\frac{1}{2^{7/10}}\left(\left(-25\sqrt{38-4i\sqrt{11}}-\sqrt{2}\left(81+45\sqrt{5}+25\sqrt{i\left(2\sqrt{11}+-19i\right)}\right)+\sqrt{\left(5\left(-500i\sqrt{11}+10\sqrt{2\left(38-4i\sqrt{11}\right)}\left(81+45\sqrt{5}+25\sqrt{i\left(2\sqrt{11}+-19i\right)}\right)+4\left(4050+729\sqrt{5}+125i\sqrt{11}+45\left(9+5\sqrt{5}\right)\sqrt{i\left(2\sqrt{11}+-19i\right)}\right)\right)\right)}\right)\hat{}(1/5)\right)$$

Minimal polynomial:

$$x^{40}+81x^{35}-1778x^{30}+19683x^{25}-107805x^{20}-19683x^{15}-1778x^{10}-81x^5+1$$

Continued fraction:

$$\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{31+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{21+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

1/2[(((((((sqrt65+7)^1/2) – (sqrt65-1)^1/2)*sqrt5))/ (((((((sqrt65+9)^1/2) – (sqrt65+7)^1/2)*2))))))^3-11]

Input:

$$\frac{1}{2}\left(\left(\left(\frac{\left(\sqrt{\sqrt{65}+7}-\sqrt{\sqrt{65}-1}\right)\sqrt{5}}{\left(\sqrt{\sqrt{65}+9}-\sqrt{\sqrt{65}+7}\right)\times 2}\right)\right)^3-11\right)$$

Exact result:

$$\frac{1}{2}\left(\frac{5\sqrt{5}\left(\sqrt{7+\sqrt{65}}-\sqrt{\sqrt{65}-1}\right)^3}{8\left(\sqrt{9+\sqrt{65}}-\sqrt{7+\sqrt{65}}\right)^3}-11\right)$$

Decimal approximation:

76.77116559762173762472407948396825354078251084656824071086...

Alternate forms:

root of
$x^8+12494x^7-847203x^6-7374258x^5-96224680x^4-2214196942x^3-19686288803x^2-73531567694x-101008925599$ near $x=76.7712$

$$\frac{1}{2}\left(\frac{5\sqrt{5}\left(\sqrt{\sqrt{65}-1}-\sqrt{7+\sqrt{65}}\right)^3}{8\left(\sqrt{7+\sqrt{65}}-\sqrt{9+\sqrt{65}}\right)^3}-11\right)$$

$$\left(-25\sqrt{5\left(\sqrt{65}-1\right)}-25\sqrt{13\left(\sqrt{65}-1\right)}+88\sqrt{7+\sqrt{65}}+5\sqrt{5\left(7+\sqrt{65}\right)}+25\sqrt{13\left(7+\sqrt{65}\right)}\right)\Big/\left(4\left(\sqrt{9+\sqrt{65}}-\sqrt{7+\sqrt{65}}\right)^3\right)-\frac{11\left(15+2\sqrt{65}\right)}{\left(\sqrt{9+\sqrt{65}}-\sqrt{7+\sqrt{65}}\right)^2}$$

Minimal polynomial:

$$x^8+12494x^7-847203x^6-7374258x^5-96224680x^4-2214196942x^3-19686288803x^2-73531567694x-101008925599$$

((((((76.771165597621737624724^2+1))^1/2-76.771165597621737624724))))^1/5

Input interpretation:

$$\sqrt[5]{\sqrt{76.771165597621737624724^2+1}-76.771165597621737624724}$$

Result:

0.3653849793177824269...

0.3653849793177824269…

Continued fraction:

$$\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1015+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{58+\cfrac{1}{\ldots}}}}}}}}}}}}}$$

From this sum, we obtain:

0.98215156455 + 1.53343393353167 + 0.48731297839151 + 1.584291893060286 + 1.5658292280247776 + 0.43687994188884049930 + 1.6024646920751991627

Input interpretation:

0.98215156455 + 1.53343393353167 + 0.48731297839151 + 1.584291893060286 + 1.5658292280247776 + 0.43687994188884049930 + 1.6024646920751991627

Result:

8.192364231522283262

8.192364231522283262

(8.192364231522283262 + 1.1512532253508328497 + 1.340072390306138126 + 0.673271499377838 + 1.47190230137890442 + 0.397550321973103166 + 0.3653849793177824269)

Input interpretation:

8.192364231522283262 + 1.1512532253508328497 + 1.340072390306138126 + 0.673271499377838 + 1.47190230137890442 + 0.397550321973103166 + 0.3653849793177824269

Result:

13.5917989492268822511

13.5917989492268822511

In atomic physics, **Rydberg unit of energy**, symbol Ry, corresponds to the energy of the photon whose wavenumber is the Rydberg constant, i.e. the ionization energy of the hydrogen atom.

$$1\ \mathrm{Ry} \equiv hcR_\infty = \frac{m_e e^4}{8\varepsilon_0^2 h^2} = 13.605\ 693\ 009(84)\ \mathrm{eV} \approx 2.179 \times 10^{-18}\ \mathrm{J}.$$

We have also:

Input interpretation:

1.1512532253508328497 × 1.340072390306138126 × 0.673271499377838 × 1.47190230137890442 × 0.397550321973103166 × 0.3653849793177824269

Result:

0.22208086156650057148475681005655802895747711677617791 7321...

