On Ramanujan's mathematics applied to various sectors of Theoretical Physics and Cosmology: further possible new mathematical connections. II

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Abstract

In this research thesis, we have analyzed further Ramanujan equations and described the new possible mathematical connections with various sectors of Theoretical Physics (principally like-Higgs boson dilaton mass solutions) and Cosmology

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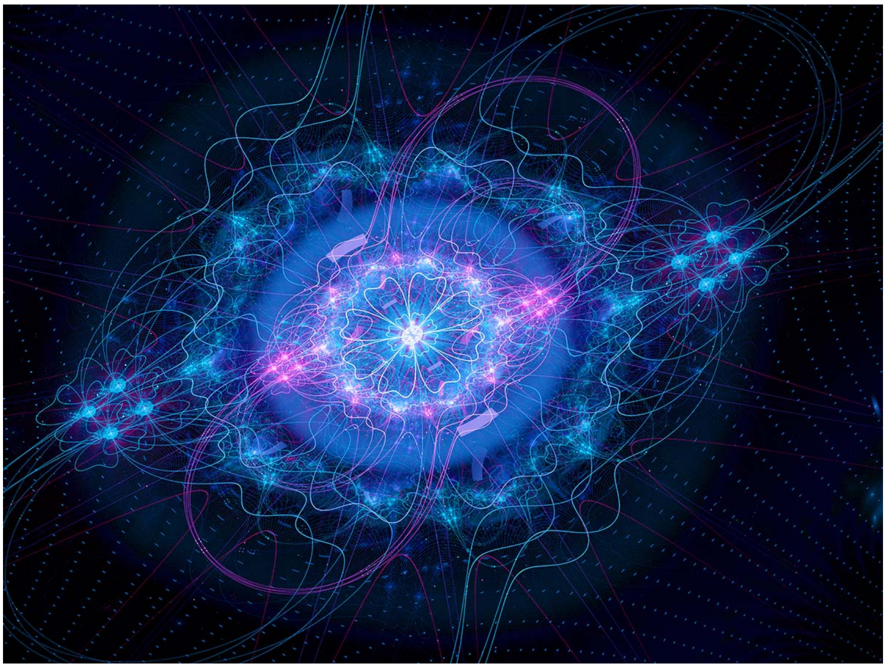
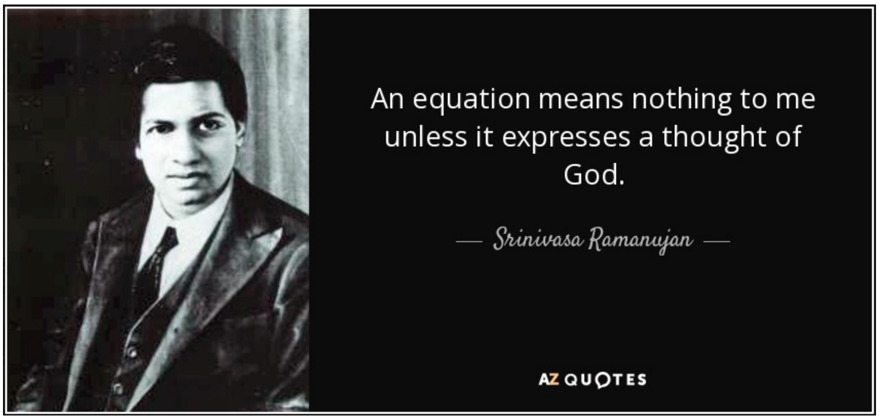


https://asgardia.space/en/news/Seems-There-a-Fifth-Fundamental-Force-in-Town

All the known forces of nature can be traced to 4 fundamental interactions: gravitational, electromagnetic, strong and weak forces. After spotting the same anomaly twice in two different atoms, scientists suggest that there's a fifth force mediated by newly-discovered boson, a so-called X-17 particle

https://imsbharat.wordpress.com/2016/12/22/national-mathematics-day-celebrating-ramanujams-birth-anniversary/



From:

Islands outside the horizon

Ahmed Almheiri, Raghu Mahajan, Juan Maldacena

arXiv:1910.11077v2 [hep-th] 11 Nov 2019

We have that:

$$S = \frac{c}{3} \log \frac{\beta}{\pi} . \qquad (27)$$

$$S = \frac{c}{3} \log \left[\frac{\pi}{\beta} \cosh \left(\frac{2\pi t}{\beta} \right) \right] \longrightarrow \frac{2\pi}{3} c \frac{t}{\beta} + \ldots \quad \text{for} \quad t \gg \beta . \qquad (31)$$

where S represent the entropy. Now, we have, for to obtain β:

54*10^8/3 * ln(x/Pi) = (2Pi*54*10^8*16777216)*1/(3x)

Where t = 16777216 = 64^4 and c = $54*10^8$

Input interpretation:

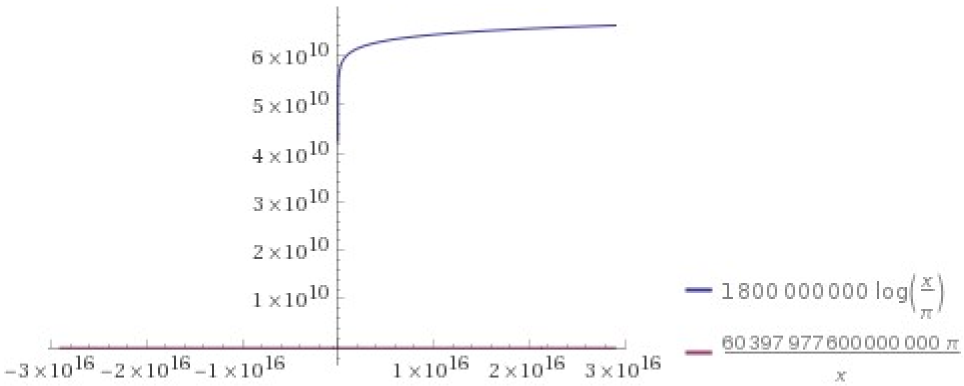
$$\frac{54 \times 10^8}{3} \log\left(\frac{x}{\pi}\right) = (2\pi \times 54 \times 10^8 \times 16\,777\,216) \times \frac{1}{3x}$$

log(x) is the natural logarithm

Result:

$$1\,800\,000\,000 \log\left(\frac{x}{\pi}\right) = \frac{60\,397\,977\,600\,000\,000\,\pi}{x}$$

