On some equations concerning "*Power-law Inflation*" (*Lucchin-Matarrese attractor solution*). Possible mathematical connections with various expressions of Number Theory

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Abstract

*In this research thesis, we have analyzed some equations concerning "Power-law Inflation" (Lucchin-Matarrese attractor solution)***.** *We describe the possible mathematical connections with various expressions of Number Theory*

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We want to highlight that the development of the various equations was carried out according an our possible logical and original interpretation

From:

THE THREE–POINT CORRELATION FUNCTION OF THE COSMIC MICROWAVE BACKGROUND IN INFLATIONARY MODELS

Alejandro Gangui, Francesco Lucchin, Sabino Matarrese and Silvia Mollerach

arXiv:astro-ph/9312033v1 15 Dec 1993

We have that:

4.1 Inflationary models

Let us now specialize our general expressions to some simple inflationary models.

Exponential potential

Let us first consider power–law inflation driven by the exponential potential $V(\phi) = V_0 \exp(-\lambda\kappa\phi)$, with $\lambda < \sqrt{2}$ (Lucchin & Matarrese 1985). In this case the power–spectrum is an exact power–law with $n = 1 - 2\lambda^2/(2-\lambda^2)$. We note in passing that the right spectral dependence of the perturbations can be recovered using the above stochastic approach (Mollerach et al. 1991). For this model we find $X = -\sqrt{8\pi}\lambda$, whose constant value implies $A = B = 0$. We then have

$$\mathcal{S}_1 = \frac{3\lambda}{4}\frac{H_{60}}{m_P}\,\mathcal{I}_{3/2}(n)\left[\frac{\Gamma(3-n)\Gamma\left(\frac{3}{2}+\frac{n}{2}\right)}{\left[\Gamma\left(2-\frac{n}{2}\right)\right]^2\Gamma(\frac{9}{2}-\frac{n}{2})}\right]^{1/2} \quad ; \quad \mathcal{S}_2 = \frac{15}{2}\lambda^2\,\mathcal{I}_2(n)\ . \qquad (39)$$

The COBE results constrain the amplitude of H_{60}. For the case $n = 0.8$ we have $H_{60}/m_P = 1.8\times10^{-5}$. This gives $\mathcal{S}_1 = 9.7\times10^{-6}$ and $\mathcal{S}_1 = 1.1\times10^{-5}$, without and with the quadrupole contribution respectively, while $\mathcal{S}_2 = 1.3$ in both cases.

For $\lambda = 5/4$ and the above data, from

$$\mathcal{S}_1 = \frac{3\lambda}{4}\frac{H_{60}}{m_P}\,\mathcal{I}_{3/2}(n)\left[\frac{\Gamma(3-n)\Gamma\left(\frac{3}{2}+\frac{n}{2}\right)}{\left[\Gamma\left(2-\frac{n}{2}\right)\right]^2\Gamma(\frac{9}{2}-\frac{n}{2})}\right]^{1/2}$$

We obtain:

3*5/4*1/4*(1.8e-5) * x *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5 = 9.7e-6

Input interpretation:

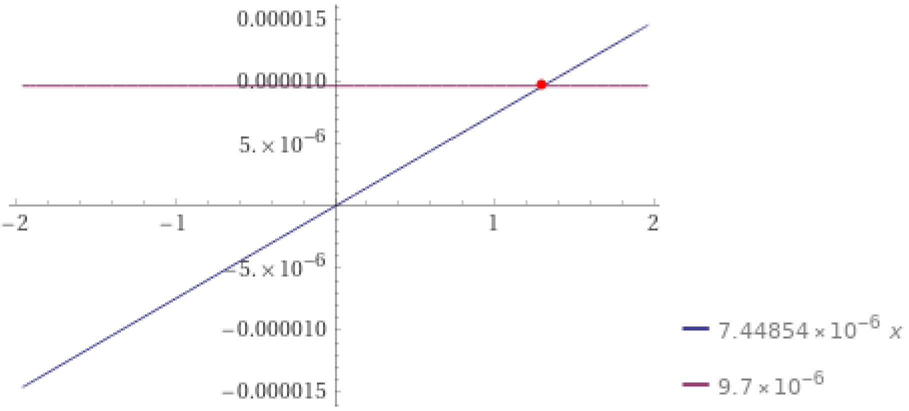
$$3\times\frac{5}{4}\times\frac{1}{4}\times1.8\times10^{-5}\,x\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}} = 9.7\times10^{-6}$$

$\Gamma(x)$ is the gamma function

Result:

$$7.44854\times10^{-6}\,x = 9.7\times10^{-6}$$

Plot:



Alternate form:

$7.44854\times10^{-6}\,x - 9.7\times10^{-6} = 0$

Alternate form assuming x is real:

$7.44854\times10^{-6}\,x + 0 = 9.7\times10^{-6}$

Solution:

$x \approx 1.30227$

1.30227

And:

3*5/4*1/4*(1.8e-5) * x *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5 = 1.1e-5

Input interpretation:

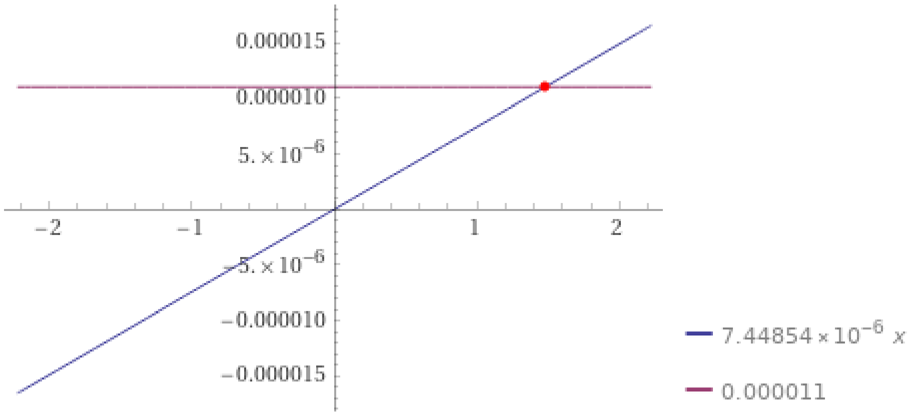
$$3\times\frac{5}{4}\times\frac{1}{4}\times1.8\times10^{-5}\,x\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}} = 1.1\times10^{-5}$$

$\Gamma(x)$ is the gamma function

Result:

$7.44854\times10^{-6}\,x = 0.000011$

Plot:



Alternate form:

$7.44854\times10^{-6}\,x-0.000011=0$

Alternate form assuming x is real:

$7.44854\times10^{-6}\,x+0=0.000011$

Solution:

$x\approx1.4768$

1.4768

Indeed:

3*5/4*1/4*(1.8e-5) * 1.30227 *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5

Input interpretation:

$$3\times\frac{5}{4}\times\frac{1}{4}\times1.8\times10^{-5}\times1.30227\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}}$$

$\Gamma(x)$ is the gamma function

Result:

9.700009802405044595330128727148978470759548745422015723588 1… × 10^{-6}

9.7000098024…*10^-6

3*5/4*1/4*(1.8e-5) * 1.4768 *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5

Input interpretation:

$$3\times\frac{5}{4}\times\frac{1}{4}\times 1.8\times 10^{-5}\times 1.4768\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}}$$

$\Gamma(x)$ is the gamma function

Result:

0.0000110000…

Result:

1.10000×10^{-5}

1.1*10^-5

From

$$\mathcal{S}_2 = \frac{15}{2}\,\lambda^2\,\mathcal{I}_2(n)$$

1.3 = 15/2 * (5/4)^2 * x

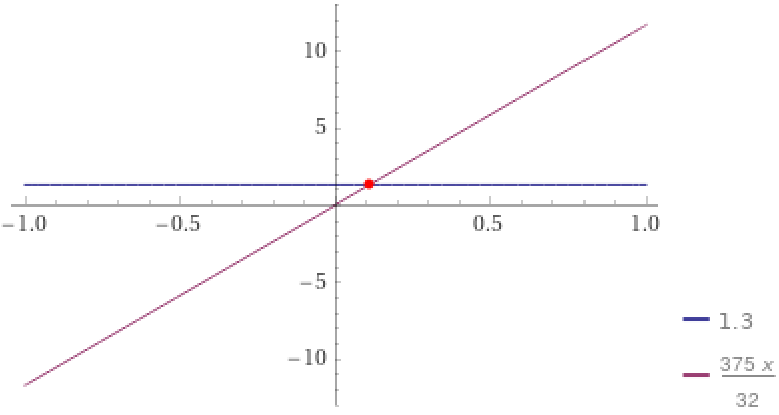
Input:

$$1.3 = \frac{15}{2}\left(\frac{5}{4}\right)^2 x$$

Result:

$$1.3 = \frac{375\,x}{32}$$

Plot:



Alternate form:

$$1.3 - \frac{375\,x}{32} = 0$$

Solution:

$x \approx 0.110933$

0.110933

Indeed:

15/2 * (5/4)^2 * 0.110933

Input interpretation:

$$\frac{15}{2}\left(\frac{5}{4}\right)^2 \times 0.110933$$

Result:

1.29999609375

1.29999609375 ≈ 1.3

The mean between the two results, is:

1/2(((3*5/4*1/4*(1.8e-5) * 1.30227 *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5 + 0.0000110000034372225 19)))

Input interpretation:

$$\frac{1}{2}\left(3\times\frac{5}{4}\times\frac{1}{4}\times 1.8\times 10^{-5}\times 1.30227\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}}+0.000011000003437222519\right)$$

$\Gamma(x)$ is the gamma function

Result:

0.000010350006619813781797665064363574489235379774372711007861794 0…

Result:

$1.035000661981378179766506436357448923537977437271100 78\times 10^{-5}$

$1.0350006619\ldots{}^{*}10^{-5}$

From which:

-[ln(((1/2(((3*5/4*1/4*(1.8e-5) * 1.30227 *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5 + 0.000011000003437222519))))))]^1/5

Input interpretation:

$$-\log\left(\frac{1}{2}\left(3\times\frac{5}{4}\times\frac{1}{4}\times 1.8\times 10^{-5}\times 1.30227\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}}+0.000011000003437222519\right)\right)\hat{}\,(1/5)$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

Result:

$-1.3180590\ldots - 0.95762591\ldots\, i$

Polar coordinates:

$r = 1.62921$ (radius), $\theta = -144°$ (angle)

1.62921 result very near to the mean between $\zeta(2) = \frac{\pi^2}{6} = 1.644934$ ... and the value of golden ratio 1.61803398…, i.e. 1.63148399

We have also:

1/((-[ln(((1/2(((3*5/4*1/4*(1.8e-5) * 1.30227 *[((gamma(3-0.8) gamma(3/2+0.8/2))) / ([(gamma(2-0.8/2))]^2 gamma(9/2-0.8/2))]^0.5 + 0.00001100000343))))))]^1/5 - 1))^1/32

Input interpretation:

$$1\left/\left(\left(-\log\left(\frac{1}{2}\left(3\times\frac{5}{4}\times\frac{1}{4}\times 1.8\times 10^{-5}\times 1.30227\sqrt{\frac{\Gamma(3-0.8)\,\Gamma\left(\frac{3}{2}+\frac{0.8}{2}\right)}{\Gamma\left(2-\frac{0.8}{2}\right)^2\,\Gamma\left(\frac{9}{2}-\frac{0.8}{2}\right)}}+0.00001100000343\right)\right)\text{ ^ }(1/5)-1\right)\text{ ^ }(1/32)\right)\right.$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

Result:

$0.968088666\ldots +$
$0.0833953895\ldots\, i$

Polar coordinates:

$r = 0.971674$ (radius), $\theta = 4.92355°$ (angle)

0.971674 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 Omega mesons (ω/ω_3 | $5+3$ | $m_{u/d} = 255 - 390$ | $0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243 = \phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or ’glueballs’).

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories** - *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

From

POWER-LAW INFLATION

F. Lucchin - Dipartimento di Fisica "G. Galilei ",Via Marzolo 8, 35100 Padova, Italy And *S. Matarrese* - International School for Advanced Studies (ISAS), Strada Costiera 11, 34014 Trieste Italy - December 1984

We have that:

The isotropy of the cosmic background radiation then implies

$$\frac{4}{\pi^{1/2}} 10^{-1} \left(\frac{3}{4}\right)^{\frac{1}{p-1}} p^{(3p-1)/2(p-1)} 10^{27/(p-1)} \tau^{-(2p-1)/2(p-1)} 10^{7/3(p-1)} < 10^{-4}, \quad (4.11a)$$

the galaxy formation constraint yields

$$\frac{4}{\pi^{1/2}} p^{(3p-1)/2(p-1)} 10^{27/(p-1)} \tau^{-(2p-1)/2(p-1)} 10^{-1/(p-1)} \gtrsim 10^{-5}. \quad (4.11b)$$

Equations (4.11) are satisfied for any p > 1.9 provided

$$p^{(3p-1)/(2p-1)} 10^{5(4p+31)/3(2p-1)} < \tau \lesssim p^{(3p-1)/(2p-1)} 10^{4(8p+33)/3(2p-1)} , \quad (4.12)$$

From:

$$\frac{4}{\pi^{1/2}} 10^{-1} \left(\frac{3}{4}\right)^{\frac{1}{p-1}} p^{(3p-1)/2(p-1)} 10^{27/(p-1)} \tau^{-(2p-1)/2(p-1)} 10^{7/3(p-1)} < 10^{-4}; \quad (4.11a)$$

For:

$p = 2, \quad \tau = 10^{21}$

4/sqrt(Pi)*10^-1*(3/4) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^(7/3) < 10^-4

Input:

$$\frac{\frac{4}{\sqrt{\pi}} \times \frac{3}{4} \times 2^{5/2} \times 10^{27} \times 10^{7/3}}{10\left(10^{21}\right)^5} < \frac{1}{10^4}$$

Result:

True

we obtain:

4/sqrt(Pi)*10^-1*(3/4) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^(7/3)

Input:

$$\frac{\frac{4}{\sqrt{\pi}} \times \frac{3}{4} \times 2^{5/2} \times 10^{27} \times 10^{7/3}}{10\left(10^{21}\right)^5}$$

Exact result:

$$3 / \left(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \sqrt[6]{2}\; 5^{2/3} \sqrt{\pi}\right)$$

Decimal approximation:

$2.0627882117214562841274117184236914796713569743859294604914\ldots \times 10^{-76}$

$2.0627882117\ldots * 10^{-76}$

Property:

$$3/\left(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right) \text{ is a transcendental number}$$