0.22208086156650057 1…

Input interpretation:

$0.98215156455 \times 1.53343393353167 \times 0.48731297839151 \times 1.584291893060286 \times 1.5658292280247776 \times 0.43687994188888404993 \times 1.6024646920751991627$

Result:

1.2746229406132914930364347366558649965689074351924709238 54...

1.27462294061329….

Input interpretation:

$0.222080861566500571484756810056558028957477116776177917321 \times 1.274622940613291493036434736655864996568907435192470923854$

Result:

0.283069360823826267102517802398034350207117652397036200187...

0.283069360823826…..

And:

1/0.98215156455 + 1/1.53343393353167 + 1/0.48731297839151 + 1/1.584291893060286 + 1/1.5658292280247776 + 1/0.43687994188888404993 + 1/1.6024646920751991627

Input interpretation:

$$\frac{1}{0.98215156455} + \frac{1}{1.53343393353167} + \frac{1}{0.48731297839151} + \frac{1}{1.584291893060286} + \frac{1}{1.5658292280247776} + \frac{1}{0.43687994188888404993} + \frac{1}{1.6024646920751991627}$$

Result:

7.905206359518329467967784264198793045502344235017542302462...

7.90520635951832946…..

(1/1.1512532253508328497 + 1/1.3400723903061381265 + 1/0.673271499377838 + 1/1.47190230137890442 + 1/0.3975503219731031 66 + 1/0.3653849793177824269)

Input interpretation:

$$\frac{1}{1.1512532253508328497}+\frac{1}{1.3400723903061381265}+\frac{1}{0.673271499377838}+\frac{1}{1.47190230137890442}+\frac{1}{0.397550321973103166}+\frac{1}{0.3653849793177824269}$$

Result:

9.031769013934306462087446035243170079654329298316796820387...

9.0317690139343064….

(7.905206359518329467967784264198793045502344235017542302462 + 9.031769013934306462087446035243170079654329298316796820387)

Input interpretation:

7.905206359518329467967784264198793045502344235017542302462 + 9.031769013934306462087446035243170079654329298316796820387

Result:

16.936975373452635930055230299441963125156673533334339122284...

Repeating decimal:

16.93697537345263593005523029944196312515667353333433912284$\overline{9}$

16.9369753734526…. result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

We have that:

(8.192364231522283262 + 1.1512532253508328497 + 1.3400723903061381265 + 0.673271499377838 + 1.47190230137890442 + 0.397550321973103166 + 0.3653849793177824269)^3 +7

Where 7 is a Lucas number

Input interpretation:

$$(8.192364231522283262+1.1512532253508328497+1.3400723903061381265+0.673271499377838+1.47190230137890442+0.397550321973103166+0.3653849793177824269)^3+7$$

Result:

2517.908144490570791187700846063198954587925846619788913818...

2517.90814449..... result practically equal to the rest mass of charmed Sigma baryon 2517.9

(8.192364231522283262 + 1.1512532253508328497 + 1.3400723903061381265 + 0.673271499377838 + 1.47190230137890442 + 0.397550321973103166 + 0.3653849793177824269)^3 -728

Where 728 = $9^3 - 1$ (Ramanujan cube)

Input interpretation:

$$(8.192364231522283262 + 1.1512532253508328497 + 1.3400723903061381265 + 0.673271499377838 + 1.47190230137890442 + 0.397550321973103166 + 0.3653849793177824269)^3 - 728$$

Result:

1782.908144490570791187700846063198954587925846619788913818...

Repeating decimal:

1782.908144490570791187700846063198954587925846619788913818831

1782.90814..... result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)^3 -744-34-Pi-1/golden ratio

Input interpretation:

$$(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)^3 - 744 - 34 - \pi - \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1729.14852...

1729.14852…

This result is very near to the mass of candidate glueball $f_0(1710)$ meson. Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. As a consequence, it is sometimes called a Zagier as a pun on the Gross–

Zagier theorem. The number 1728 is one less than the Hardy–Ramanujan number 1729

Alternative representations:

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=-778-\pi+13.5918^3--\frac{1}{2\cos(216\,°)}$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=-778-180\,°+13.5918^3--\frac{1}{2\cos(216\,°)}$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=-778-\pi+13.5918^3-\frac{1}{2\cos\left(\frac{\pi}{5}\right)}$$

Series representations:

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=1732.91-\frac{1}{\phi}-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=1734.91-\frac{1}{\phi}-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=1732.91-\frac{1}{\phi}-\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=1732.91-\frac{1}{\phi}-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=1732.91-\frac{1}{\phi}-4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-744-34-\pi-\frac{1}{\phi}=1732.91-\frac{1}{\phi}-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)^3 -1729+1/golden ratio

Input interpretation:

$$(8.192364231+1.151253225+1.340072390+0.673271499+1.471902301+0.397550321+0.365384979)^3-1729+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

782.526177...