Plot:



Alternate form assuming x is real:

$$\frac{33554432\pi}{x} + \log(\pi) = \log(x)$$

Alternate form:

$$1800000000\,(\log(x) - \log(\pi)) = \frac{60397977600000000\pi}{x}$$

Alternate form assuming x>0:

$$1800000000\log(x) - 1800000000\log(\pi) = \frac{60397977600000000\pi}{x}$$

Alternate form assuming x is positive:

$$x\log(\pi) + 33554432\pi = x\log(x)$$

Solution:

$$x \approx 7.19817\times 10^{6}$$

t = 16777216 = 64^4 ; β = 7198170

we have:

$$b > \beta.$$

$$a \approx b + \frac{\beta}{2\pi}\log\left(\frac{24\pi\phi_r}{c\beta}\right) , \qquad \text{for} \qquad \frac{\phi_r}{c\beta} \gg 1 . \tag{21}$$

For the following data:

b = 7600000; $\frac{\phi_r}{c\beta} \gg 1 = 16$; β = 7198170 $\phi_r = 16 * 54 * 10\text{^}8 * 7198170 =$ 621.921.888.000.000.000

$\phi_r =$ 6.21921888000000000 * 10^{17}

c = 54q; q << 10^{15} ; c = 54 $*$ 10^8

7600000+(7198170/(2Pi)) ln ((((24Pi*621921888000000000)/(54*621921888000000000))))

Input:

$$7600000 + \frac{7198170}{2\pi}\log\left(\frac{24\pi\times 621921888000000000}{54\times 621921888000000000}\right)$$

log(x) is the natural logarithm

Exact result:

$$7600000+\frac{3599085\log\left(\frac{4\pi}{9}\right)}{\pi}$$

Decimal approximation:

$7.9824090251193366790038283935351590602402205753498916 6\ldots\times 10^6$

$7.9824090251193*10^6$

Alternate forms:

$$7600000+\frac{3599085\left(\log(\pi)-\log\left(\frac{9}{4}\right)\right)}{\pi}$$

$$\frac{5\left(1520000\pi+719817\log\left(\frac{4\pi}{9}\right)\right)}{\pi}$$

$$7600000+\frac{7198170\log(2)-7198170\log(3)}{\pi}+\frac{3599085\log(\pi)}{\pi}$$

Alternative representations:

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=7600000+\frac{7198170\log_e\left(\frac{14926125312000000000\pi}{33583781952000000000}\right)}{2\pi}$$

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=7600000+\frac{7198170\log(a)\log_a\left(\frac{14926125312000000000\pi}{33583781952000000000}\right)}{2\pi}$$

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=7600000-\frac{7198170\,\mathrm{Li}_1\left(1-\frac{14926125312000000000\pi}{33583781952000000000}\right)}{2\pi}$$

Series representations:

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=7600000-\frac{3599085\sum_{k=1}^{\infty}\frac{\left(1-\frac{4\pi}{9}\right)^k}{k}}{\pi}$$

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=$$
$$7600000+7198170\,i\left\lfloor\frac{\arg\left(\frac{4\pi}{9}-x\right)}{2\pi}\right\rfloor+$$
$$\frac{3599085\log(x)}{\pi}-\frac{3599085\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{4\pi}{9}-x\right)^k x^{-k}}{k}}{\pi}\quad\text{for } x<0$$

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=$$
$$7600000+7198170\,i\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+$$
$$\frac{3599085\log(z_0)}{\pi}-\frac{3599085\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{4\pi}{9}-z_0\right)^k z_0^{-k}}{k}}{\pi}$$

Integral representations:

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=7600000+\frac{3599085}{\pi}\int_1^{\frac{4\pi}{9}}\frac{1}{t}\,dt$$

$$7600000+\frac{\log\left(\frac{24\pi\,621921888000000000}{54\times 621921888000000000}\right)7198170}{2\pi}=$$
$$7600000-\frac{3599085\,i}{2\pi^2}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\frac{4\pi}{9}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

Thence: a = 7.9824090251193*10^6

We have that:

The computation of the bulk entanglement entropy is similar to that of a thermal state on the plane, except that we have to include the appropriate warp factor term from the metric (18). In fact, the bulk entropy computation is simplest in the (x^+, x^-) coordinates since the stress tensor vanishes and we have just the vacuum formulas. We then have to transform to (y^+, y^-) coordinates and keep track of the warp factors and transformation of the UV cutoffs.

We consider an interval on the right side of the form $[0, b]_R$ that includes part of the right bath and the quantum mechanical degrees of freedom at 0_R. We look for an entanglement wedge that consists of the interval $[-a, b]$, see figure 4. Its generalized entropy is

$$S_{\text{gen}}(a) = \frac{2\pi\phi_r}{\beta} \frac{1}{\tanh \frac{2\pi}{\beta} a} + \frac{c}{6} \log \frac{\sinh^2 \frac{\pi(a+b)}{\beta}}{\sinh \frac{2\pi a}{\beta}} + \text{constant}\,. \tag{19}$$

From

$$S_{\text{gen}}(a) = \frac{2\pi\phi_r}{\beta} \frac{1}{\tanh \frac{2\pi}{\beta} a} + \frac{c}{6} \log \frac{\sinh^2 \frac{\pi(a+b)}{\beta}}{\sinh \frac{2\pi a}{\beta}} + \text{constant}\,. \quad (19)$$

we obtain:

(2Pi*6.21921888e+17)/7198170 *1/(tanh(2Pi*7.9824090251193e+6)/7198170))

(2Pi*6.21921888e+17)/7198170

Input interpretation:

$$\frac{2\pi \times 6.21921888 \times 10^{17}}{7198170}$$

Result:

$5.42867211... \times 10^{11}$

5.42867211 × 10^11 * 1/ tanh(((2Pi*7982409.025)/7198170))

Input interpretation:

$$5.42867211 \times 10^{11} \times \frac{1}{\tanh\left(\frac{2\pi \times 7.982409025 \times 10^6}{7198170}\right)}$$

tanh(x) is the hyperbolic tangent function

Result:

$5.42868174... \times 10^{11}$

$5.42868174... * 10^{11}$

(54*10^8)/6 ln((((((sinh^2(((Pi(7600000+7982409.025)/(7198170)))))/(((sinh(((2Pi*7600000)/(7198170))))))))))

Input interpretation:

$$\frac{54\times 10^8}{6}\log\left(\frac{\sinh^2\left(\pi\times\frac{7\,600\,000+7.982409025\times 10^6}{7\,198\,170}\right)}{\sinh\left(\frac{2\pi\times 7\,600\,000}{7\,198\,170}\right)}\right)$$

$\sinh(x)$ is the hyperbolic sine function

$\log(x)$ is the natural logarithm

Result:

$5.647130122\ldots\times 10^9$

Thence, in conclusion, we obtain from

$$S_{\text{gen}}(a)=\frac{2\pi\phi_r}{\beta}\frac{1}{\tanh\frac{2\pi}{\beta}a}+\frac{c}{6}\log\frac{\sinh^2\frac{\pi(a+b)}{\beta}}{\sinh\frac{2\pi a}{\beta}}+\text{constant}\,. \tag{19}$$

5.42867211 × 10^11 * 1/ tanh(((2Pi*7982409.025)/7198170))+(54*10^8)/6 ln((((((sinh^2(((Pi(7600000+7982409.025)/(7198170)))))/(((sinh(((2Pi*7600000)/(7198170))))))))))

Input interpretation:

$$5.42867211\times 10^{11}\times\frac{1}{\tanh\left(\frac{2\pi\times 7.982409025\times 10^6}{7\,198\,170}\right)}+\frac{54\times 10^8}{6}\log\left(\frac{\sinh^2\left(\pi\times\frac{7\,600\,000+7.982409025\times 10^6}{7\,198\,170}\right)}{\sinh\left(\frac{2\pi\times 7\,600\,000}{7\,198\,170}\right)}\right)$$

$\tanh(x)$ is the hyperbolic tangent function

$\sinh(x)$ is the hyperbolic sine function

$\log(x)$ is the natural logarithm

Result:

$5.48515304\ldots\times 10^{11}$

$5.48515304\ldots*10^{11}$ that is the generalized entropy

Or, for a = 7290000 = $729*10^4$ where 729 is the Ramanujan cube 9^3, we obtain:

5.42867211 × 10^11 * 1/ tanh(((2Pi*7982409.025)/7198170))+(54*10^8)/6 ln((((((sinh^2(((Pi(7290000+7982409.025)/(7198170)))))/(((sinh(((2Pi*7290000)/(7198170))))))))))

Input interpretation:

$$5.42867211\times 10^{11}\times \frac{1}{\tanh\left(\frac{2\pi\times 7.982409025\times 10^{6}}{7\,198\,170}\right)}+\frac{54\times 10^{8}}{6}\log\left(\frac{\sinh^2\left(\pi\times\frac{7\,290\,000+7.982409025\times 10^{6}}{7\,198\,170}\right)}{\sinh\left(\frac{2\pi\times 7\,290\,000}{7\,198\,170}\right)}\right)$$

tanh(x) is the hyperbolic tangent function

sinh(x) is the hyperbolic sine function

log(x) is the natural logarithm

Result:

$5.485153045430974806506333309768017344729466498913 8989\ldots\times 10^{11}$

$5.48515304\ldots*10^{11}$ exactly the same above result!

Inserting this value of entropy 5.485153e+11 in the Hawking radiation calculator, we obtain:

Mass = 0.006900779

Radius = 1.024663e-29

Temperature = 1.778355e+25

From the Ramanujan-Nardelli mock formula, we obtain:

sqrt[[[[1/(((((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(0.006900779)* sqrt[[-(((((1.778355e+25 * 4*Pi*(1.024663e-29)^3-(1.024663e-29)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\sqrt{1\Bigg/\left(\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times\frac{1}{0.006900779}\sqrt{-\frac{1.778355\times 10^{25}\times 4\pi\,(1.024663\times 10^{-29})^3-(1.024663\times 10^{-29})^2}{6.67\times 10^{-11}}}\right)}$$

Result:

1.6182494155713169588876872607375585326536710116360476687 45...

1.6182494155…

And:

1/sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(0.006900779)* sqrt[[-((((1.778355e+25 * 4*Pi*(1.024663e-29)^3-(1.024663e-29)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\frac{1}{\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times\frac{1}{0.006900779}\sqrt{-\frac{1.778355\times 10^{25}\times 4\pi(1.024663\times 10^{-29})^3-(1.024663\times 10^{-29})^2}{6.67\times 10^{-11}}}}}}$$

Result:

0.61795171398035308792576374130130443682286717613761186 2466...

0.617951713…

Furthermore, we obtain also:

1/((((((5.42867211 × 10^11 * 1/ tanh(((2Pi*7982409.025)/7198170))+(54*10^8)/6 ln((((((sinh^2(((Pi(7600000+7982409.025)/(7198170)))))/(((sinh(((2Pi*7600000)/(7198170))))))))))))))))^1/4096

Input interpretation:

$$1/\left(\left(5.42867211\times 10^{11}\times\frac{1}{\tanh\left(\frac{2\pi\times 7.982409025\times 10^6}{7\,198\,170}\right)}+\frac{54\times 10^8}{6}\log\left(\frac{\sinh^2\left(\pi\times\frac{7\,600\,000+7.982409025\times 10^6}{7\,198\,170}\right)}{\sinh\left(\frac{2\pi\times 7\,600\,000}{7\,198\,170}\right)}\right)\right)\wedge(1/4096)\right)$$

$\tanh(x)$ is the hyperbolic tangent function

$\sinh(x)$ is the hyperbolic sine function

$\log(x)$ is the natural logarithm

Result:

0.993422488624...