Series representations:

$$\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}{(10\sqrt{\pi}\,(10^{21})^5)\,4} = 3/\left(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,\sqrt[6]{2}\;5^{2/3}\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)$$

$$\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}{(10\sqrt{\pi}\,(10^{21})^5)\,4} = 3/\left(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,\sqrt[6]{2}\;5^{2/3}\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k\,(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}{(10\sqrt{\pi}\,(10^{21})^5)\,4} = (3\sqrt{\pi})/\left(1\,250\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,\sqrt[6]{2}\;5^{2/3}\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\!\left(-\frac{1}{2}-s\right)\Gamma(s)\right)$$

From which:

ln[1/(((4/sqrt(Pi)*10^-1*(3/4) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^(7/3))))]

Input:

$$\log\left(\frac{1}{\frac{\frac{4}{\sqrt{\pi}}\times\frac{3}{4}\times 2^{5/2}\times 10^{27}\times 10^{7/3}}{10\,(10^{21})^5}}\right)$$

log(x) is the natural logarithm

Exact result:

$$\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)$$

Decimal approximation:

174.27240849906689623017939966090981814707185397427352969460888958…

174.272408499…

Alternate forms:

$$\frac{\log(2)}{6}+\frac{2\log(5)}{3}+\log(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)+\frac{\log(\pi)}{2}$$

$$\frac{1}{6}(445\log(2)-2(3\log(3)-230\log(5))+3\log(\pi))$$

$$\frac{1}{6}(445\log(2)-6\log(3)+460\log(5)+3\log(\pi))$$

Alternative representations:

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = \log_e\left(\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\,\sqrt{\pi}}}\right)$$

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = \log(a)\log_a\left(\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\,\sqrt{\pi}}}\right)$$

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = -\text{Li}_1\left(1-\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\,\sqrt{\pi}}}\right)$$

Series representations:

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = \log\Big(-1 + (2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots\, 000\,000\,000\,000\,000\,000\,000\,000\,000/3)\,\sqrt[6]{2}\,5^{2/3}\,\sqrt{\pi}\Big) - \sum_{k=1}^{\infty}\frac{1}{k}3^k\left(1\Big/\Big(3 - 2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots\, 000\,000\,000\,000\,000\,000\,000\,000\,000\,000\;\sqrt[6]{2}\,5^{2/3}\,\sqrt{\pi}\Big)\right)^k$$

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = 2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor + \log(z_0) - \sum_{k=1}^{\infty}\frac{1}{k}(-1)^k \left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi} - z_0\right)^k z_0^{-k}$$

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = 2\,i\,\pi\left\lfloor\frac{1}{2\,\pi}\arg\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi} - x\right)\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{1}{k}(-1)^k \left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi} - x\right)^k x^{-k} \quad \text{for } x < 0$$

Integral representations:

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = \int_1^{\frac{2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}{3}\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}} \frac{1}{t}\,dt$$

$$\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}\,(10^{21})^5)4}}\right) = -\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\Gamma(1-s)}\left(-1+\right.$$

$$\left.(2500000000000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)\,ds \quad \text{for } -1<\gamma<0$$

And:

1+(((1/(((ln[1/(((4/sqrt(Pi)*10^-1*(3/4) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^(7/3))))]))))^1/11)))

Input:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{\frac{4}{\sqrt{\pi}}\times\frac{3}{4}\times 2^{5/2}\times 10^{27}\times 10^{7/3}}{10\,(10^{21})^5}}\right)}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$1+1\Big/\left(\log\left((2500000000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)^\wedge(1/11)\right)$$

Decimal approximation:

1.625535472470895407450828861592098289891180867717861147066693923 2

...

1.625535472…. result very near to the mean between $\zeta(2) = \frac{\pi^2}{6} = 1.644934$ ... and the value of golden ratio 1.61803398…, i.e. 1.63148399

Alternate forms:

$$1 + 1 \Big/ \left(\left(\frac{\log(2)}{6} + \frac{2\log(5)}{3} + \log(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000\,000 / 3) + \frac{\log(\pi)}{2}\right)\text{^}(1/11)\right)$$

$$1 + \sqrt[11]{\frac{6}{445\log(2) - 2\,(3\log(3) - 230\log(5)) + 3\log(\pi)}}$$

$$\left(1 + \log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000 / 3)\,\sqrt[6]{2}\;5^{2/3}\,\sqrt{\pi}\right)\text{^}(1/11)\right) \Big/ \left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000 / 3)\,\sqrt[6]{2}\;5^{2/3}\,\sqrt{\pi}\right)\text{^}(1/11)\right)$$

Alternative representations:

$$1 + \frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{\left(10\,\sqrt{\pi}\,(10^{21})^5\right)4}}\right)}} = 1 + \frac{1}{\sqrt[11]{\log_e\left(\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}}{\left(10\,\sqrt{\pi}\,\left(10^{21}\right)^5\right)4}\right)}} = 1+\frac{1}{\sqrt[11]{\log(a)\log_a\left(\frac{\frac{1}{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}}{4\times 10\,\left(10^{21}\right)^5\sqrt{\pi}}\right)}}$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}}{\left(10\,\sqrt{\pi}\,\left(10^{21}\right)^5\right)4}\right)}} = 1+\frac{1}{\sqrt[11]{-\mathrm{Li}_1\left(1-\frac{\frac{1}{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}}{4\times 10\,\left(10^{21}\right)^5\sqrt{\pi}}\right)}}$$

Series representations:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}}{\left(10\,\sqrt{\pi}\,\left(10^{21}\right)^5\right)4}\right)}} = 1+1\Big/\left(\left(\log\left(-1+\left(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\right/\right.\right.\right.$$
$$\left.\left.\left.3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)-\sum_{k=1}^{\infty}\frac{1}{k}3^k\left(1\Big/\left(3-2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)\right)^k\right)\text{^}(1/11)\right)$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}(10^{21})^5)4}}\right)}} =$$

$$1+1\Bigg/\left(\left(2 i \pi \left\lfloor \frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor + \log(z_0) - \sum_{k=1}^{\infty}\frac{1}{k}(-1)^k \left((2500000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}-z_0\right)^k z_0^{-k}\right)\text{^}(1/11)\right)$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}(10^{21})^5)4}}\right)}} = 1+1\Bigg/\left(\left(2 i \pi \left\lfloor \frac{1}{2\pi}\arg\left((2500000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}-x\right)\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{1}{k}(-1)^k \left((2500000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}-x\right)^k x^{-k}\right)\text{^}(1/11)\right) \quad \text{for } x<0$$

Integral representations:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{(10\sqrt{\pi}(10^{21})^5)4}}\right)}} = 1+1\Bigg/\left(\left(\int_1^{\frac{2500000000000000000000000000000000000000000000000000000000000000000000000000}{3}\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}}\frac{1}{t}\,dt\right)\text{^}(1/11)\right)$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}}{(10\sqrt{\pi}\,(10^{21})^5)4}\right)}} = 1+\left(\sqrt[11]{2\pi}\right)\Big/\left(\left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1}{\Gamma(1-s)}\left(-1+(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)\,ds\right)\hat{}\,(1/11)\right) \text{ for } -1<\gamma<0$$

And also:

((1+(((1/(((ln[1/(((4/sqrt(Pi)*10^-1*(3/4) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^(7/3))))])))^1/11))) – 1))^1/32

Input:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{\frac{4}{\sqrt{\pi}}\times\frac{3}{4}\times 2^{5/2}\times 10^{27}\times 10^{7/3}}{10\,(10^{21})^5}}\right)}}-1}$$

log(x) is the natural logarithm

Exact result:

$$1\Big/\left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\right)\hat{}\,(1/352)\right)$$

Decimal approximation:

0.9854460957440816456176675314621362518506134776602616588882837719
…

0.985446095744….. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the Omega mesons (ω/ω_3 | $5+3$ | $m_{u/d} = 255 - 390$ | $0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243 = \phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Alternate forms:

$$1/((\frac{\log(2)}{6} + \frac{2\log(5)}{3} + \log(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3) + \frac{\log(\pi)}{2})\wedge(1/352))$$

$$\sqrt[352]{\frac{6}{445\log(2) - 2(3\log(3) - 230\log(5)) + 3\log(\pi)}}$$

$$\frac{1}{\sqrt[352]{\frac{445\log(2)}{6} - \log(3) + \frac{230\log(5)}{3} + \frac{\log(\pi)}{2}}}$$

All 32nd roots of 1/log(2500000000000000000000000000000000000000000000000000000000000000000000000000/3 2^(1/6) 5^(2/3) sqrt(π))^(1/11):

$$e^0 / \left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000/3)\ \sqrt[6]{2}\ 5^{2/3}\ \sqrt{\pi}\right) \text{^} (1/352)\right) \approx 0.985446096$$

(real, principal root)

$$e^{(i\pi)/16} / \left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000/3)\ \sqrt[6]{2}\ 5^{2/3}\ \sqrt{\pi}\right) \text{^} (1/352)\right) \approx 0.966511 + 0.19225\, i$$

$$e^{(i\pi)/8} / \left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000/3)\ \sqrt[6]{2}\ 5^{2/3}\ \sqrt{\pi}\right) \text{^} (1/352)\right) \approx 0.91043 + 0.37711\, i$$

$$e^{(3 i\pi)/16} / \left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000/3)\ \sqrt[6]{2}\ 5^{2/3}\ \sqrt{\pi}\right) \text{^} (1/352)\right) \approx 0.81937 + 0.54748\, i$$

$$e^{(i\pi)/4} / \left(\log\left((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots 000\,000\,000\,000\,000\,000\,000\,000/3)\ \sqrt[6]{2}\ 5^{2/3}\ \sqrt{\pi}\right) \text{^} (1/352)\right) \approx 0.69682 + 0.69682\, i$$

Alternative representations:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}}\right)}}-1} = \sqrt[32]{\frac{1}{\sqrt[11]{\log_e\left(\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\sqrt{\pi}}}\right)}}}$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}}\right)}}-1} = \sqrt[32]{\frac{1}{\sqrt[11]{\log(a)\log_a\left(\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\sqrt{\pi}}}\right)}}}$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))\,3}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}}\right)}}-1} = \sqrt[32]{\frac{1}{\sqrt[11]{-\mathrm{Li}_1\left(1-\frac{1}{\frac{12\times 2^{5/2}\times 10^{7/3}\times 10^{27}}{4\times 10\,(10^{21})^5\sqrt{\pi}}}\right)}}}$$

Series representations:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}}\right)}}-1} = 1\Big/\left(\left(\log\left(-1+(2500000000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}\right)-\sum_{k=1}^{\infty}\frac{1}{k}3^k\left(1\Big/\left(3-2500000000000000000000000000000000000000000000000000000000000000000000000000000\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}\right)\right)^k\right)\text{^}(1/352)\right)$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{(4(2^{5/2}\times 10^{27}\times 10^{7/3}))3}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}}\right)}}-1} = 1\Big/\left(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\left((2500000000000000000000000000000000000000000000000000000000000000000000000000000/3)\sqrt[6]{2}\,5^{2/3}\sqrt{\pi}-z_0\right)^k z_0^{-k}\right)\text{^}(1/352)\right)$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))3}}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}\right)}}-1} = 1\Big/\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{1}{2\,\pi}\arg\Big((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}-x\Big)\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\Big((2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}-x\Big)^k x^{-k}\Bigg)\wedge(1/352)\Bigg) \quad \text{for } x<0$$

Integral representations:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))3}}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}\right)}}-1} = 1\Big/\left(\left(\int_1^{\frac{2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}{3}\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}}\frac{1}{t}\,dt\right)\wedge(1/352)\right)$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{\frac{1}{(4\,(2^{5/2}\times 10^{27}\times 10^{7/3}))3}}{\left(10\sqrt{\pi}\,(10^{21})^5\right)4}\right)}}-1} = \left(\sqrt[352]{2\,\pi}\right)\Big/\left(\left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1}{\Gamma(1-s)}\Big(-1+(2\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000/3)\sqrt[6]{2}\;5^{2/3}\sqrt{\pi}\Big)^{-s}\Gamma(-s)^2\,\Gamma(1+s)\,ds\right)\wedge(1/352)\right)$$

for $-1<\gamma<0$

$\Gamma(x)$ is the gamma function

From:

$$\frac{4}{\pi^{1/2}} p^{(3p-1)/2(p-1)} 10^{27/(p-1)} \tau^{-(2p-1)/2(p-1)} 10^{-1/(p-1)} \gtrsim 10^{-5}.$$

for

$p = 2, \quad \tau = 10^{21}$.

We obtain:

4/sqrt(Pi) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^-1

Input:

$$\frac{\frac{4}{\sqrt{\pi}} \times 2^{5/2} \times 10^{27}}{(10^{21})^5 \times 10}$$

Exact result:

$1/$
$(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,$
$000\,000\,000\,000\,000\,000\,\sqrt{2\pi})$

Decimal approximation:

$1.276615297284584569407827391790021979122747619727790904530 9\ldots \times 10^{-78}$

$1.276615297\ldots * 10^{-78}$

Property:

$1/$
$(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,$
$000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi})$ is a transcendental number

Series representations:

$$\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,\left(10^{21}\right)^{5}\,10} = 1 \Big/ \left(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots \right.$$
$$\left. 000\,000\,000\,000\,000\,000\,000\,\sqrt{2}\,\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)$$

$$\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,\left(10^{21}\right)^{5}\,10} = 1 \Big/ \left(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots \right.$$
$$\left. 000\,000\,000\,000\,000\,000\,000\,\sqrt{2}\,\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}\frac{(-1)^{k}\,(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)$$

$$\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,\left(10^{21}\right)^{5}\,10} = \left(\sqrt{\pi}\right) \Big/ \left(156\,250\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots \right.$$
$$000\,000\,000\,000\,000\,000\,000\,\sqrt{2}$$
$$\left. \sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}\,(-1+\pi)^{-s}\,\Gamma\!\left(-\frac{1}{2}-s\right)\Gamma(s)\right)$$

From which:

ln(((1/(((4/sqrt(Pi) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^-1))))))

Input:

$$\log\left(\frac{1}{\frac{\frac{4}{\sqrt{\pi}}\times 2^{5/2}\times 10^{27}}{(10^{21})^5\times 10}}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$\log(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi})$$

Decimal approximation:

179.357424976934555232115494049179507199970914403509572248846655 66...