782.526177… result practically equal to the rest mass of Omega meson 782.65

Alternative representations:

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-1729+\frac{1}{\phi}=-1729+13.5918^3+\frac{1}{2\sin(54°)}$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-1729+\frac{1}{\phi}=-1729+13.5918^3+-\frac{1}{2\cos(216°)}$$

$$(8.19236+1.15125+1.34007+0.673271+1.4719+0.39755+0.365385)^3-1729+\frac{1}{\phi}=-1729+13.5918^3+-\frac{1}{2\sin(666°)}$$

(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)^2 * golden ratio^2

Input interpretation:

$$(8.192364231+1.151253225+1.340072390+0.673271499+1.471902301+0.397550321+0.365384979)^2\,\phi^2$$

ϕ is the golden ratio

Result:

483.647741...

483.647741… result practically equal to Holographic Ricci dark energy model, where

$\chi^2_{\mathrm{RDE}} = 483.130.$

Alternative representations:

$(8.19236 + 1.15125 + 1.34007 + 0.673271 + 1.4719 + 0.39755 + 0.365385)^2 \phi^2 = 13.5918^2 (2 \sin(54°))^2$

$(8.19236 + 1.15125 + 1.34007 + 0.673271 + 1.4719 + 0.39755 + 0.365385)^2 \phi^2 = 13.5918^2 (-2 \cos(216°))^2$

$(8.19236 + 1.15125 + 1.34007 + 0.673271 + 1.4719 + 0.39755 + 0.365385)^2 \phi^2 = 13.5918^2 (-2 \sin(666°))^2$

(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)*11-7-e

Input interpretation:

$(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979) \times 11 - 7 - e$

Result:

139.7915066...

139.7915066... result practically equal to the rest mass of Pion meson 139.57 MeV

(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)*11-18-2Pi

Input interpretation:

$(8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979) \times 11 - 18 - 2\pi$

Result:

125.2266031...

125.2266031... result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

1/10^52 ((((8.192364231 + 1.151253225 + 1.340072390 + 0.673271499 + 1.471902301 + 0.397550321 + 0.365384979)/11 - 13/10^2)))

Input interpretation:

$$\frac{1}{10^{52}}\left(\frac{1}{11}(8.192364231+1.151253225+1.340072390+0.673271499+1.471902301+0.397550321+0.365384979)-\frac{13}{10^2}\right)$$

Result:

$1.105618086\times 10^{-52}$

1.105618086 * 10^{-52} result practically equal to the value of Cosmological Constant 1.1056*10^{-52} m^{-2}

With regard 744, we have that:

Several remarkable properties of j have to do with its q-expansion (Fourier series expansion), written as a Laurent series in terms of $q = e^{2\pi i\tau}$ (the square of the nome), which begins:

$$j(\tau) = q^{-1} + 744 + 196884q + 21493760q^2 + 864299970q^3 + 20245856256q^4 + \cdots$$

Note that j has a simple pole at the cusp, so its q-expansion has no terms below q^{-1}.

All the Fourier coefficients are integers, which results in several almost integers, notably Ramanujan's constant:

$$e^{\pi\sqrt{163}} \approx 640320^3 + 744.$$

Thence:

744 = e^(Pi*sqrt163)-640320^3

Indeed:

e^(Pi*sqrt163)-640320^3

Input:

$e^{\pi\sqrt{163}} - 640\,320^3$

Exact result:

$e^{\sqrt{163}\,\pi} - 262\,537\,412\,640\,768\,000$

Decimal approximation:

743.99999999999925007259719818568887935385633733699086270 75...

743.999… ≈ 744

Property:

$-262537412640768000+e^{\sqrt{163}\,\pi}$ is a transcendental number

Series representations:

$$e^{\pi\sqrt{163}}-640320^3=-262537412640768000+e^{\pi\sqrt{162}\sum_{k=0}^{\infty}162^{-k}\binom{1/2}{k}}$$

$$e^{\pi\sqrt{163}}-640320^3=-262537412640768000+e^{\pi\sqrt{162}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{162}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}$$

$$e^{\pi\sqrt{163}}-640320^3=$$
$$-262537412640768000+\exp\left(\frac{\pi\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\,162^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)$$

References

Highly composite numbers
Proceedings of the London Mathematical Society, 2, XIV, 1915, 347 – 409