0.993422488624.... 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 dilaton value $\mathbf{0.989117352243} = \boldsymbol{\phi}$

1/[1/((((((5.42867211 × 10^11 * 1/ tanh(((2Pi*7982409.025)/7198170))+(54*10^8)/6 ln((((((sinh^2(((Pi(7600000+7982409.025)/(7198170)))))/(((sinh(((2Pi*7600000)/(7198170)))))))))))))))^1/4096]^744

Input interpretation:

$$1\Bigg/\left(1\Bigg/\left(\left(5.42867211\times 10^{11}\times\frac{1}{\tanh\left(\frac{2\pi\times 7.982409025\times 10^6}{7198170}\right)}+\frac{54\times 10^8}{6}\log\left(\frac{\sinh^2\left(\pi\times\frac{7600000+7.982409025\times 10^6}{7198170}\right)}{\sinh\left(\frac{2\pi\times 7600000}{7198170}\right)}\right)\right)\hat{}\,(1/4096)\right)\right)^{744}$$

tanh(x) is the hyperbolic tangent function

sinh(x) is the hyperbolic sine function

log(x) is the natural logarithm

Result:

135.616828...

135.616828…. result very near to the rest mass of Pion meson 134.9766

Now, we have that:

b = 7600000; $\frac{\phi_r}{c\beta} \gg 1 = 16$; β = 7198170 $\phi_r = 16 * 54 * 10\hat{}8 * 7198170 =$ 621.921.888.000.000.000 ; $\phi_r = 6.21921888000000000 * 10^{17}$; c = 54q;

q << 10^{15} ; c = 54 ∗ 10^8 a = 7.9824090251193*10^6

From

$$S_{\text{gen}}(a) = \phi_0 + \frac{\phi_r}{a} + S_{\text{bulk}}\ , \quad S_{\text{bulk}} = \frac{c}{6}\log\left[\frac{(a+b)^2}{a}\right] + \text{constant}\ . \qquad (5)$$

we obtain:

(54e+8/6) ln ((((7.982409025e+6 + 7600000)^2 / (7.982409025e+6))))

Input interpretation:

$$\frac{54\times 10^8}{6}\log\left(\frac{(7.982409025\times 10^6 + 7600000)^2}{7.982409025\times 10^6}\right)$$

log(x) is the natural logarithm

Result:

$1.5507500051\ldots\times 10^{10}$

$1.5507500051\ldots*10^{10}$

From the ratio between the previous result, we obtain:

(5.48515304e+11 /1.5507500051 × 10^10)*1/(golden ratio)^2 - 0.9568666373

Where 0.9568666373 is the following Rogers-Ramanujan continued fraction:

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

Input interpretation:

$$\frac{5.48515304\times 10^{11}}{1.5507500051\times 10^{10}}\times\frac{1}{\phi^2} - 0.9568666373$$

ϕ is the golden ratio

Result:

12.5536413...

12.5536413... result very near to the S_{BH} entropy 12.5664

Or:

(5.48515304e+11 /1.5507500051 × 10^10)*1/(golden ratio)^2 - 0.9991104684

Where 0.9991104684 is the value of the following Rogers-Ramanujan continued fraction:

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

Input interpretation:

$$\frac{5.48515304 \times 10^{11}}{1.5507500051 \times 10^{10}} \times \frac{1}{\phi^2} - 0.9991104684$$

ϕ is the golden ratio

Result:

12.5113975...

12.5113975... result very near to the S entropy 12.5372

Now, from (5), we can to obtain ϕ_0

$$S_{\text{gen}}(a) = \phi_0 + \frac{\phi_r}{a} + S_{\text{bulk}}\ , \quad S_{\text{bulk}} = \frac{c}{6}\log\left[\frac{(a+b)^2}{a}\right] + \text{constant}\,. \qquad (5)$$

5.48515304e+11 = x + (6.21921888e+17/7.982409025e+6)+(54e+8/6) ln ((((7.982409025e+6 + 7600000)^2 / (7.982409025e+6))))

Input interpretation:

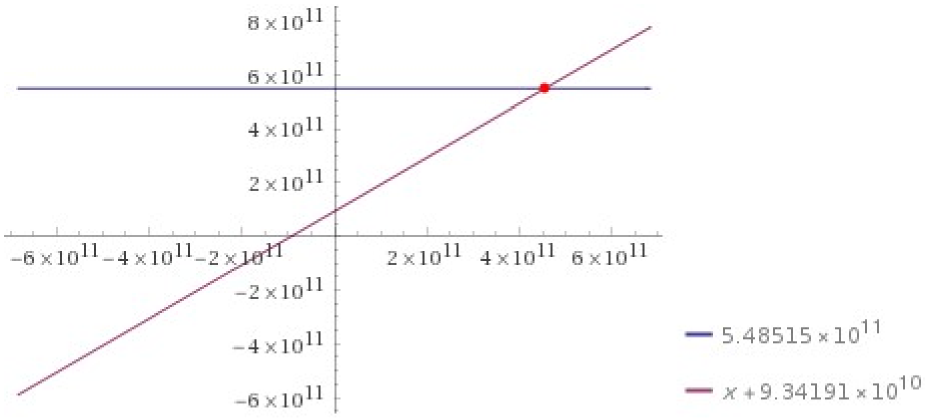
$$5.48515304 \times 10^{11} = x + \frac{6.21921888 \times 10^{17}}{7.982409025 \times 10^6} + \frac{54 \times 10^8}{6} \log\left(\frac{(7.982409025 \times 10^6 + 7\,600\,000)^2}{7.982409025 \times 10^6}\right)$$

$\log(x)$ is the natural logarithm

Result:

$5.48515 \times 10^{11} = x + 9.34191 \times 10^{10}$

Plot:



Alternate forms:

$5.48515 \times 10^{11} = x + 9.34191 \times 10^{10}$

$4.55096 \times 10^{11} - x = 0$

Solution:

$x \approx 4.55096 \times 10^{11}$

$4.55096 * 10^{11} = \phi_0$

Thence:

$$S_{\max} = 2S_{\rm BH} = 2\left(\phi_0 + \frac{2\pi\phi_r}{\beta}\right) \quad (32)$$

2(4.55096e+11 + (2Pi*6.21921888e+17 / 7198170))

Input interpretation:

$$2\left(4.55096 \times 10^{11} + 2\,\pi \times \frac{6.21921888 \times 10^{17}}{7\,198\,170}\right)$$

Result:

$1.99593... \times 10^{12}$

$1.99593...*10^{12}$ that is the maximal entropy

From the two values obtained, performing the division, we have:

1.99593e+12 / 5.48515304e+11

(1.99593e+12) /(5.48515304e+11)

Input interpretation:

$$\frac{1.99593\times10^{12}}{5.48515304\times10^{11}}$$

Result:

3.638786348247450175063848355268497668024956328292346060047...