179.35742497…

Alternate forms:

$$\log(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000) + \frac{1}{2}(\log(2)+\log(\pi))$$

$$\frac{149\log(2)}{2} + 79\log(5) + \frac{\log(\pi)}{2}$$

$$\frac{1}{2}(149\log(2) + 158\log(5) + \log(\pi))$$

Alternative representations:

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = \log_e\left(\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)$$

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = \log(a)\log_a\left(\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)$$

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = -\text{Li}_1\left(1-\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)$$

Series representations:

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = \log\big(-1 + 312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\big) - \sum_{k=1}^{\infty}\frac{1}{k}\big(1/\big(1 - 312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\big)\big)^k$$

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = 2\,i\,\pi\left\lfloor\frac{1}{2\pi}\arg\big(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi} - x\big)\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\big(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi} - x\big)^k x^{-k} \quad \text{for } x < 0$$

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = 2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor + \log(z_0) - \sum_{k=1}^{\infty}\frac{1}{k}(-1)^k \left(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi} - z_0\right)^k z_0^{-k}$$

Integral representations:

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = \int_1^{312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}} \frac{1}{t}\,dt$$

$$\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right) = -\frac{i}{2\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1}{\Gamma(1-s)}\left(-1+312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)\,ds \quad \text{for } -1<\gamma<0$$

And:

1+(((1/(((ln(((1/(((4/sqrt(Pi) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^-1))))))^1/11))))))

Input:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{\frac{4}{\sqrt{\pi}}\times 2^{5/2}\times 10^{27}}{(10^{21})^5\times 10}}\right)}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$1+1/(\log(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\sqrt{2\pi})\,\hat{}\,(1/11))$$

Decimal approximation:

1.6239020631856049496873323791750812759686473202582061389590306840...

1.6239020631…. result that is a good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$1+1/((\log(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000)+\frac{1}{2}(\log(2)+\log(\pi)))\,\hat{}\,(1/11))$$

$$(1+\log(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\sqrt{2\pi})\,\hat{}\,(1/11))/(\log(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\sqrt{2\pi})\,\hat{}\,(1/11))$$

$$\frac{\sqrt[11]{2}+\sqrt[11]{149\log(2)+158\log(5)+\log(\pi)}}{\sqrt[11]{149\log(2)+158\log(5)+\log(\pi)}}$$

Alternative representations:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} = 1+\frac{1}{\sqrt[11]{\log_e\left(\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} = 1+\frac{1}{\sqrt[11]{\log(a)\log_a\left(\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} = 1+\frac{1}{\sqrt[11]{-\text{Li}_1\left(1-\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}$$

Series representations:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} = 1+1\Bigg/\left(\left(\log\big(-1+\right.\right.$$

$$312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

$$\left.\left.\sqrt{2\pi}\big)-\sum_{k=1}^{\infty}\frac{1}{k}\big(1/\big(1-312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\big)\big)^k\right)\text{^}(1/11)\right)$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} = 1+1\Big/\left(\left(2\,i\,\pi\left\lfloor\frac{1}{2\,\pi}\arg(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}-x)\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\,(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}-x)^k\,x^{-k}\right)\text{^}(1/11)\right)\quad \text{for } x<0$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} =$$

$$1+1\Big/\left(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\,(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}-z_0)^k\,z_0^{-k}\right)\text{^}(1/11)\right)$$

Integral representations:

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}} = 1+1\Big/\left(\left(\int_1^{312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}}\frac{1}{t}\,dt\right)\text{^}(1/11)\right)$$

$$1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}}}{(10^{21})^5\ 10}}\right)}} = 1+\left(\sqrt[11]{2\pi}\right)\Big/\left(\left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1}{\Gamma(1-s)}\left(-1+312500000000000000000000000000000000000000000000000000000000000000000000000000\sqrt{2\pi}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)\,ds\right)^{\wedge}(1/11)\right) \quad \text{for } -1<\gamma<0$$

((1+(((1/(((ln(((1/(((4/sqrt(Pi) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^-1))))))^1/11))))))-1))^1/32

Input:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{\frac{4}{\sqrt{\pi}}\times 2^{5/2}\times 10^{27}}{(10^{21})^5\times 10}}\right)}}-1}$$

log(x) is the natural logarithm

Exact result:

$$1/\left(\log\left(312500000000000000000000000000000000000000000000000000000000000000000000000000\sqrt{2\pi}\right)^{\wedge}(1/352)\right)$$

Decimal approximation:

0.9853655809165973538164910685121449910741057501011077058925074829 …

0.9853655809….. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the Omega mesons (ω/ω_3 | $5+3$ | $m_{u/d} = 255 - 390$ | $0.988 - 1.18$) Regge slope value (0.988) connected to the dilaton scalar field **0.989117352243 = ϕ**

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Alternate forms:

$$1/((\log(312500000000000000000000000000000000000000000000000000000000000000000000000000000000) + \frac{1}{2}(\log(2)+\log(\pi)))\,\hat{}\,(1/352))$$

$$\sqrt[352]{\frac{2}{149\log(2)+158\log(5)+\log(\pi)}}$$

$$\frac{1}{\sqrt[352]{74\log(2)+79\log(5)+\frac{1}{2}(\log(2)+\log(\pi))}}$$

All 32nd roots of 1/log(31250000000000000000000000000000000000000000000000000000000000 0000000000000000 sqrt(2 π))^(1/11):

$e^{0}/\big(\log($
$312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots$
$000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\,)\,\hat{}\,(1/352)\big) \approx 0.985365581$ (real, principal root)

$e^{(i\pi)/16}/\big(\log($
$312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots$
$000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\,)\,\hat{}\,(1/352)\big)$
$\approx 0.966432 + 0.19224\,i$

$e^{(i\pi)/8}/\big(\log($
$312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots$
$000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\,)\,\hat{}\,(1/352)\big)$
$\approx 0.91036 + 0.37708\,i$

$e^{(3i\pi)/16}/\big(\log($
$312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots$
$000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\,)\,\hat{}\,(1/352)\big)$
$\approx 0.81930 + 0.54744\,i$

$e^{(i\pi)/4}/\big(\log($
$312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \ddots$
$000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\,)\,\hat{}\,(1/352)\big)$
$\approx 0.69676 + 0.69676\,i$

Alternative representations:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = \sqrt[32]{\frac{1}{\sqrt[11]{\log_e\left(\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}}$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = \sqrt[32]{\frac{1}{\sqrt[11]{\log(a)\log_a\left(\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}}$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = \sqrt[32]{\frac{1}{\sqrt[11]{-\mathrm{Li}_1\left(1-\frac{1}{\frac{4\times 2^{5/2}\times 10^{27}}{10\,(10^{21})^5\,\sqrt{\pi}}}\right)}}}$$

Series representations:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = 1\Big/\Bigg(\Bigg(\log\big(-1+ 312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\big) - \sum_{k=1}^{\infty}\frac{1}{k}\big(1/\big(1- 312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\big)\big)^k\Bigg)\,\hat{}\,(1/352)\Bigg)$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = 1\Big/\left(\left(2\,i\,\pi\left\lfloor\frac{1}{2\,\pi}\arg\left(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}-x\right)\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\left(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}-x\right)^k x^{-k}\right)\wedge(1/352)\right) \quad \text{for } x<0$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = 1\Big/\left(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\left(312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}-z_0\right)^k z_0^{-k}\right)\wedge(1/352)\right)$$

Integral representations:

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}-1} = 1\Big/\left(\left(\int_1^{312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\,\pi}}\frac{1}{t}\,dt\right)\wedge(1/352)\right)$$

$$\sqrt[32]{1+\frac{1}{\sqrt[11]{\log\left(\frac{1}{\frac{2^{5/2}\times 4\times 10^{27}}{\sqrt{\pi}\,(10^{21})^5\,10}}\right)}}}-1 = \left(\sqrt[352]{2\pi}\right)\Big/\left(\left(-i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1}{\Gamma(1-s)}\left(-1+312\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{2\pi}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)\,ds\right)\hat{}\,(1/352)\right)$$

for $-1 < \gamma < 0$

$\Gamma(x)$ is the gamma function

For p = 10, $\tau = 10^{21}$, we obtain:

$$\frac{4}{\pi^{1/2}}\,10^{-1}\left(\frac{3}{4}\right)^{\frac{1}{p-1}}\,p^{(3p-1)/2(p-1)}\,10^{27/(p-1)}\,\tau^{-(2p-1)/2(p-1)}\,10^{7/3(p-1)} < 10^{-4}; \quad (4.11a)$$

4/sqrt(Pi)*10^-1*(3/4)^(1/9) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^((7/3)*9)

Input:

$$\frac{1}{10}\times\frac{4}{\sqrt{\pi}}\sqrt[9]{\frac{3}{4}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{7/3\times 9}$$

Exact result:

$$\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}$$

Decimal approximation:

608.2014029152413242000951351103579172376909783093020267055489786 1…

608.201402915…

Property:

$\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}$ is a transcendental number

Series representations:

$$\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}=\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}}$$

$$\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}=\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}$$

$$\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}=\frac{800\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}\sqrt{\pi}}{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}$$

From which:

ln(((4/sqrt(Pi)*10^-1*(3/4)^(1/9) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^((7/3)*9))))

Input:

$$\log\left(\frac{1}{10}\times\frac{4}{\sqrt{\pi}}\sqrt[9]{\frac{3}{4}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{7/3\times 9}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)$$

Decimal approximation:

6.4105060819082154340912609002467332398518776443667707687319427205
…

6.4105060819…

Alternate forms:

$$\frac{1}{18}\left(2\left(38\log(2)+\log(3)+22\log(5)\right)-9\log(\pi)\right)$$

$$\frac{2\log(2)}{9}+\frac{\log(3)}{9}+\frac{4\log(5)}{9}+\log(400)-\frac{\log(\pi)}{2}$$

$$\frac{1}{18}\left(76\log(2)+44\log(5)+\log(9)-9\log(\pi)\right)$$

Alternative representations:

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = \log_e\left(\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)$$

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = \log(a)\log_a\left(\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)$$

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = -\text{Li}_1\left(1-\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)$$

Series representations:

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$

$$\log\left(-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}\right)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}}\right)^k}{k}$$

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$

$$2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}-x\right)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$

$$2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}-z_0\right)^k z_0^{-k}}{k}$$

Integral representations:

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = \int_1^{\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}}\frac{1}{t}\,dt$$

$$\log\left(\frac{\left(4\sqrt[9]{\frac{3}{4}}\right)10^{29/18}\left(10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) =$$

$$-\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

1/4*ln(((4/sqrt(Pi)*10^-1*(3/4)^(1/9) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^((7/3)*9))))

Input:

$$\frac{1}{4}\log\left(\frac{1}{10}\times\frac{4}{\sqrt{\pi}}\sqrt[9]{\frac{3}{4}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{7/3\times 9}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}\right)$$

Decimal approximation:

1.6026265204770538585228152250616833099629694110916926921829856801

...

1.60262652…. result that is a good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$\frac{1}{72}\left(76\log(2)+44\log(5)+\log\left(\frac{9}{\pi^9}\right)\right)$$

$$\frac{1}{72}(2(38\log(2)+\log(3)+22\log(5))-9\log(\pi))$$

$$\frac{19\log(2)}{18}+\frac{\log(3)}{36}+\frac{11\log(5)}{18}-\frac{\log(\pi)}{8}$$

Alternative representations:

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$
$$\frac{1}{4}\log_e\left(\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)$$

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$
$$\frac{1}{4}\log(a)\log_a\left(\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)$$

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = -\frac{1}{4}\operatorname{Li}_1\left(1-\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)$$

Series representations:

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = \frac{1}{4}\log\left(-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}\right)-\frac{1}{4}\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}}\right)^k}{k}$$

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right) = \frac{1}{2}i\pi\left\lfloor\frac{\arg\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}-x\right)}{2\pi}\right\rfloor+\frac{\log(x)}{4}-\frac{1}{4}\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$

$$\frac{1}{2}i\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\frac{\log(z_0)}{4}-\frac{1}{4}\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}-z_0\right)^k z_0^{-k}}{k}$$

Integral representations:

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=\frac{1}{4}\int_1^{\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}}\frac{1}{t}\,dt$$

$$\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)=$$

$$-\frac{i}{8\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

And also:

((1/4*ln(((4/sqrt(Pi)*10^-1*(3/4)^(1/9) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^((7/3)*9))))-1))^1/32

Input:

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{1}{10}\times\frac{4}{\sqrt{\pi}}\sqrt[9]{\frac{3}{4}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{7/3\times 9}\right)-1}$$

log(x) is the natural logarithm

Exact result:

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}\right)-1}$$

Decimal approximation:

0.9842977843411468839801941646948299147819701856392248935135806601...

0.984297784…. 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 Omega mesons (ω/ω_3 | $5+3$ | $m_{u/d}=255-390$ | $0.988-1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243=\phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Alternate forms:

$$\sqrt[32]{-1+\frac{1}{36}(9\log(400)+\log(7500))-\frac{\log(\pi)}{8}}$$

$$\frac{\sqrt[32]{\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)-4}}{\sqrt[16]{2}}$$

$$\sqrt[32]{\frac{1}{4}\left(\frac{2\log(2)}{9}+\frac{\log(3)}{9}+\frac{4\log(5)}{9}+\log(400)-\frac{\log(\pi)}{2}\right)-1}$$

All 32nd roots of 1/4 log((400 2^(2/9) 3^(1/9) 5^(4/9))/sqrt(π)) - 1:

$$e^0\sqrt[32]{\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)-1}\approx 0.98430$$ (real, principal root)

$$e^{(i\pi)/16}\sqrt[32]{\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)-1}\approx 0.96538+0.19203\,i$$

$$e^{(i\pi)/8}\sqrt[32]{\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)-1}\approx 0.90937+0.37667\,i$$

$$e^{(3i\pi)/16}\sqrt[32]{\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)-1}\approx 0.81841+0.5468\,i$$

$$e^{(i\pi)/4}\sqrt[32]{\frac{1}{4}\log\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\ 5^{4/9}}{\sqrt{\pi}}\right)-1}\approx 0.69600+0.69600\,i$$

Alternative representations:

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} = \sqrt[32]{-1+\frac{1}{4}\log_e\left(\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)}$$

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} = \sqrt[32]{-1+\frac{1}{4}\log(a)\log_a\left(\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)}$$

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} = \sqrt[32]{-1-\frac{1}{4}\operatorname{Li}_1\left(1-\frac{4\times 10^{21}\times 10^{27/9}\times 10^{29/18}\sqrt[9]{\frac{3}{4}}\left(10^{21}\right)^{-19/18}}{10\sqrt{\pi}}\right)}$$

Series representations:

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\,10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} = \sqrt[32]{-1+\frac{1}{4}\left(\log\left(-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}\right)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}}\right)^k}{k}\right)}$$