3.638786348

(1/(2*golden ratio - 1/5 * golden ratio))*((1.99593e+12) /(5.48515304e+11))^3

Input interpretation:

$$\frac{1}{2\phi-\frac{1}{5}\phi}\left(\frac{1.99593\times10^{12}}{5.48515304\times10^{11}}\right)^3$$

ϕ is the golden ratio

Result:

16.5428...

16.5428.... result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Now, we have:

With regard the mathematical constant 0.393625563.... we have that the real solution of x+Ci(x) is equal to 0.39362556340804009... The unique real-valued fixed point of -Ci(z) (cosine integral – math constant):

$$\sqrt{\frac{1}{798}(6675-1558\,e-469\,\pi-1216\log(2))}\approx 0.3936255634080400909862$$

Adding the golden ratio to this value, and multiplying the result by golden ratio and by the previous expression, we obtain:

(0.39362556340804009+golden ratio)*(golden ratio)(((1.99593e+12)/(5.48515304e+11)))

Input interpretation:

$$(0.39362556340804009+\phi)\,\phi\times\frac{1.99593\times10^{12}}{5.48515304\times10^{11}}$$

ϕ is the golden ratio

Result:

11.8440...

11.8440... result practically equal to the S_{BH} entropy 11.8477

From (20)

$$\frac{\sinh\frac{\pi(a-b)}{\beta}}{\sinh\frac{\pi(a+b)}{\beta}} = \frac{12\pi\phi_r}{c\beta}\frac{1}{\sinh\frac{2\pi a}{\beta}}.$$

For:

β = 7198170 ϕ_r = 6.21921888000000000 * 10^{17}

c = 54q q << 10^{15} ; c = 54 ∗ 10^8 a = 7.9824090251193*10^6

We obtain:

(12Pi*6.21921888e+17)/(54e+8*7198170)*1/(((sinh((2Pi*7.982409025e+6)/(7198170)))))

Input interpretation:

$$\frac{12\pi\times 6.21921888\times 10^{17}}{54\times 10^{8}\times 7198170}\times\frac{1}{\sinh\left(\frac{2\pi\times 7.982409025\times 10^{6}}{7198170}\right)}$$

$\sinh(x)$ is the hyperbolic sine function

Result:

1.13613980...

1.13613980…

1/((((12Pi*6.21921888e+17)/(54e+8*7198170)*1/(((sinh((2Pi*7.982409025e+6)/(7198170))))))))^1/16

Input interpretation:

$$\frac{1}{\sqrt[16]{\frac{12\pi\times 6.21921888\times 10^{17}}{54\times 10^{8}\times 7198170}\times\frac{1}{\sinh\left(\frac{2\pi\times 7.982409025\times 10^{6}}{7198170}\right)}}}$$

sinh(x) is the hyperbolic sine function

Result:

0.9920544607...

0.9920544607…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the dilaton value **$0.989117352243=\phi$**

((((12Pi*6.21921888e+17)/(54e+8*7198170)*1/(((sinh((2Pi*7.982409025e+6)/(7198170)))))))^(5Pi/4)

Input interpretation:

$$\left(\frac{12\pi\times 6.21921888\times 10^{17}}{54\times 10^{8}\times 7198170}\times\frac{1}{\sinh\left(\frac{2\pi\times 7.982409025\times 10^{6}}{7198170}\right)}\right)^{5\times\pi/4}$$

sinh(x) is the hyperbolic sine function

Result:

1.6507453...

1.6507453…. is 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...

From:

Scaling solutions for Dilaton Quantum Gravity

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We have that, from the set of flow equations concerning the large field limit of dilaton gravity, the following expressions:

$$A_V = \frac{1}{192\pi^2}\left(9\epsilon^3 + 82\epsilon^2 + 612\epsilon + 2760\right) \quad (5)$$

The simultaneous zero at $\epsilon = \epsilon_0 = 109.97$, as well as the pole at $\epsilon = -6$ are clearly visible.

1/(192*Pi^2) * (9*-6^3+ 82*-6^2+ 612*-6 +2760)

Input:

$$\frac{1}{192\,\pi^2}\left(9\times(-1)\times 6^3 + 82\times(-1)\times 6^2 + 612\times(-6) + 2760\right)$$

Result:

$$-\frac{121}{4\,\pi^2}$$

Decimal approximation:

-3.06496580518071758617735376209426107685685293383545810257...

-3.06496580518…

Property:

$-\frac{121}{4\,\pi^2}$ is a transcendental number

Alternative representations:

$$\frac{9\,(-1)\,6^3 + 82\,(-1)\,6^2 + 612\,(-6) + 2760}{192\,\pi^2} = \frac{-912 - 82\times 6^2 - 9\times 6^3}{192\,(180\,°)^2}$$

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=\frac{-912-82\times 6^2-9\times 6^3}{1152\,\zeta(2)}$$

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=\frac{-912-82\times 6^2-9\times 6^3}{192\,(-i\log(-1))^2}$$

Series representations:

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=-\frac{121}{64\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=-\frac{121}{64\left(\sum_{k=0}^{\infty}\frac{(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^2}$$

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=-\frac{121}{4\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2}$$

Integral representations:

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=-\frac{121}{64\left(\int_0^1\sqrt{1-t^2}\,dt\right)^2}$$

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=-\frac{121}{16\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^2}$$

$$\frac{9(-1)6^3+82(-1)6^2+612(-6)+2760}{192\pi^2}=-\frac{121}{16\left(\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt\right)^2}$$

1/(192*Pi^2) * (9*109.97^3+ 82*109.97^2+ 612*109.97 +2760)

Input interpretation:

$$\frac{1}{192\pi^2}\left(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760\right)$$

Result:

6876.61…

6876.61…

Alternative representations:

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\pi^2}=\frac{70061.6+82\times 109.97^2+9\times 109.97^3}{192\,(180\,°)^2}$$

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\pi^2}=\frac{70061.6+82\times 109.97^2+9\times 109.97^3}{1152\,\zeta(2)}$$

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\pi^2}=\frac{70061.6+82\times 109.97^2+9\times 109.97^3}{192\,(-i\log(-1))^2}$$

Series representations:

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\pi^2}=\frac{4241.84}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\pi^2}=\frac{16967.3}{\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^2}$$

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\pi^2}=\frac{67869.4}{\left(\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)^2}$$

Integral representations:

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\,\pi^2}=\frac{16\,967.3}{\left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^2}$$

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\,\pi^2}=\frac{4241.84}{\left(\int_0^1 \sqrt{1-t^2}\,dt\right)^2}$$

$$\frac{9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760}{192\,\pi^2}=\frac{16\,967.3}{\left(\int_0^\infty \frac{\sin(t)}{t}\,dt\right)^2}$$

-(6876.606561943517990117 /-3.0649658051807175861 77)-64*8-2

Input interpretation:

$$-\left(-\frac{6876.606561943517990117}{3.064965805180717586177}\right)-64\times 8-2$$

Result:

1729.616078952651515151494932879996712804070048427295178814...

1729.616078…

This result is very near to the mass of candidate glueball $f_0(1710)$ meson. Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. As a consequence, it is sometimes called a Zagier as a pun on the Gross–Zagier theorem. The number 1728 is one less than the Hardy–Ramanujan number 1729

$$A_F=\frac{1}{3456\pi^2}\left(-253\epsilon^3-6094\epsilon^2-36240\epsilon-51840\right) \quad (5)$$

1/(3456*Pi^2)* (-253*-6^3-6094*-6^2-36240*-6-51840)

Input:

$$\frac{1}{3456\,\pi^2}\left(-253\times(-1)\times 6^3-6094\times(-1)\times 6^2-36\,240\times(-6)-51\,840\right)$$

Result:

$$\frac{3053}{24\pi^2}$$

Decimal approximation:

12.88889890250238400909016671580410339895863912809869640106...

12.8888989025…

Property:

$\frac{3053}{24\pi^2}$ is a transcendental number

Alternative representations:

$$\frac{-253(-1)6^3-6094(-1)6^2-36\,240(-6)-51\,840}{3456\pi^2}=\frac{165\,600+6094\times 6^2+253\times 6^3}{3456(180\,°)^2}$$

$$\frac{-253(-1)6^3-6094(-1)6^2-36\,240(-6)-51\,840}{3456\pi^2}=\frac{165\,600+6094\times 6^2+253\times 6^3}{20\,736\,\zeta(2)}$$

$$\frac{-253(-1)6^3-6094(-1)6^2-36\,240(-6)-51\,840}{3456\pi^2}=\frac{165\,600+6094\times 6^2+253\times 6^3}{3456(-i\log(-1))^2}$$

Series representations:

$$\frac{-253(-1)6^3-6094(-1)6^2-36\,240(-6)-51\,840}{3456\pi^2}=\frac{3053}{384\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{-253(-1)6^3-6094(-1)6^2-36\,240(-6)-51\,840}{3456\pi^2}=\frac{3053}{384\left(\sum_{k=0}^{\infty}\frac{(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^2}$$

$$\frac{-253(-1)6^3-6094(-1)6^2-36\,240(-6)-51\,840}{3456\pi^2}=\frac{3053}{24\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2}$$

Integral representations:

$$\frac{-253(-1)6^3 - 6094(-1)6^2 - 36240(-6) - 51840}{3456\pi^2} = \frac{3053}{384\left(\int_0^1 \sqrt{1-t^2}\,dt\right)^2}$$

$$\frac{-253(-1)6^3 - 6094(-1)6^2 - 36240(-6) - 51840}{3456\pi^2} = \frac{3053}{96\left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^2}$$

$$\frac{-253(-1)6^3 - 6094(-1)6^2 - 36240(-6) - 51840}{3456\pi^2} = \frac{3053}{96\left(\int_0^1 \frac{1}{\sqrt{1-t^2}}\,dt\right)^2}$$

1/(3456*Pi^2)* (-253*109.97^3-6094*109.97^2-36240*109.97-51840)

Input interpretation:

$$\frac{1}{3456\pi^2}\left(-253\times 109.97^3 - 6094\times 109.97^2 + 36240\times(-109.97) - 51840\right)$$

Result:

$-12143.4\ldots$

-12143.4…

Alternative representations:

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36240\times 109.97 - 51840}{3456\pi^2} = \frac{-4.03715\times 10^6 - 6094\times 109.97^2 - 253\times 109.97^3}{3456\,(180\,°)^2}$$

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36240\times 109.97 - 51840}{3456\pi^2} = \frac{-4.03715\times 10^6 - 6094\times 109.97^2 - 253\times 109.97^3}{20736\,\zeta(2)}$$

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36240\times 109.97 - 51840}{3456\pi^2} = \frac{-4.03715\times 10^6 - 6094\times 109.97^2 - 253\times 109.97^3}{3456\,(-i\log(-1))^2}$$

Series representations:

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36\,240\times 109.97 - 51\,840}{3456\,\pi^2} = -\frac{7490.63}{\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36\,240\times 109.97 - 51\,840}{3456\,\pi^2} = -\frac{29\,962.5}{\left(-1+\sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}\right)^2}$$

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36\,240\times 109.97 - 51\,840}{3456\,\pi^2} = -\frac{119\,850.}{\left(\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)^2}$$

Integral representations:

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36\,240\times 109.97 - 51\,840}{3456\,\pi^2} = -\frac{29\,962.5}{\left(\int_0^{\infty} \frac{1}{1+t^2}\,dt\right)^2}$$

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36\,240\times 109.97 - 51\,840}{3456\,\pi^2} = -\frac{7490.63}{\left(\int_0^{1} \sqrt{1-t^2}\,dt\right)^2}$$

$$\frac{-253\times 109.97^3 - 6094\times 109.97^2 - 36\,240\times 109.97 - 51\,840}{3456\,\pi^2} = -\frac{29\,962.5}{\left(\int_0^{\infty} \frac{\sin(t)}{t}\,dt\right)^2}$$

From the ln of the ratio between the two previous results, we obtain:

ln(((-((((1/(3456*Pi^2)* (-253*109.97^3-6094*109.97^2-36240*109.97-51840))))) / ((((1/(192*Pi^2) * (9*109.97^3+ 82*109.97^2+ 612*109.97 +2760))))))))

Input interpretation:

$$\log\left(-\frac{\frac{1}{3456\pi^2}\left(-253\times 109.97^3 - 6094\times 109.97^2 + 36\,240\times(-109.97) - 51\,840\right)}{\frac{1}{192\,\pi^2}\left(9\times 109.97^3 + 82\times 109.97^2 + 612\times 109.97 + 2760\right)}\right)$$

log(x) is the natural logarithm

Result:

0.568657...