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\,10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} = \left(-1+\frac{1}{4}\left(2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}-x\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\;5^{4/9}}{\sqrt{\pi}}-x\right)^k x^{-k}}{k}\right)\right)\hat{}\,(1/32) \quad \text{for } x<0$$

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} =$$

$$\left(-1+\frac{1}{4}\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}-z_0\right)^k z_0^{-k}}{k}\right)\right)\text{^}(1/32)$$

Integral representations:

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} =$$

$$\sqrt[32]{-1+\frac{1}{4}\int_1^{\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}}\frac{1}{t}\,dt}$$

$$\sqrt[32]{\frac{1}{4}\log\left(\frac{4\sqrt[9]{\frac{3}{4}}\left(10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}10^{(7\times 9)/3}\right)}{10\sqrt{\pi}}\right)-1} =$$

$$\sqrt[32]{-1-\frac{i}{8\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\left(-1+\frac{400\times 2^{2/9}\sqrt[9]{3}\,5^{4/9}}{\sqrt{\pi}}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds} \quad \text{for } -1<\gamma<0$$

From

$$\frac{4}{\pi^{1/2}}\,p^{(3p-1)/2(p-1)}\,10^{27/(p-1)}\,\tau^{-(2p-1)/2(p-1)}\,10^{-1/(p-1)} \gtrsim 10^{-5}$$

we obtain:

4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^-(1/9)

Input:

$$\frac{4}{\sqrt{\pi}} \times 10^{29/18} \times 10^{27/9} \left(10^{21}\right)^{-19/18} \times 10^{-1/9}$$

Exact result:

$$\frac{1}{25\,000\,000\,000\,000\,000 \times 10^{2/3} \sqrt{\pi}}$$

Decimal approximation:

$4.8620384421997115198714598881311782036569583837502394977514\ldots \times 10^{-18}$

$4.86203844\ldots{*}10^{-18}$

Property:

$\frac{1}{25\,000\,000\,000\,000\,000 \times 10^{2/3} \sqrt{\pi}}$ is a transcendental number

Series representations:

$$\frac{\left(10^{29/18} \times 4 \times 10^{27/9}\right)\left(10^{21}\right)^{-19/18} 10^{-1/9}}{\sqrt{\pi}} = \frac{1}{25\,000\,000\,000\,000\,000 \times 10^{2/3} \sqrt{-1+\pi} \sum_{k=0}^{\infty} (-1+\pi)^{-k} \binom{\frac{1}{2}}{k}}$$

$$\frac{\left(10^{29/18} \times 4 \times 10^{27/9}\right)\left(10^{21}\right)^{-19/18} 10^{-1/9}}{\sqrt{\pi}} = \frac{1}{25\,000\,000\,000\,000\,000 \times 10^{2/3} \sqrt{-1+\pi} \sum_{k=0}^{\infty} \frac{(-1)^k (-1+\pi)^{-k} \left(-\frac{1}{2}\right)_k}{k!}}$$

$$\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}} = \frac{\sqrt{\pi}}{12\,500\,000\,000\,000\,000\times 10^{2/3}\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}$$

from which:

-ln[4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^-(1/9)]

Input:

$$-\log\left(\frac{4}{\sqrt{\pi}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{-1/9}\right)$$

log(x) is the natural logarithm

Exact result:

$$-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}\right)$$

Decimal approximation:

39.865073891366283219221765132183943887292106770178801187437577767...

39.86507389…

Alternate forms:

$$\frac{2\log(10)}{3}+\log(25\,000\,000\,000\,000\,000)+\frac{\log(\pi)}{2}$$

$$\frac{1}{6}\left(94\log(2)+106\log(5)+3\log(\pi)\right)$$

$$\frac{47\log(2)}{3}+\frac{53\log(5)}{3}+\frac{\log(\pi)}{2}$$

Alternative representations:

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)=$$
$$-\log_e\left(\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)$$

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)=$$
$$-\log(a)\log_a\left(\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)$$

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)=$$
$$\mathrm{Li}_1\left(1-\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)$$

Series representations:

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)=$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}\right)^k}{k}$$

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)= -2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}-x\right)}{2\pi}\right\rfloor-\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)=-2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor-\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}-z_0\right)^k z_0^{-k}}{k}$$

Integral representation:

$$-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)=-\int_1^{\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}}\frac{1}{t}\,dt$$

1+((1/(((-ln[4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^-(1/9)])))^1/8))

Input:

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{4}{\sqrt{\pi}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{-1/9}\right)}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}\right)}}$$

Decimal approximation:

1.6308497398828164980018760911372243601785217871915553101991885409

...

1.630849739…. result very near to the mean between $\zeta(2)=\frac{\pi^2}{6}=1.644934$ ... and the value of golden ratio 1.61803398…, i.e. 1.63148399

Alternate forms:

$$1+\frac{1}{\sqrt[8]{\frac{2\log(10)}{3}+\log(25\,000\,000\,000\,000\,000)+\frac{\log(\pi)}{2}}}$$

$$1+\sqrt[8]{\frac{6}{94\log(2)+106\log(5)+3\log(\pi)}}$$

$$1+\sqrt[8]{\frac{6}{2(47\log(2)+53\log(5))+3\log(\pi)}}$$

Alternative representations:

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}=$$
$$1+\frac{1}{\sqrt[8]{-\log_e\left(\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)}}$$

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}} = 1+\frac{1}{\sqrt[8]{\mathrm{Li}_1\left(1-\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)}}$$

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}} = 1+\frac{1}{\sqrt[8]{-\log(a)\log_a\left(\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)}}$$

Series representations:

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}} = 1+\frac{1}{\sqrt[8]{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}\right)^k}{k}}}$$

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}} = 1+1\Big/\left(\left(-2 i\pi\left\lfloor\frac{\arg\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}-x\right)}{2\pi}\right\rfloor-\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}-x\right)^k x^{-k}}{k}\right)\hat{}\,(1/8)\right) \quad \text{for } x<0$$

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}=$$

$$1+1\Bigg/\left(\left(-2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}-z_0\right)^k z_0^{-k}}{k}\right)^{\wedge}(1/8)\right)$$

Integral representation:

$$1+\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}=$$

$$1+\frac{1}{\sqrt[8]{-\int_1^{\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}}\frac{1}{t}\,dt}}$$

And also:

((((1/(((-ln[4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^-(1/9)])))^1/8))))^1/32

Input:

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{4}{\sqrt{\pi}}\times 10^{29/18}\times 10^{27/9}\left(10^{21}\right)^{-19/18}\times 10^{-1/9}\right)}}}$$

log(x) is the natural logarithm

Exact result:

$$\frac{1}{\sqrt[256]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}\right)}}$$

Decimal approximation:

0.9857066471829948866540286976331470955839010631315882800434396271...

0.9857066471… 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 Omega mesons (ω/ω_3 | $5+3$ | $m_{u/d}=255-390$ | $0.988-1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243}=\boldsymbol{\phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Alternate forms:

$$\frac{1}{\sqrt[256]{\frac{2\log(10)}{3}+\log(25\,000\,000\,000\,000\,000)+\frac{\log(\pi)}{2}}}$$

$$\sqrt[256]{\frac{6}{94\log(2)+106\log(5)+3\log(\pi)}}$$

$$\sqrt[256]{\frac{6}{2\,(47\log(2)+53\log(5))+3\log(\pi)}}$$

All 32nd roots of 1/(-log(1/(25000000000000000 10^(2/3) sqrt(π))))^(1/8):

$$\frac{e^{0}}{\sqrt[256]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}\right)}}\approx 0.9857 \quad \text{(real, principal root)}$$

$$\frac{e^{(i\pi)/16}}{\sqrt[256]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}\right)}}\approx 0.9668+0.19230\,i$$

$$\frac{e^{(i\pi)/8}}{\sqrt[256]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}\right)}}\approx 0.9107+0.3772\,i$$

$$\frac{e^{(3i\pi)/16}}{\sqrt[256]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}\right)}}\approx 0.8196+0.5476\,i$$

$$\frac{e^{(i\pi)/4}}{\sqrt[256]{-\log\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}\right)}}\approx 0.6970+0.6970\,i$$

Alternative representations:

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}} = \sqrt[32]{\frac{1}{\sqrt[8]{-\log_e\left(\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)}}}$$

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}} = \sqrt[32]{\frac{1}{\sqrt[8]{\mathrm{Li}_1\left(1-\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)}}}$$

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}} = \sqrt[32]{\frac{1}{\sqrt[8]{-\log(a)\log_a\left(\frac{4\times 10^{-1/9}\times 10^{27/9}\times 10^{29/18}\left(10^{21}\right)^{-19/18}}{\sqrt{\pi}}\right)}}}$$

Series representations:

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{\left(10^{29/18}\times 4\times 10^{27/9}\right)\left(10^{21}\right)^{-19/18}\,10^{-1/9}}{\sqrt{\pi}}\right)}}} = \frac{1}{\sqrt[256]{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{25\,000\,000\,000\,000\,000\,000\times 10^{2/3}\sqrt{\pi}}\right)^k}{k}}}$$

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{(10^{29/18}\times 4\times 10^{27/9})(10^{21})^{-19/18}\ 10^{-1/9}}{\sqrt{\pi}}\right)}}} =$$

$$1\Bigg/\left(\left(-2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}-x\right)}{2\,\pi}\right\rfloor-\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}-x\right)^k x^{-k}}{k}\right)\wedge(1/256)\right) \quad \text{for } x<0$$

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{(10^{29/18}\times 4\times 10^{27/9})(10^{21})^{-19/18}\ 10^{-1/9}}{\sqrt{\pi}}\right)}}} =$$

$$1\Bigg/\left(\left(-2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}-z_0\right)^k z_0^{-k}}{k}\right)\wedge(1/256)\right)$$

Integral representation:

$$\sqrt[32]{\frac{1}{\sqrt[8]{-\log\left(\frac{(10^{29/18}\times 4\times 10^{27/9})(10^{21})^{-19/18}\ 10^{-1/9}}{\sqrt{\pi}}\right)}}} = \frac{1}{\sqrt[256]{-\int_1^{\frac{1}{25\,000\,000\,000\,000\,000\times 10^{2/3}\,\sqrt{\pi}}}\frac{1}{t}\,dt}}$$

From the four previous result, we obtain:

(39.86507389 * 6.4105060819 + 179.35742497 / 174.272408499)

Input interpretation:

$$39.86507389 \times 6.4105060819 + \frac{179.35742497}{174.272408499}$$

Result:

256.58447717887895173364237967505132850490817270425747385424042885
...

256.58447717…≈ 256 = 64*4 = 8^2 * 2^2

And:

2*((16(39.86507389 * 6.4105060819 + 179.35742497 / 174.272408499)-7-2-1/3))

Input interpretation:

$$2\left(16\left(39.86507389 \times 6.4105060819 + \frac{179.35742497}{174.272408499}\right) - 7 - 2 - \frac{1}{3}\right)$$

Result:

8192.0366030574597888098894829349758454903948598695724966690270565
...

8192.036603057…≈ 8192

8192

The total amplitude vanishes for gauge group SO(8192), while the vacuum energy is negative and independent of the gauge group.

The vacuum energy and dilaton tadpole to lowest non-trivial order for the open bosonic string. While the vacuum energy is non-zero and independent of the gauge group, the dilaton tadpole is zero for a unique choice of gauge group, SO(2^{13}) i.e. SO(8192). (From: "Dilaton Tadpole for the Open Bosonic String " Michael R. Douglas and Benjamin Grinstein - September 2,1986)

[4(((39.86507389 * 6.4105060819 + 179.35742497 / 174.272408499)))]^1/14

Input interpretation:

$$\sqrt[14]{4\left(39.86507389\times 6.4105060819+\frac{179.35742497}{174.272408499}\right)}$$

Result:

1.6409379887…

1.6409379887….≈ ζ(2) = $\frac{\pi^2}{6}$ = 1.644934 ...

Now, we have that:

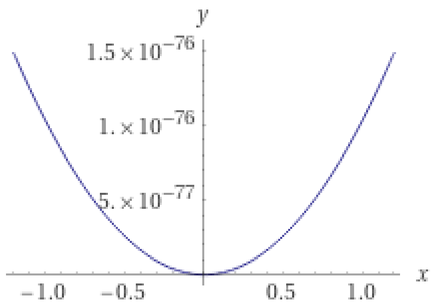
integral((4/sqrt(Pi)*10^-1*(3/4) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^(7/3)))x

Indefinite integral:

$$\int \frac{(4\times 3\times 2^{5/2}\times 10^{27}\times 10^{7/3})\,x}{\sqrt{\pi}\ 10\times 4\,(10^{21})^5}\,dx \approx \text{constant} + 1.03139\times 10^{-76}\,x^2$$

$1.03139*10^{-76}$

Plot of the integral:



(x from −1.2 to 1.2)

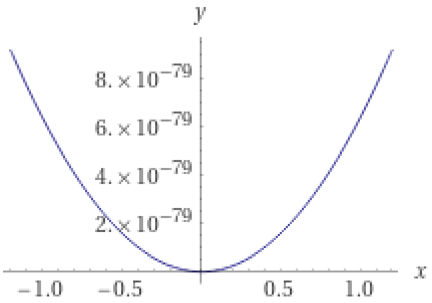
integral((4/sqrt(Pi) * 2^(5/2) * 10^(27) * (10^21)^-5 * 10^-1))x

Indefinite integral:

$$\int \frac{(4 \times 2^{5/2} \times 10^{27})\, x}{\sqrt{\pi}\, (10^{21})^5\, 10}\, dx \approx \text{constant} + 6.38308 \times 10^{-79}\, x^2$$

6.38308*10^{-79}

Plot of the integral:



(x from −1.2 to 1.2)

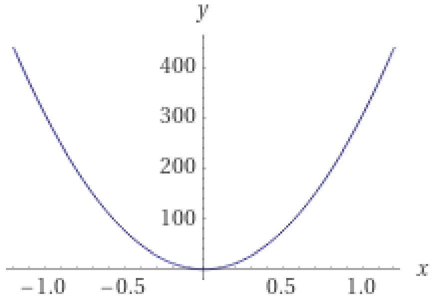
integral(((4/sqrt(Pi)*10^-1*(3/4)^(1/9) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^((7/3)*9))))x

Indefinite integral:

$$\int \frac{\left(4 \sqrt[9]{\frac{3}{4}}\ 10^{29/18} \times 10^{27/9}\, (10^{21})^{-19/18}\, 10^{(7 \times 9)/3}\right) x}{\sqrt{\pi}\ 10}\, dx = \frac{200 \times 2^{2/9} \sqrt[9]{3}\ 5^{4/9}\, x^2}{\sqrt{\pi}} + \text{constant}$$

$$\int \frac{\left(4 \sqrt[9]{\frac{3}{4}}\ 10^{29/18} \times 10^{27/9}\, (10^{21})^{-19/18}\, 10^{(7 \times 9)/3}\right) x}{\sqrt{\pi}\ 10}\, dx \approx \text{constant} + 304.101\, x^2$$

Plot of the integral:



(x from -1.2 to 1.2)

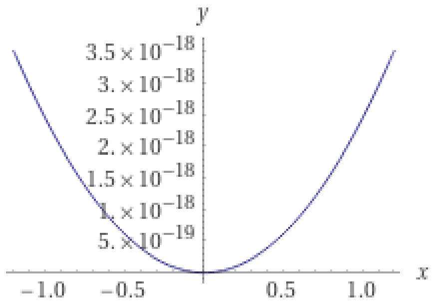
integral(((4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (10^21)^-(19/18) * 10^-(1/9))))x

Indefinite integral:

$$\int \frac{\left(4 \times 10^{29/18} \times 10^{27/9} \left(10^{21}\right)^{-19/18} 10^{-1/9}\right) x}{\sqrt{\pi}} \, dx \approx \text{constant} + 2.43102 \times 10^{-18} x^2$$

$2.43102*10^{-18}$

Plot of the integral:



(x from -1.2 to 1.2)

(2.43102*10^-18 / 6.38308*10^-79) * (1/ 1.03139*10^-76) * (1/ 304.101)

[(2.43102*10^-18 / 6.38308*10^-79) * (1.03139*10^-76) * (304.101)]^1/64+1

Input interpretation:

$$\sqrt[64]{\frac{2.43102\times10^{-18}}{6.38308\times10^{-79}}\times1.03139\times10^{-76}\times304.101}+1$$

Result:

1.6281758477274618941360557942124576970424627360864678244460955458 ...

1.6281758477…. result very near to the mean between $\zeta(2)=\frac{\pi^2}{6}=1.644934$ ... and the value of golden ratio 1.61803398…, i.e. 1.63148399

From the sum of the four results and dividing by 4, we obtain:

1/4[(2.43102*10^-18) + (6.38308*10^-79) + (1.03139*10^-76) + (304.101)]

Input interpretation:

$$\frac{1}{4}\left(2.43102\times10^{-18}+6.38308\times10^{-79}+1.03139\times10^{-76}+304.101\right)$$

Result:

76.025250000000000000607755000000000000000000000000000000000000000 ...

76.025250000….. ≈ 76 (Lucas number)

From which:

123*1/(((1/4[(2.43102*10^-18) + (6.38308*10^-79) + (1.03139*10^-76) + (304.101)])))

Input interpretation:

$$123\times\frac{1}{\frac{1}{4}\left(2.43102\times10^{-18}+6.38308\times10^{-79}+1.03139\times10^{-76}+304.101\right)}$$

Result:

1.6178835321159746268380139913244462312279941572925128319964752554
...

1.61788353211…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Now, we have:

ii) Evolution of Z outside the horizon ($kS/H \ll 1$).

By neglecting the last term of (3.1) we get the approximated solution

$$Z \simeq Z^* \frac{t^*}{t_1} \left\{ \cos \int^{t_1} dt' \frac{k}{S} - \frac{1}{p+1} \left[\cos \int^{t_1} dt' \frac{k}{S} + p \sin \int^{t_1} dt' \frac{k}{S} \right] \left[1 - \left(\frac{t_1}{t} \right)^{p+1} \right] \right., \qquad (3.8)$$

which matches at t_1 to the extrapolation of (3.6). For times $t \gg t_1$ one easily gets, after averaging over phases,

$$Z(t)/Z(t_1) \simeq \sqrt{2} \frac{(p^2 + p + 1)^{1/2}}{(p+1)} \qquad (3.9)$$

which is of order unity for any p greater than one: as in SI the variable Z outside the horizon rapidly tends to a constant value. This is a good approximation as far as reheating effects are still negligible.

From:

$$Z \simeq Z^* \frac{t^*}{t_1} \left\{ \cos \int^{t_1} dt' \frac{k}{S} - \frac{1}{p+1} \left[\cos \int^{t_1} dt' \frac{k}{S} + p \sin \int^{t_1} dt' \frac{k}{S} \right] \left[1 - \left(\frac{t_1}{t} \right)^{p+1} \right] \right.,$$

$$Z(t)/Z(t_1) \simeq \sqrt{2} \frac{(p^2 + p + 1)^{1/2}}{(p+1)}$$

we have that:

((Sqrt(2) (2^2+2+1)^0.5)) / (2+1)

Input:

$$\frac{\sqrt{2}\sqrt{2^2+2+1}}{2+1}$$

Exact result:

$$\frac{\sqrt{14}}{3}$$

Decimal approximation:

1.2472191289246471285279162441055164339186732692595756487679151557...

1.2472191289…..

1+1/2(((((Sqrt(2) (2^2+2+1)^0.5)) / (2+1))))

Input:

$$1+\frac{1}{2}\times\frac{\sqrt{2}\sqrt{2^2+2+1}}{2+1}$$

Exact result:

$$1+\frac{\sqrt{\frac{7}{2}}}{3}$$

Decimal approximation:

1.6236095644623235642639581220527582169593366346297878243839575778...

1.6236095644…. result that is a good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$\frac{1}{6}\left(6+\sqrt{14}\right)$$

$$\frac{1}{3}\left(3+\sqrt{\frac{7}{2}}\right)$$

$$\frac{\sqrt{14}}{6} + 1$$

Minimal polynomial:

$$18 x^2 - 36 x + 11$$

We have that:

$$(\delta\rho/\rho)_{t_H} \simeq \frac{4b'}{\pi^{1/2}} p^{(3p-1)/2(p-1)} 10^{27/(p-1)} \tau^{-(2p-1)/2(p-1)} (M/M_{eq})^{1/3(p-1)}, \quad (4.10)$$

$$M < M_{eq} \simeq 10^{15} M_{\odot}$$

$b' = 1$ for $M < M_{eq}$ $\quad \tau \lesssim 2.5 \times 10^{18}$

p = 2

4/sqrt(Pi) * 2^(5/2) * 10^27 * (2.5e+18)^(-3/2) * (1/5*1.989*10^30*10^15)^(1/3)

Input interpretation:

$$\frac{4}{\sqrt{\pi}} \times 2^{5/2} \times 10^{27} \left(2.5 \times 10^{18}\right)^{-3/2} \sqrt[3]{\frac{1}{5} \times 1.989 \times 10^{30} \times 10^{15}}$$

Result:

$2.375226103106068969\ldots \times 10^{15}$

$2.3752261031\ldots.*10^{15}$

(55+3)*1/(((ln((4/sqrt(Pi) * 2^(5/2) * 10^27 * (2.5e+18)^(-3/2) * (1/5*1.989*10^30*10^15)^(1/3))))))

Input interpretation:

$$(55+3)\times\frac{1}{\log\left(\frac{4}{\sqrt{\pi}}\times 2^{5/2}\times 10^{27}\left(2.5\times 10^{18}\right)^{-3/2}\sqrt[3]{\frac{1}{5}\times 1.989\times 10^{30}\times 10^{15}}\right)}$$

log(x) is the natural logarithm

Result:

1.6382390284012863641...

1.6382390284…..≈ $\zeta(2) = \frac{\pi^2}{6} = 1.644934$ ...

4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (2.5e+18)^(-19/18) * (1/5*1.989*10^30*10^15)^(1/27)

Input interpretation:

$$\frac{4}{\sqrt{\pi}}\times 10^{29/18}\times 10^{27/9}\left(2.5\times 10^{18}\right)^{-19/18}\sqrt[27]{\frac{1}{5}\times 1.989\times 10^{30}\times 10^{15}}$$

Result:

$1.571765730045711244\ldots\times 10^{-13}$

$1.57176573\ldots*10^{-13}$

48 / ((-ln((4/sqrt(Pi) * 10^(29/18) * 10^(27/9) * (2.5e+18)^(-19/18) * (1/5*1.989*10^30*10^15)^(1/27)))))

Input interpretation:

$$-\frac{48}{\log\left(\frac{4}{\sqrt{\pi}}\times 10^{29/18}\times 10^{27/9}\left(2.5\times 10^{18}\right)^{-19/18}\sqrt[27]{\frac{1}{5}\times 1.989\times 10^{30}\times 10^{15}}\right)}$$

log(x) is the natural logarithm

Result:

1.6281448415353275085...

1.6281448415….. result very near to the mean between $\zeta(2) = \frac{\pi^2}{6} = 1.644934$ ... and the value of golden ratio 1.61803398…, i.e. 1.63148399

From:

Modular equations and approximations to π - *Srinivasa Ramanujan*
Quarterly Journal of Mathematics, XLV, 1914, 350 – 372

We have that:

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \cdots, \\ 64g_{22}^{-24} &= 4096e^{-\pi\sqrt{22}} + \cdots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \cdots = 64\{(1+\sqrt{2})^{12} + (1-\sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982\ldots.$$

Again

$$G_{37} = (6+\sqrt{37})^{\frac{1}{4}},$$

$$\begin{aligned} 64G_{37}^{24} &= e^{\pi\sqrt{37}} + 24 + 276e^{-\pi\sqrt{37}} + \cdots, \\ 64G_{37}^{-24} &= 4096e^{-\pi\sqrt{37}} - \cdots, \end{aligned}$$

so that

$$64(G_{37}^{24} + G_{37}^{-24}) = e^{\pi\sqrt{37}} + 24 + 4372e^{-\pi\sqrt{37}} - \cdots = 64\{(6+\sqrt{37})^{6} + (6-\sqrt{37})^{6}\}.$$

Hence

$$e^{\pi\sqrt{37}} = 199148647.999978\ldots.$$

Similarly, from

$$g_{58} = \sqrt{\left(\frac{5+\sqrt{29}}{2}\right)},$$

we obtain

$$64(g_{58}^{24} + g_{58}^{-24}) = e^{\pi\sqrt{58}} - 24 + 4372e^{-\pi\sqrt{58}} + \cdots = 64\left\{\left(\frac{5+\sqrt{29}}{2}\right)^{12} + \left(\frac{5-\sqrt{29}}{2}\right)^{12}\right\}.$$

Hence

$$e^{\pi\sqrt{58}} = 24591257751.99999982\ldots.$$

From:

An Update on Brane Supersymmetry Breaking
J. Mourad and A. Sagnotti - arXiv:1711.11494v1 [hep-th] 30 Nov 2017

From the following vacuum equations:

$$T\, e^{\gamma_E\, \phi} \;=\; -\, \frac{\beta_E^{(p)}\, h^2}{\gamma_E}\; e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}$$

$$16\, k'\, e^{\,-\,2\,C} \;=\; \frac{h^2\left(p\;+\;1\;-\;\frac{2\,\beta_E^{(p)}}{\gamma_E}\right)\, e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}}{(7\;-\;p)}$$

$$(A')^2 \;=\; k\, e^{\,-\,2\,A} \;+\; \frac{h^2}{16(p\;+\;1)}\left(7\;-\;p\;+\;\frac{2\,\beta_E^{(p)}}{\gamma_E}\right)\, e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}$$

we have obtained, from the results almost equals of the equations, putting

$4096\, e^{-\pi\sqrt{18}}$ instead of

$$e^{\,-\,2\,(8\,-\,p)\,C\,+\,2\,\beta_E^{(p)}\,\phi}$$

a new possible mathematical connection between the two exponentials. Thence, also the values concerning *p*, *C*, *βE* and ϕ correspond to the exponents of *e* (i.e. of exp). Thence we obtain for p = 5 and *βE* = 1/2:

$$e^{-6C+\phi} = 4096e^{-\pi\sqrt{18}}$$

Therefore, with respect to the exponentials of the vacuum equations, the Ramanujan's exponential has a coefficient of 4096 which is equal to 642, while -6C+ϕ is equal to -$\pi\sqrt{18}$. From this it follows that it is possible to establish mathematically, the dilaton value.

For

exp((-Pi*sqrt(18))   we obtain:

Input:

$\exp\left(-\pi \sqrt{18}\right)$

Exact result:

$e^{-3 \sqrt{2} \pi}$

Decimal approximation:

$1.6272016226072509292942156739117979541838581136954016... \times 10^{-6}$

$1.6272016... * 10^{-6}$

Property:

$e^{-3 \sqrt{2} \pi}$ is a transcendental number

Series representations:

$$e^{-\pi \sqrt{18}} = e^{-\pi \sqrt{17} \sum_{k=0}^{\infty} 17^{-k} \binom{1/2}{k}}$$

$$e^{-\pi \sqrt{18}} = \exp\left(-\pi \sqrt{17} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{17}\right)^k \left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$e^{-\pi \sqrt{18}} = \exp\left(-\frac{\pi \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 17^{-s} \Gamma\left(-\frac{1}{2} - s\right) \Gamma(s)}{2 \sqrt{\pi}}\right)$$

Now, we have the following calculations:

$$e^{-6C+\phi} = 4096 e^{-\pi\sqrt{18}}$$

$$e^{-\pi\sqrt{18}} = 1.6272016... * 10\text{^-}6$$

from which:

$$\frac{1}{4096} e^{-6C+\phi} = 1.6272016\ldots * 10\text{^-6}$$

$$0.000244140625\, e^{-6C+\phi} = e^{-\pi\sqrt{18}} = 1.6272016\ldots * 10\text{^-6}$$

Now:

$$\ln\left(e^{-\pi\sqrt{18}}\right) = -13.328648814475 = -\pi\sqrt{18}$$

And:

(1.6272016* 10^-6) *1/ (0.000244140625)

Input interpretation:

$$\frac{1.6272016}{10^6} \times \frac{1}{0.000244140625}$$

Result:

0.0066650177536

0.006665017...

Thence:

$$0.000244140625\, e^{-6C+\phi} = e^{-\pi\sqrt{18}}$$

Dividing both sides by 0.000244140625, we obtain:

$$\frac{0.000244140625}{0.000244140625} e^{-6C+\phi} = \frac{1}{0.000244140625} e^{-\pi\sqrt{18}}$$

$$e^{-6C+\phi} = 0.0066650177536$$

((((exp((-Pi*sqrt(18)))))))*1/0.000244140625

Input interpretation:

$$\exp\left(-\pi\sqrt{18}\right)\times\frac{1}{0.000244140625}$$

Result:

0.00666501785...

0.00666501785…

Series representations:

$$\frac{\exp\left(-\pi\sqrt{18}\right)}{0.000244141} = 4096\exp\left(-\pi\sqrt{17}\sum_{k=0}^{\infty}17^{-k}\binom{\frac{1}{2}}{k}\right)$$

$$\frac{\exp\left(-\pi\sqrt{18}\right)}{0.000244141} = 4096\exp\left(-\pi\sqrt{17}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{17}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\exp\left(-\pi\sqrt{18}\right)}{0.000244141} = 4096\exp\left(-\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}17^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)$$

Now:

$e^{-6C+\phi}$ = 0.0066650177536

$$\exp\left(-\pi\sqrt{18}\right)\times\frac{1}{0.000244140625} =$$

$$e^{-\pi\sqrt{18}}\times\frac{1}{0.000244140625}$$

= 0.00666501785…

From:

ln(0.00666501784619)

Input interpretation:

log(0.00666501784619)

Result:

–5.010882647757…

-5.010882647757…

Alternative representations:

$$\log(0.006665017846190000) = \log_e(0.006665017846190000)$$

$$\log(0.006665017846190000) = \log(a)\log_a(0.006665017846190000)$$

$$\log(0.006665017846190000) = -\text{Li}_1(0.993334982153810000)$$

Series representations:

$$\log(0.006665017846190000) = -\sum_{k=1}^{\infty}\frac{(-1)^k(-0.993334982153810000)^k}{k}$$

$$\log(0.00666501784619000) = 2 i \pi \left\lfloor \frac{\arg(0.00666501784619000 - x)}{2 \pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.00666501784619000 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(0.00666501784619000) = \left\lfloor \frac{\arg(0.00666501784619000 - z_0)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(0.00666501784619000 - z_0)}{2 \pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.00666501784619000 - z_0)^k z_0^{-k}}{k}$$

Integral representation:

$$\log(0.00666501784619000) = \int_1^{0.00666501784619000} \frac{1}{t} \, dt$$

In conclusion:

$$-6C + \phi = -5.010882647757 \ldots$$

and for C = 1, we obtain:

$\phi = -5.010882647757 + 6 = \mathbf{0.989117352243} = \boldsymbol{\phi}$

Note that the values of n_s (spectral index) 0.965, of the average of the Omega mesons Regge slope 0.987428571 and of the dilaton 0.989117352243, are also connected to the following two Rogers-Ramanujan continued fractions:

$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}} - \varphi + 1} = 1 - \frac{e^{-\pi}}{1 + \frac{e^{-2\pi}}{1 + \frac{e^{-3\pi}}{1 + \frac{e^{-4\pi}}{1 + \ldots}}}} \approx 0.9568666373$$

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

(http://www.bitman.name/math/article/102/109/)

Also performing the 512th root of the inverse value of the Pion meson rest mass 139.57, we obtain:

((1/(139.57)))^1/512

Input interpretation:

$$\sqrt[512]{\frac{1}{139.57}}$$

Result:

0.9904007327086440275509737557133014154607327961785555551684...

0.99040073.... result very near to the dilaton value $\mathbf{0.989117352243 = \phi}$ and to the value of the following Rogers-Ramanujan continued fraction:

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

From

March 27, 2018

AdS Vacua from Dilaton Tadpoles and Form Fluxes

J. Mourad and A. Sagnotti - arXiv:1612.08566v2 [hep-th] 22 Feb 2017

We have:

$$e^{2C} = \frac{2\,\xi\, e^{\frac{\phi}{2}}}{1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}}$$
$$\frac{h^2}{32} = \frac{\xi^7 e^{4\phi}}{\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right)^7}\left[\frac{42}{\xi}\left(1 \pm \sqrt{1 - \frac{\xi T}{3} e^{2\phi}}\right) + 5\,T\,e^{2\phi}\right] . \qquad (2.7)$$

For

$T = \frac{16}{\pi^2}$

$\xi = 1$

we obtain:

(2*e^(0.989117352243/2)) / (1+sqrt(((1-1/3*16/(Pi)^2*e^(2*0.989117352243)))))

Input interpretation:

$$\frac{2\, e^{0.989117352243/2}}{1 + \sqrt{1 - \frac{1}{3} \times \frac{16}{\pi^2}\, e^{2\times 0.989117352243}}}$$

Result:

0.83941881822... −
1.4311851867... i

Polar coordinates:

$r = 1.65919106525$ (radius), $\theta = -59.607521917°$ (angle)

1.65919106525….. result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Series representations:

$$\frac{2\,e^{0.98911735224300000/2}}{1+\sqrt{1-\frac{16\,e^{2\times 0.98911735224300000}}{3\,\pi^2}}} = \frac{2\,e^{0.4945586761215000}}{1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\ \sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}}$$

$$\frac{2\,e^{0.98911735224300000/2}}{1+\sqrt{1-\frac{16\,e^{2\times 0.98911735224300000}}{3\,\pi^2}}} = \frac{2\,e^{0.4945586761215000}}{1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}$$

$$\frac{2\,e^{0.98911735224300000/2}}{1+\sqrt{1-\frac{16\,e^{2\times 0.98911735224300000}}{3\,\pi^2}}} = \frac{2\,e^{0.4945586761215000}}{1+\sqrt{z_0}\ \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From

$$\frac{h^2}{32} = \frac{\xi^7\,e^{4\phi}}{\left(1 \pm \sqrt{1-\frac{\xi T}{3}\,e^{2\phi}}\right)^7}\left[\frac{42}{\xi}\left(1 \pm \sqrt{1-\frac{\xi T}{3}\,e^{2\phi}}\right) + 5\,T\,e^{2\phi}\right]$$

We obtain:

e^(4*0.989117352243) / (((1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))))^7 [42(1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))+5*16/(Pi)^2*e^(2*0.989117352243)]

Input interpretation:

$$\frac{e^{4\times 0.989117352243}}{\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}}\right)+5\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}\right)$$

Result:

50.84107889… −
20.34506335… i

Polar coordinates:

$r = 54.76072411$ (radius), $\theta = -21.80979492°$ (angle)

54.76072411…..

Series representations:

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.98911735224300000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.98911735224300000}}{\pi^2}\right)e^{4\times 0.98911735224300000}\right)\Big/\left(1+\sqrt{1-\frac{16\,e^{2\times 0.98911735224300000}}{3\,\pi^2}}\right)^7 =$$

$$\left(2\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/$$

$$\left(\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right) e^{4\times 0.9891173522430000}\right) \Big/ \left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7 =$$

$$\left(2\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2 \sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}} \sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right) \Big/ \left(\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}} \sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k \left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right) e^{4\times 0.9891173522430000}\right) \Big/ \left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7 =$$

$$\left(2\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2 \sqrt{z_0} \sum_{k=0}^{\infty}\frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)\right) \Big/ \left(\pi^2\left(1+\sqrt{z_0} \sum_{k=0}^{\infty}\frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)$$

for $(\text{not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))$

From which:

e^(4*0.989117352243) / (((1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243))))))^7 [42(1+sqrt(1-1/3*16/(Pi)^2*e^(2*0.989117352243)))+5*16/(Pi)^2*e^(2*0.989117352243)]*1/34

Input interpretation:

$$\frac{e^{4\times 0.989117352243}}{\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1-\frac{1}{3}\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}}\right)+5\times\frac{16}{\pi^2}\,e^{2\times 0.989117352243}\right)\times\frac{1}{34}$$

Result:

1.495325850… −
0.5983842161… i

Polar coordinates:

$r = 1.610609533$ (radius), $\theta = -21.80979492°$ (angle)

1.610609533…. result that is a good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(34\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7\right)=$$

$$\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)\Big/\left(17\,\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\left(\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(34\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7\right)=$$

$$\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/$$

$$\left(17\,\pi^2\left(1+\sqrt{-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}}\sum_{k=0}^{\infty}\frac{\left(-\frac{3}{16}\right)^k\left(-\frac{e^{1.978234704486000}}{\pi^2}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)$$

$$\left(\left(42\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)+\frac{5\times 16\,e^{2\times 0.9891173522430000}}{\pi^2}\right)e^{4\times 0.9891173522430000}\right)\Big/\left(34\left(1+\sqrt{1-\frac{16\,e^{2\times 0.9891173522430000}}{3\,\pi^2}}\right)^7\right)=$$

$$\left(40\,e^{5.934704113458000}+21\,e^{3.956469408972000}\,\pi^2+21\,e^{3.956469408972000}\,\pi^2\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)\Big/$$

$$\left(17\,\pi^2\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1-\frac{16\,e^{1.978234704486000}}{3\,\pi^2}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

Now, we have:

$$e^{2C} = \frac{2\xi e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3} e^{2\phi}}}, \tag{2.9}$$

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right]^7} \left[42\left(1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right) - 13\Lambda e^{2\phi}\right]. \tag{2.10}$$

For:

$\xi = 1$

$\Lambda \simeq \frac{4\pi^2}{25}$

$\phi = 0.989117352243$

From

$$e^{2C} = \frac{2\xi e^{-\frac{\phi}{2}}}{1 + \sqrt{1 + \frac{\xi\Lambda}{3} e^{2\phi}}},$$

we obtain:

((2*e^(-0.989117352243/2))) / ((((1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))))))

Input interpretation:

$$\frac{2\, e^{-0.989117352243/2}}{1 + \sqrt{1 + \frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right) e^{2\times 0.989117352243}}}$$

Result:

0.382082347529...

0.382082347529….

Series representations:

$$\frac{2 e^{-0.98911735224300000/2}}{1+\sqrt{1+\frac{(4\pi^2) e^{2\times 0.98911735224300000}}{3\times 25}}} = 2 \Big/ \left(e^{0.49455867612150000} \left(1+\sqrt{\frac{4 e^{1.978234704486000}\pi^2}{75}} \sum_{k=0}^{\infty} \left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\pi^2\right)^{-k} \binom{\frac{1}{2}}{k}\right)\right)$$

$$\frac{2 e^{-0.98911735224300000/2}}{1+\sqrt{1+\frac{(4\pi^2) e^{2\times 0.98911735224300000}}{3\times 25}}} = 2 \Big/ \left(e^{0.49455867612150000} \left(1+\sqrt{\frac{4 e^{1.978234704486000}\pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right)$$

$$\frac{2 e^{-0.98911735224300000/2}}{1+\sqrt{1+\frac{(4\pi^2) e^{2\times 0.98911735224300000}}{3\times 25}}} = \frac{2}{e^{0.49455867612150000} \left(1+\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1+\frac{4 e^{1.978234704486000}\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

1+1/(((4((2*e^(-0.989117352243/2))) / ((((1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))))))))

Input interpretation:

$$1+\frac{1}{4\times \frac{2 e^{-0.989117352243/2}}{1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right) e^{2\times 0.989117352243}}}}$$

Result:

1.65430921270...

1.6543092….. We note that, the result 1.6543092... is very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164.2696$ i.e. 1.65578...

Indeed:

$$G_{505} = P^{-1/4}Q^{1/6} = (\sqrt{5}+2)^{1/2}\left(\frac{\sqrt{5}+1}{2}\right)^{1/4}(\sqrt{101}+10)^{1/4}$$
$$\times\left((130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}}\right)^{1/6}.$$

Thus, it remains to show that

$$(130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}} = \left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3,$$

which is straightforward. □

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578\ldots$$

Series representations:

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224300000/2}\right)}{1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.98911735224300000}}{3\times 25}}}} =$$

$$1+\frac{e^{0.49455867612150000}}{8}+\frac{1}{8}\,e^{0.49455867612150000}\sqrt{\frac{4\,e^{1.97823470448600000}\,\pi^2}{75}}$$
$$\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.97823470448600000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224430000/2}\right)}{1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.98911735224430000}}{3\times 25}}}} =$$

$$1+\frac{e^{0.49455867612150000}}{8}+\frac{1}{8}\,e^{0.49455867612150000}\sqrt{\frac{4\,e^{1.97823470448600 0}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224430000/2}\right)}{1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.98911735224430000}}{3\times 25}}}} = 1+\frac{e^{0.49455867612150000}}{8}+$$

$$\frac{1}{8}\,e^{0.49455867612150000}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

And from

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1+\sqrt{1+\frac{\Lambda}{3}e^{2\phi}}\right]^7}\left[42\left(1+\sqrt{1+\frac{\Lambda}{3}e^{2\phi}}\right)-13\,\Lambda\,e^{2\phi}\right].$$

we obtain:

e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))-13*(4Pi^2)/25*e^(2*0.989117352243)]

Input interpretation:

$$\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)$$

Result:

−0.034547055658...

-0.034547055658…

Series representations:

$$\left(\left(42\left(1+\sqrt{1+\frac{\left(4\pi^2\right)e^{2\times 0.98911735224300000}}{3\times 25}}-\frac{1}{25}\left(4\pi^2\right)13\,e^{2\times 0.98911735224300000}\right)\right)e^{-4\times 0.98911735224300000}\right)\Big/\left(1+\sqrt{1+\frac{\left(4\pi^2\right)e^{2\times 0.98911735224300000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(42\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/\left(25\,e^{5.934704113458000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)$$

$$\left(\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times0.9891173522430000}}{3\times25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times0.9891173522430000}\right)\right.\right.$$
$$\left.e^{-4\times0.9891173522430000}\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times0.9891173522430000}}{3\times25}}\right)^7=$$
$$-\left(\left(42\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-\right.\right.\right.$$
$$25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}$$
$$\left.\left.\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/\left(25\,e^{5.934704113458000}\right.$$
$$\left.\left.\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)$$

$$\left(\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times0.9891173522430000}}{3\times25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times0.9891173522430000}\right)\right.\right.$$
$$\left.e^{-4\times0.9891173522430000}\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times0.9891173522430000}}{3\times25}}\right)^7=$$
$$-\left(\left(42\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\right.\right.\right.$$
$$\left.\left.\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\right)\Big/\left(25\right.$$
$$e^{5.934704113458000}$$
$$\left.\left.\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From which:

47 *1/(((-1/((((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))]))))))))

Input interpretation:

$$47\left(-\left(1/1/\left(\frac{e^{-4\times0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times0.989117352243}}-13\left(\frac{1}{25}(4\pi^2)\right)e^{2\times0.989117352243}\right)\right)\right)\right)\right)$$

Result:

1.6237116159...

1.6237116159…. result that is an approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$-\left(47/1/\left(e^{-4\times0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times0.9891173522430000}}{3\times25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times0.9891173522430000}\right)\right)\right)/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times0.9891173522430000}}{3\times25}}\right)^7\right)=$$

$$\left(1974\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)/\left(25\,e^{5.934704113458000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)$$

$$-\left(47 \Big/ 1 \Big/ \left(e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)=$$

$$\left(1974\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/\left(25\,e^{5.934704113458000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)$$

$$-\left(47 \Big/ 1 \Big/ \left(e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)=$$

$$\left(1974\left(-25\,e^{1.978234704486000}+52\,e^{3.956469408972000}\,\pi^2-25\,e^{1.978234704486000}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\right)\Big/\left(25\,e^{5.934704113458000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

And again:

32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))]))))

Input interpretation:

$$32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)\right)$$

Result:

-1.1055057810...

-1.1055057810….

We note that the result -1.1055057810…. is very near to the value of Cosmological Constant, less 10^{-52} , thence 1.1056, with minus sign

Series representations:

$$\left(32 e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2) e^{2\times 0.9891173522430000}}{3\times 25}}\right.\right.\right. -$$

$$\left.\left.\left.\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/$$

$$\left(1+\sqrt{1+\frac{(4\pi^2) e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(1344\left(-25 e^{1.978234704486000}+52 e^{3.956469408972000}\pi^2-\right.\right.\right.$$

$$25 e^{1.978234704486000}\sqrt{\frac{4 e^{1.978234704486000}\pi^2}{75}}$$

$$\left.\left.\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\right)\Big/\left(25 e^{5.934704113458000}\right.$$

$$\left.\left.\left(1+\sqrt{\frac{4 e^{1.978234704486000}\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k \left(e^{1.978234704486000}\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)$$

$$\left(32\, e^{-4\times 0.9891173522430000} \left(42 \left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}} - \frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right) \Big/ \left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(1344\left(-25\, e^{1.978234704486000} + 52\, e^{3.956469408972000}\, \pi^2 - 25\, e^{1.978234704486000} \sqrt{\frac{4\, e^{1.978234704486000}\, \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\, \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right) \Big/ \left(25\, e^{5.934704113458000} \left(1+\sqrt{\frac{4\, e^{1.978234704486000}\, \pi^2}{75}} \sum_{k=0}^{\infty} \frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\, \pi^2\right)^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)$$

$$\left(32\, e^{-4\times 0.9891173522430000} \left(42 \left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}} - \frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right) \Big/ \left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7 =$$

$$-\left(\left(1344\left(-25\, e^{1.978234704486000} + 52\, e^{3.956469408972000}\, \pi^2 - 25\, e^{1.978234704486000} \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1+\frac{4\, e^{1.978234704486000}\, \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!}\right)\right) \Big/ \left(25\, e^{5.934704113458000} \left(1+\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(1+\frac{4\, e^{1.978234704486000}\, \pi^2}{75} - z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \le 0$))

And:

-[32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))])))]^5

Input interpretation:

$$-\left(32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)\right)\right)^5$$

Result:

1.651220569...

1.651220569…. result very near to the 14th root of the following Ramanujan's class invariant $Q=\left(G_{505}/G_{101/5}\right)^3$ = 1164.2696 i.e. 1.65578...

Series representations:

$$-\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)^5 =$$

$$\left(4\,385\,270\,057\,140\,224\left(-25+52\, e^{1.978234704486000}\,\pi^2-25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^5\right)\Big/\left(9\,765\,625\, e^{19.78234704486000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^{35}\right)$$

$$-\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)^5 =$$

$$\left(4\,385\,270\,057\,140\,224\left(-25+52\, e^{1.978234704486000}\,\pi^2-25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\Big/$$

$$\left(9\,765\,625\, e^{19.78234704486000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k \left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^{35}\right)$$

$$-\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)^5 =$$

$$\left(4\,385\,270\,057\,140\,224\left(-25+52\, e^{1.978234704486000}\,\pi^2-25\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^5\right)\Big/$$

$$\left(9\,765\,625\, e^{19.78234704486000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^{35}\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

We obtain also:

-[32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))-13*(4Pi^2)/25*e^(2*0.989117352243))])))))]^1/2

Input interpretation:

$$-\sqrt{\left(32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}}-13\left(\frac{1}{25}\left(4\pi^2\right)\right)e^{2\times 0.989117352243}\right)\right)\right)\right)}$$

Result:

-0
$1.0514303501\ldots\, i$

Polar coordinates:

$r = 1.05143035007$ (radius), $\theta = -90°$ (angle)

1.05143035007

Series representations:

$$-\sqrt{\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)} = -\frac{8}{5}\sqrt{21}$$

$$\sqrt{\left(\left(25-52\, e^{1.978234704486000}\,\pi^2+25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)}$$

$$-\sqrt{\left(\left(32 e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)} = -\frac{8}{5}\sqrt{21}\sqrt{\left(\left(25-52 e^{1.978234704486000}\pi^2+25\sqrt{\frac{4e^{1.978234704486000}\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4e^{1.978234704486000}\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)}$$

$$-\sqrt{\left(\left(32 e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)} = -\frac{8}{5}\sqrt{21}\sqrt{\left(\left(25-52 e^{1.978234704486000}\pi^2+25\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4e^{1.978234704486000}\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4e^{1.978234704486000}\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

1 / -[32((((e^(-4*0.989117352243) / [1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))]^7 * [42(1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243))))- 13*(4Pi^2)/25*e^(2*0.989117352243))]))))]^1/2

Input interpretation:

$$-\left(1\Big/\left(\sqrt{\left(32\left(\frac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}}\right)^7}\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}}\right)-13\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}\right)\right)\right)}\right)\right)$$

Result:

0.95108534763... i

Polar coordinates:

$r = 0.95108534763$ (radius), $\theta = 90°$ (angle)

0.95108534763

We know that the primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index $n_s = 0.965 \pm 0.004$, consistent with the predictions of slow-roll, single-field, inflation.

Thence 0.95108534763 is a result very near to the spectral index n_s, to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 and to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}}-\varphi+1}=1-\cfrac{e^{-\pi}}{1+\cfrac{e^{-2\pi}}{1+\cfrac{e^{-3\pi}}{1+\cfrac{e^{-4\pi}}{1+\dots}}}}\approx 0.9568666373$$

Series representations:

$$-\left(1\Big/\left(\sqrt{\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)}\right)\right)=$$

$$-\left(5\Big/\left(8\sqrt{21}\sqrt{\left(\left(\left(25-52\, e^{1.978234704486000}\,\pi^2+25\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4\, e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}\right)^7\right)\right)\right)}\right)\right)$$

$$-\left(1\Big/\left(\sqrt{\left(\left(32\,e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}-\frac{1}{25}(4\pi^2)\,13\,e^{2\times 0.9891173522430000}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{(4\pi^2)\,e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)}\right)\right)=$$

$$-\left(5\Big/\left(8\sqrt{21}\sqrt{\left(\left(25-52\,e^{1.978234704486000}\,\pi^2+25\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(e^{3.956469408972000}\left(1+\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^7\right)\right)}\right)\right)$$

$$-\left(1\Bigg/\left(\sqrt{\left(\left(32\, e^{-4\times 0.9891173522430000}\left(42\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\;-\frac{1}{25}(4\pi^2)\, 13\, e^{2\times 0.9891173522430000}\right)\right)\right)\Bigg/\left(1+\sqrt{1+\frac{(4\pi^2)\, e^{2\times 0.9891173522430000}}{3\times 25}}\right)^7\right)}\right)\right) =$$

$$-\left(5\Bigg/\left(8\sqrt{21}\sqrt{\left(\left(25-52\, e^{1.978234704486000}\,\pi^2+25\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)\Bigg/\left(e^{3.956469408972000}\left(1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\, e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}\right)^7\right)\right)}\right)\right)$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \le 0$))

From the previous expression

$$\frac{\dfrac{e^{-4\times 0.989117352243}}{\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}}\right)^7}}{\left(42\left(1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}}\;-13\left(\frac{1}{25}(4\pi^2)\right)e^{2\times 0.989117352243}\right)\right)}$$

= -0.034547055658…

we have also:

1+1/(((4((2*e^(-0.989117352243/2))) / ((((1+sqrt(((1+1/3*(4Pi^2)/25*e^(2*0.989117352243)))))))))) + (-0.034547055658)

Input interpretation:

$$1+\frac{1}{4\times\frac{2\,e^{-0.989117352243/2}}{1+\sqrt{1+\frac{1}{3}\left(\frac{1}{25}\left(4\,\pi^2\right)\right)e^{2\times0.989117352243}}}}-0.034547055658$$

Result:

1.61976215705...

1.61976215705….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224300000/2}\right)}{1+\sqrt{1+\frac{\left(4\,\pi^2\right)e^{2\times0.98911735224300000}}{3\times25}}}}-0.0345470556580000=$$
$$0.9654529443420000+\frac{e^{0.49455867612150000}}{8}+\frac{1}{8}\,e^{0.49455867612150000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\left(\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\binom{\frac{1}{2}}{k}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224300000/2}\right)}{1+\sqrt{1+\frac{\left(4\,\pi^2\right)e^{2\times0.98911735224300000}}{3\times25}}}}-0.0345470556580000=$$
$$0.9654529443420000+\frac{e^{0.49455867612150000}}{8}+\frac{1}{8}\,e^{0.49455867612150000}\sqrt{\frac{4\,e^{1.978234704486000}\,\pi^2}{75}}\sum_{k=0}^{\infty}\frac{\left(-\frac{75}{4}\right)^k\left(e^{1.978234704486000}\,\pi^2\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$1+\frac{1}{\frac{4\left(2\,e^{-0.98911735224300000/2}\right)}{1+\sqrt{1+\frac{(4\,\pi^2)\,e^{2\times0.98911735224300000}}{3\times25}}}}-0.0345470556580000 =$$

$$0.9654529443420000+\frac{e^{0.4945586761215000}}{8}+$$

$$\frac{1}{8}\,e^{0.4945586761215000}\,\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(1+\frac{4\,e^{1.978234704486000}\,\pi^2}{75}-z_0\right)^k z_0^{-k}}{k!}$$

for (not ($z_0 \in \mathbb{R}$ and $-\infty < z_0 \leq 0$))

From

Properties of Nilpotent Supergravity
E. Dudas, S. Ferrara, A. Kehagias and A. Sagnotti - arXiv:1507.07842v2 [hep-th] 14 Sep 2015

We have that:

Cosmological inflation with a tiny tensor–to–scalar ratio r, consistently with PLANCK data, may also be described within the present framework, for instance choosing

$$\alpha(\Phi) \;=\; i\,M\left(\Phi\;+\;b\,\Phi\,e^{ik\,\Phi}\right)\;. \tag{4.35}$$

This potential bears some similarities with the Kähler moduli inflation of [32] and with the poly–instanton inflation of [33]. One can verify that $\chi = 0$ solves the field equations, and that the potential along the $\chi = 0$ trajectory is now

$$V \;=\; \frac{M^2}{3}\left(1\;-\;a\,\phi\,e^{-\gamma\,\phi}\right)^2\;. \tag{4.36}$$

We analyzing the following equation:

$$V \;=\; \frac{M^2}{3}\left(1\;-\;a\,\phi\,e^{-\gamma\,\phi}\right)^2\;.$$

$$\phi \;=\; \varphi\;-\;\frac{\sqrt{6}}{k}\;,$$

$$a \;=\; \frac{b\,\gamma}{e}\;<\;0\;,\qquad \gamma\;=\;\frac{k}{\sqrt{6}}\;<\;0\;.$$

We have:

(M^2)/3*[1-(b/euler number * k/sqrt6) * (φ- sqrt6/k) * exp(-(k/sqrt6)(φ- sqrt6/k))]^2

i.e.

V = (M^2)/3*[1-(b/euler number * k/sqrt6) * (φ- sqrt6/k) * exp(-(k/sqrt6)(φ- sqrt6/k))]^2

For k = 2 and φ = 0.9991104684, that is the value of the scalar field that is equal to the value of the following Rogers-Ramanujan continued fraction:

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

we obtain:

V = (M^2)/3*[1-(b/euler number * 2/sqrt6) * (0.9991104684- sqrt6/2) * exp(-(2/sqrt6)(0.9991104684- sqrt6/2))]^2

Input interpretation:

$$V = \frac{M^2}{3}\left(1-\left(\frac{b}{e}\times\frac{2}{\sqrt{6}}\right)\left(0.9991104684-\frac{\sqrt{6}}{2}\right)\exp\left(-\frac{2}{\sqrt{6}}\left(0.9991104684-\frac{\sqrt{6}}{2}\right)\right)\right)^2$$

Result:

$$V = \frac{1}{3}(0.0814845\,b+1)^2 M^2$$

Solutions:

$$b = \frac{225.913\left(-0.054323\, M^2 \pm 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2} \quad (M \neq 0)$$

Alternate forms:

$$V = 0.00221324\,(b + 12.2723)^2\, M^2$$

$$V = 0.00221324\left(b^2\, M^2 + 24.5445\, b\, M^2 + 150.609\, M^2\right)$$

$$-0.00221324\, b^2\, M^2 - 0.054323\, b\, M^2 - \frac{M^2}{3} + V = 0$$

Expanded form:

$$V = 0.00221324\, b^2\, M^2 + 0.054323\, b\, M^2 + \frac{M^2}{3}$$

Alternate form assuming b, M, and V are positive:

$$V = 0.00221324\,(b + 12.2723)^2\, M^2$$

Alternate form assuming b, M, and V are real:

$$V = 0.00221324\, b^2\, M^2 + 0.054323\, b\, M^2 + 0.333333\, M^2 + 0$$

Derivative:

$$\frac{\partial}{\partial b}\left(\frac{1}{3}\,(0.0814845\, b + 1)^2\, M^2\right) = 0.054323\,(0.0814845\, b + 1)\, M^2$$

Implicit derivatives:

$$\frac{\partial b(M, V)}{\partial V} = \frac{154317775011120075}{36961748\,(226802245 + 18480874\,b)\,M^2}$$

$$\frac{\partial b(M, V)}{\partial M} = -\frac{\frac{226802245}{18480874} + b}{M}$$

$$\frac{\partial M(b, V)}{\partial V} = \frac{154317775011120075}{2\,(226802245 + 18480874\,b)^2\,M}$$

$$\frac{\partial M(b, V)}{\partial b} = -\frac{18480874\,M}{226802245 + 18480874\,b}$$

$$\frac{\partial V(b, M)}{\partial M} = \frac{2\,(226802245 + 18480874\,b)^2\,M}{154317775011120075}$$

$$\frac{\partial V(b, M)}{\partial b} = \frac{36961748\,(226802245 + 18480874\,b)\,M^2}{154317775011120075}$$

Global minimum:

$$\min\left\{\frac{1}{3}\,(0.0814845\,b + 1)^2\,M^2\right\} = 0 \text{ at } (b, M) = (-16, 0)$$

Global minima:

$$\min\left\{\frac{1}{3} M^2 \left(1 - \frac{(b\ 2)\left(0.9991104684 - \frac{\sqrt{6}}{2}\right)\exp\left(-\frac{2\left(0.9991104684-\frac{\sqrt{6}}{2}\right)}{\sqrt{6}}\right)}{e\sqrt{6}}\right)^2\right\} = 0$$

for $b = -\frac{226\,802\,245}{18\,480\,874}$

$$\min\left\{\frac{1}{3} M^2 \left(1 - \frac{(b\ 2)\left(0.9991104684 - \frac{\sqrt{6}}{2}\right)\exp\left(-\frac{2\left(0.9991104684-\frac{\sqrt{6}}{2}\right)}{\sqrt{6}}\right)}{e\sqrt{6}}\right)^2\right\} = 0$$

for $M = 0$

From:

$$b = \frac{225.913\left(-0.054323\, M^2 \pm 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2} \quad (M \neq 0)$$

we obtain

(225.913 (-0.054323 M^2 + 6.58545×10^-10 sqrt(M^4)))/M^2

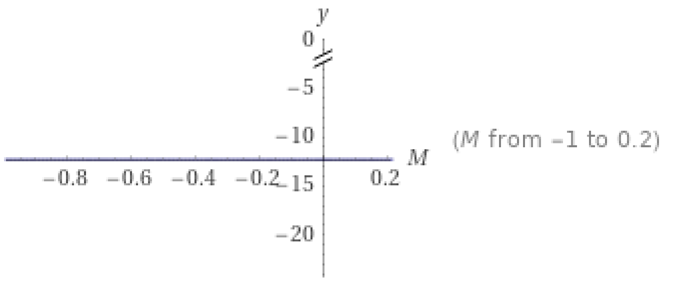
Input interpretation:

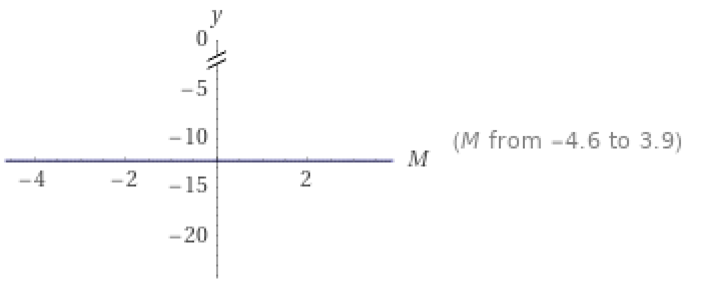
$$\frac{225.913\left(-0.054323\, M^2 + 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}$$

Result:

$$\frac{225.913\left(6.58545\times 10^{-10}\sqrt{M^4}-0.054323\,M^2\right)}{M^2}$$

Plots:





Alternate form assuming M is real:

-12.2723

-12.2723 result very near to the black hole entropy value 12.1904 = ln(196884)

Alternate forms:

$$-\frac{12.2723\left(M^2-1.21228\times 10^{-8}\sqrt{M^4}\right)}{M^2}$$

$$\frac{1.48774\times 10^{-7}\sqrt{M^4} - 12.2723\, M^2}{M^2}$$

Expanded form:

$$\frac{1.48774\times 10^{-7}\sqrt{M^4}}{M^2} - 12.2723$$

Property as a function:

Parity

even

Series expansion at M = 0:

$$\left(\frac{1.48774\times 10^{-7}\sqrt{M^4}}{M^2} - 12.2723\right) + O\left(M^6\right)$$

(generalized Puiseux series)

Series expansion at M = ∞:

$$-12.2723$$

Derivative:

$$\frac{d}{dM}\left(\frac{225.913\left(6.58545\times 10^{-10}\sqrt{M^4} - 0.054323\, M^2\right)}{M^2}\right) = \frac{3.55271\times 10^{-15}}{M}$$

Indefinite integral:

$$\int \frac{225.913\left(-0.054323\, M^2 + 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}\, dM =$$
$$\frac{1.48774\times 10^{-7}\sqrt{M^4}}{M} - 12.2723\, M + \text{constant}$$

Global maximum:

$$\max\left\{\frac{225.913\left(6.58545\times 10^{-10}\sqrt{M^4} - 0.054323\, M^2\right)}{M^2}\right\} =$$
$$-\frac{140\,119\,826\,723\,990\,341\,497\,649}{11\,417\,594\,849\,251\,000\,000\,000} \text{ at } M = -1$$

Global minimum:

$$\min\left\{\frac{225.913\left(6.58545\times 10^{-10}\sqrt{M^4} - 0.054323\, M^2\right)}{M^2}\right\} =$$
$$-\frac{140\,119\,826\,723\,990\,341\,497\,649}{11\,417\,594\,849\,251\,000\,000\,000} \text{ at } M = -1$$

Limit:

$$\lim_{M\to\pm\infty} \frac{225.913\left(-0.054323\, M^2 + 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2} = -12.2723$$

Definite integral after subtraction of diverging parts:

$$\int_0^{\infty}\left(\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}--12.2723\right)dM=0$$

From b that is equal to

$$\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}$$

from:

$$V=\frac{1}{3}\,(0.0814845\,b+1)^2\,M^2$$

we obtain:

1/3 (0.0814845 ((225.913 (-0.054323 M^2 + 6.58545×10^-10 sqrt(M^4)))/M^2) + 1)^2 M^2

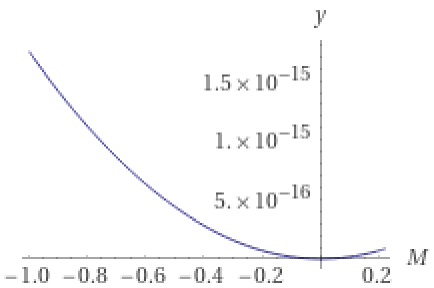
Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

Result:

0

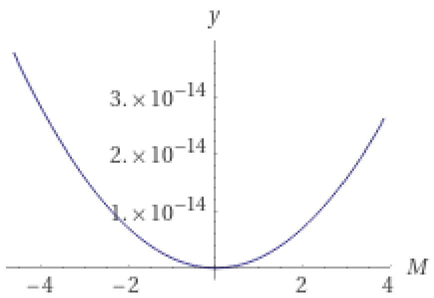
Plots: **(possible mathematical connection with an open string)**



(M from −1 to 0.2)

M = -0.5; M = 0.2

(possible mathematical connection with an open string)



(M from −4.6 to 3.9)

M = 2 ; M = 3

Root:

$M = 0$

Property as a function:

Parity

even

Series expansion at M = 0:

$O(M^{62194})$

(Taylor series)

Series expansion at M = ∞:

$1.75541\times 10^{-15}\, M^2 + O\left(\left(\frac{1}{M}\right)^{62194}\right)$

(Taylor series)

Definite integral after subtraction of diverging parts:

$$\int_0^\infty \left(\frac{1}{3} M^2 \left(1 + \frac{18.4084\left(-0.054323\, M^2 + 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2}\right)^2 - 1.75541\times 10^{-15}\, M^2\right) dM = 0$$

For M = - 0.5 , we obtain:

$$\frac{1}{3}\left(0.0814845\times \frac{225.913\left(-0.054323\, M^2 + 6.58545\times 10^{-10}\sqrt{M^4}\right)}{M^2} + 1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 (-0.5)^2 + 6.58545×10^-10 sqrt((-0.5)^4)))/(-0.5)^2) + 1)^2 * (-0.5^2)

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,(-0.5)^2+6.58545\times10^{-10}\sqrt{(-0.5)^4}\right)}{(-0.5)^2}+1\right)^2\left(-0.5^2\right)$$

Result:

$$-4.38851344947464545348970783378088020833333333333333333\ldots\times10^{-16}$$

$-4.38851344947*10^{-16}$

For M = 0.2:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 0.2^2 + 6.58545×10^-10 sqrt(0.2^4)))/0.2^2) + 1)^2 0.2^2

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\times0.2^2+6.58545\times10^{-10}\sqrt{0.2^4}\right)}{0.2^2}+1\right)^2\times0.2^2$$

Result:

$7.021621519159432725583532534049408333333333333333333333333\ldots \times 10^{-17}$

7.021621519159*10^-17

For M = 3:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 3^2 + 6.58545×10^-10 sqrt(3^4)))/3^2) + 1)^2 3^2

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\times3^2+6.58545\times10^{-10}\sqrt{3^4}\right)}{3^2}+1\right)^2\times3^2$$

Result:

$1.5798648418108723632562948201611168750 \times 10^{-14}$

1.57986484181*10^-14

For M = 2:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\,M^2+6.58545\times10^{-10}\sqrt{M^4}\right)}{M^2}+1\right)^2 M^2$$

1/3 (0.0814845 ((225.913 (-0.054323 2^2 + 6.58545×10^-10 sqrt(2^4)))/2^2) + 1)^2 2^2

Input interpretation:

$$\frac{1}{3}\left(0.0814845\times\frac{225.913\left(-0.054323\times2^2+6.58545\times10^{-10}\sqrt{2^4}\right)}{2^2}+1\right)^2\times2^2$$

Result:

$7.02162151915943272558353253404940833333333333333333333333\ldots\times10^{-15}$

$7.021621519*10^{-15}$

From the four results

7.021621519*10^-15 ; 1.57986484181*10^-14 ; 7.021621519159*10^-17 ;

-4.38851344947*10^-16

we obtain, after some calculations:

sqrt[1/(2Pi)(7.021621519*10^-15 + 1.57986484181*10^-14 +7.021621519*10^-17 - 4.38851344947*10^-16)]

Input interpretation:

$$\sqrt{\frac{1}{2\pi}\left(7.021621519\times 10^{-15} + 1.57986484181\times 10^{-14} + 7.021621519\times 10^{-17} - 4.38851344947\times 10^{-16}\right)}$$

Result:

$5.9776991059\ldots \times 10^{-8}$

$5.9776991059*10^{-8}$ result very near to the Planck's electric flow 5.975498×10^{-8} that is equal to the following formula:

$$\phi_P^E = \mathbf{E}_P l_P^2 = \phi_P l_P = \sqrt{\frac{\hbar c}{\varepsilon_0}}$$

We note that:

1/55*(([(((1/[(7.021621519*10^-15 + 1.57986484181*10^-14 +7.021621519*10^-17 -4.38851344947*10^-16)])))^1/7]-((log^(5/8)(2))/(2 2^(1/8) 3^(1/4) e log^(3/2)(3)))))

Input interpretation:

$$\frac{1}{55}\left(\left(1/\left(7.021621519\times 10^{-15} + 1.57986484181\times 10^{-14} + 7.021621519\times 10^{-17} - 4.38851344947\times 10^{-16}\right)\right) ^\wedge (1/7) - \frac{\log^{5/8}(2)}{2\sqrt[8]{2}\sqrt[4]{3}\, e \log^{3/2}(3)}\right)$$

log(x) is the natural logarithm

Result:

1.6181818182…

1.6181818182… result that is a very good approximation to the value of the golden ratio 1.618033988749...

From the Planck units:

Planck Length

$$l_P = \sqrt{\frac{4\pi\hbar G}{c^3}}$$

5.729475 * 10^{-35} Lorentz-Heaviside value

Planck's Electric field strength

$$\mathbf{E}_P = \frac{F_P}{q_P} = \sqrt{\frac{c^7}{16\pi^2 \varepsilon_0 \hbar G^2}}$$

1.820306 * 10^{61} V*m Lorentz-Heaviside value

Planck's Electric flux

$$\phi_P^E = \mathbf{E}_P l_P^2 = \phi_P l_P = \sqrt{\frac{\hbar c}{\varepsilon_0}}$$

5.975498*10^{-8} V*m Lorentz-Heaviside value

Planck’s Electric potential

$$\phi_P = V_P = \frac{E_P}{q_P} = \sqrt{\frac{c^4}{4\pi\varepsilon_0 G}}$$

$1.042940*10^{27}$ V Lorentz-Heaviside value

Relationship between Planck’s Electric Flux and Planck’s Electric Potential

$E_P * l_P$ = $(1.820306 * 10^{61}) * 5.729475 * 10^{-35}$

Input interpretation:

$$\frac{(1.820306\times10^{61})\times5.729475}{10^{35}}$$

Result:

1042939771935000000000000000

Scientific notation:

$1.042939771935\times10^{27}$

$1.042939771935*10^{27} \approx 1.042940*10^{27}$

Or:

$E_P * l_P^2 / l_P$ = $(5.975498*10^{-8})*1/(5.729475 * 10^{-35})$

Input interpretation:

$$5.975498\times10^{-8}\times\frac{1}{\frac{5.729475}{10^{35}}}$$

Result:

$1.042939885417075735560413475929295441554418162222542205001 33\ldots\times10^{27}$

$1.042939885417*10^{27} \approx 1.042940*10^{27}$

Observations

We note that, from the number 8, we obtain as follows:

8^2

64

$8^2 \times 2 \times 8$

1024

$8^4 = 8^2 \times 2^6$

True

$8^4 = 4096$

$8^2 \times 2^6 = 4096$

$2^{13} = 2 \times 8^4$

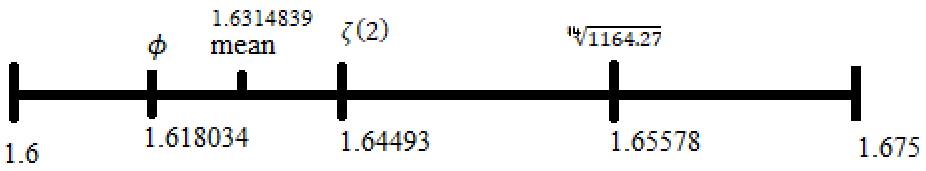
True

$2^{13} = 8192$

$2 \times 8^4 = 8192$

We notice how from the numbers 8 and 2 we get 64, 1024, 4096 and 8192, and that 8 is the fundamental number. In fact 8^2 = 64, 8^3 = 512, 8^4 = 4096. We define it "fundamental number", since 8 is a Fibonacci number, which by rule, divided by the previous one, which is 5, gives 1.6 , a value that tends to the golden ratio, as for all numbers in the Fibonacci sequence

“Golden” Range



Finally we note how $8^2 = 64$, multiplied by 27, to which we add 1, is equal to 1729, the so-called "Hardy-Ramanujan number". Then taking the 15th root of 1729, we obtain a value close to ζ(2) that 1.6438 ..., which, in turn, is included in the range of what we call "golden numbers"

Furthermore for all the results very near to 1728 or 1729, adding $64 = 8^2$, one obtain values about equal to 1792 or 1793. These are values almost equal to the Planck multipole spectrum frequency 1792.35 and to the hypothetical Gluino mass

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