0.568657… result practically equal to the value of the following Ramanujan continued fraction:

$$4\int_0^\infty \frac{tdt}{e^{\sqrt{5}t}\cosh t} = \cfrac{1}{1+\cfrac{1^2}{1+\cfrac{1^2}{1+\cfrac{2^2}{1+\cfrac{2^2}{1+\cfrac{3^2}{1+\cfrac{3^2}{1+\dots}}}}}}} \approx 0.5683000031$$

Alternative representations:

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right) = \log_e\left(-\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{\frac{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}{192\pi^2}}\right)$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right) = \log(a)\log_a\left(-\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{\frac{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}{192\pi^2}}\right)$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right) = -\mathrm{Li}_1\left(1+\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{\frac{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}{192\pi^2}}\right)$$

Series representations:

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right)=$$
$$-\sum_{k=1}^{\infty}\frac{(-0.765893)^k}{k}$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right)=$$
$$2i\pi\left\lfloor\frac{\arg(1.76589-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.76589-x)^k x^{-k}}{k}\quad\text{for } x<0$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right)=$$
$$\left\lfloor\frac{\arg(1.76589-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(1.76589-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.76589-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right)=\int_1^{1.76589}\frac{1}{t}\,dt$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{\frac{(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)(3456\pi^2)}{192\pi^2}}\right)=$$
$$\frac{1}{2i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{0.266713 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

((288*0.988)*1/10^2) *ln(((-(((((1/(3456*Pi^2)* (-253*109.97^3-6094*109.97^2-36240*109.97-51840))))) / ((((1/(192*Pi^2) * (9*109.97^3+ 82*109.97^2+ 612*109.97 +2760))))))))

Where 288 is equal to 233 + 55, that are Fibonacci numbers and 0.988 is very near to the dilaton value

Input interpretation:

$$\left((288\times 0.988)\times\frac{1}{10^2}\right)\log\left(-\frac{\frac{1}{3456\pi^2}\left(-253\times 109.97^3-6094\times 109.97^2+36\,240\times(-109.97)-51\,840\right)}{\frac{1}{192\pi^2}\left(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760\right)}\right)$$

log(x) is the natural logarithm

Result:

1.618078252589530428708340526797989223967430064790655358180...

1.6180782525…

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

Alternative representations:

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{(3456\pi^2)\left(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760\right)}}{192\pi^2}\right)(288\times 0.988)}{10^2}=\frac{284.544\log_e\left(-\frac{\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{(3456\pi^2)\left(70\,061.6+82\times 109.97^2+9\times 109.97^3\right)}}{192\pi^2}\right)}{10^2}$$

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{(3456\pi^2)\left(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760\right)}}{192\pi^2}\right)(288\times 0.988)}{10^2}=\frac{284.544\log(a)\log_a\left(-\frac{\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{(3456\pi^2)\left(70\,061.6+82\times 109.97^2+9\times 109.97^3\right)}}{192\pi^2}\right)}{10^2}$$

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)(288\times 0.988)}{10^2} = -\frac{284.544\,\text{Li}_1\left(1+\frac{\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}}{192\pi^2}\right)}{10^2}$$

Series representations:

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)(288\times 0.988)}{10^2} = -2.84544\sum_{k=1}^{\infty}\frac{(-0.765893)^k}{k}$$

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)(288\times 0.988)}{10^2} = 5.69088\,i\,\pi\left\lfloor\frac{\arg(1.76589-x)}{2\pi}\right\rfloor + 2.84544\log(x) - 2.84544\sum_{k=1}^{\infty}\frac{(-1)^k (1.76589-x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)(288\times 0.988)}{10^2} = 2.84544\left\lfloor\frac{\arg(1.76589-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) + 2.84544\log(z_0) + 2.84544\left\lfloor\frac{\arg(1.76589-z_0)}{2\pi}\right\rfloor\log(z_0) - 2.84544\sum_{k=1}^{\infty}\frac{(-1)^k (1.76589-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)(288\times 0.988)}{10^2} = 2.84544\int_1^{1.76589}\frac{1}{t}\,dt$$

$$\frac{\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)(288\times 0.988)}{\frac{1.42272}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{0.266713 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0} = 10^2$$

((Pi*0.937) *ln(((-((((1/(3456*Pi^2)* (-253*109.97^3-6094*109.97^2-36240*109.97-51840))))) / ((((1/(192*Pi^2) * (9*109.97^3+ 82*109.97^2+ 612*109.97 +2760))))))))

where 0.937 result very near to the spectral index n_s , to the mesonic Regge slope and to the inflaton value at the end of the inflation 0.9402

Input interpretation:

$$(\pi\times 0.937)\log\left(-\frac{\frac{1}{3456\pi^2}\left(-253\times 109.97^3-6094\times 109.97^2+36240\times(-109.97)-51840\right)}{\frac{1}{192\pi^2}\left(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760\right)}\right)$$

log(x) is the natural logarithm

Result:

1.67394…

1.67394… result very near to the neutron mass

Alternative representations:

$$\log\left(-\frac{\frac{-253\times 109.97^3-6094\times 109.97^2-36240\times 109.97-51840}{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}}{192\pi^2}\right)\pi\, 0.937 = 0.937\pi\log_e\left(-\frac{\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}}{192\pi^2}\right)$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = 0.937\,\pi\log(a)\log_a\left(-\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{\frac{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}{192\pi^2}}\right)$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = -0.937\,\pi\,\mathrm{Li}_1\left(1+\frac{-4.03715\times 10^6-6094\times 109.97^2-253\times 109.97^3}{\frac{(3456\pi^2)(70061.6+82\times 109.97^2+9\times 109.97^3)}{192\pi^2}}\right)$$

Series representations:

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = -0.937\,\pi\sum_{k=1}^{\infty}\frac{(-0.765893)^k}{k}$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = 1.874\, i\,\pi^2\left\lfloor\frac{\arg(1.76589-x)}{2\pi}\right\rfloor+0.937\,\pi\log(x)-0.937\,\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1.76589-x)^k x^{-k}}{k}\quad\text{for } x<0$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = 1.874\, i\,\pi^2\left\lfloor-\frac{-\pi+\arg\left(\frac{1.76589}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+0.937\,\pi\log(z_0)-0.937\,\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1.76589-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = 0.937\pi\int_1^{1.76589}\frac{1}{t}\,dt$$

$$\log\left(-\frac{-253\times 109.97^3-6094\times 109.97^2-36\,240\times 109.97-51\,840}{\frac{(3456\pi^2)(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760)}{192\pi^2}}\right)\pi\, 0.937 = \frac{0.4685}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{0.266713 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

((Pi*x) *ln(((-((((1/(3456*Pi^2)* (-253*109.97^3-6094*109.97^2-36240*109.97-51840))))) / ((((1/(192*Pi^2) * (9*109.97^3+ 82*109.97^2+ 612*109.97 +2760)))))))) = 1.674927

Where 1.674927 is the neutron mass

Input interpretation:

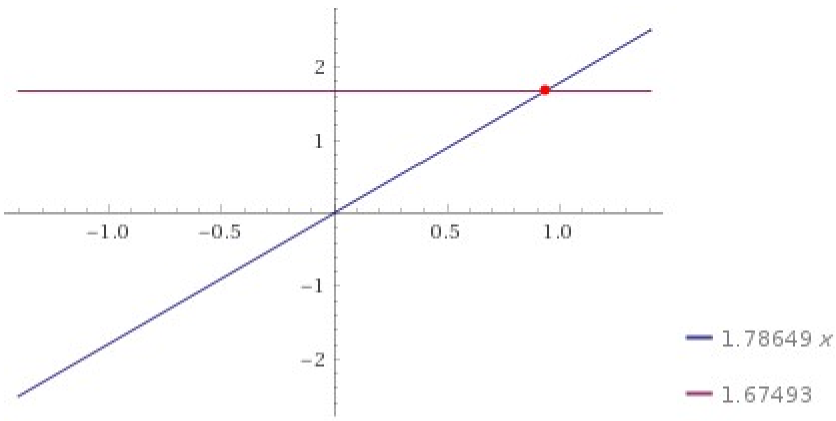
$$(\pi x)\log\left(-\frac{\frac{1}{3456\pi^2}\left(-253\times 109.97^3-6094\times 109.97^2+36\,240\times(-109.97)-51\,840\right)}{\frac{1}{192\pi^2}\left(9\times 109.97^3+82\times 109.97^2+612\times 109.97+2760\right)}\right) = 1.674927$$

$\log(x)$ is the natural logarithm

Result:

$1.78649\,x = 1.67493$

Plot:



Alternate form:

$1.78649\,x - 1.67493 = 0$

Alternate form assuming x is real:

$1.78649\,x + 0 = 1.67493$

Solution:

$x \approx 0.937553$

x = 0.937553 result very near to the spectral index n_s , to the mesonic Regge slope and to the inflaton value at the end of the inflation 0.9402

Now, we have

$$C_K = \frac{1}{36\pi^2}\left(-\epsilon^4 + 90\epsilon^3 + 2079\epsilon^2 + 12636\epsilon + 26244\right)\ . \qquad (5)$$

1/(36Pi^2)*(-(-6)^4+90*-6^3+2079*-6^2+12636*-6+26244)

Input:

$$\frac{1}{36\,\pi^2}\left(-(-6)^4 + 90\times(-1)\times 6^3 + 2079\times(-1)\times 6^2 + 12\,636\times(-6) + 26\,244\right)$$

Result:

$$-\frac{4032}{\pi^2}$$

Decimal approximation:

-408.5270124459058944617219956616218400623745794784980849 45...

-408.52701244

Property:

$-\frac{4032}{\pi^2}$ is a transcendental number

Alternative representations:

$$\frac{-(-6)^4 + 90\,(-1)\,6^3 + 2079\,(-1)\,6^2 + 12\,636\,(-6) + 26\,244}{36\,\pi^2} = \frac{-49\,572 - (-6)^4 - 2079\times 6^2 - 90\times 6^3}{36\,(180\,°)^2}$$

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = \frac{-49572 - (-6)^4 - 2079 \times 6^2 - 90 \times 6^3}{216\zeta(2)}$$

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = \frac{-49572 - (-6)^4 - 2079 \times 6^2 - 90 \times 6^3}{36(-i\log(-1))^2}$$

Series representations:

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = -\frac{252}{\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = -\frac{252}{\left(\sum_{k=0}^{\infty} \frac{(-1)^k 1195^{-1-2k}\left(5^{1+2k} - 4 \times 239^{1+2k}\right)}{1+2k}\right)^2}$$

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = -\frac{4032}{\left(\sum_{k=0}^{\infty} \left(-\frac{1}{4}\right)^k \left(\frac{1}{1+2k} + \frac{2}{1+4k} + \frac{1}{3+4k}\right)\right)^2}$$

Integral representations:

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = -\frac{252}{\left(\int_0^1 \sqrt{1-t^2}\, dt\right)^2}$$

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = -\frac{1008}{\left(\int_0^{\infty} \frac{1}{1+t^2}\, dt\right)^2}$$

$$\frac{-(-6)^4 + 90(-1)6^3 + 2079(-1)6^2 + 12636(-6) + 26244}{36\pi^2} = -\frac{1008}{\left(\int_0^1 \frac{1}{\sqrt{1-t^2}}\, dt\right)^2}$$

1/(36Pi^2)*(-109.97^4+90*109.97^3+2079*109.97^2+12636*109.97+26244)

Input interpretation:

$$\frac{1}{36\pi^2}\left(-109.97^4+90\times 109.97^3+2079\times 109.97^2+12\,636\times 109.97+26\,244\right)$$

Result:

$$-0.909666\ldots$$

-0.909666…

Alternative representations:

$$\frac{-109.97^4+90\times 109.97^3+2079\times 109.97^2+12\,636\times 109.97+26\,244}{36\pi^2} = \frac{1.41582\times 10^6+2079\times 109.97^2+90\times 109.97^3-109.97^4}{36\,(180\,°)^2}$$

$$\frac{-109.97^4+90\times 109.97^3+2079\times 109.97^2+12\,636\times 109.97+26\,244}{36\pi^2} = \frac{1.41582\times 10^6+2079\times 109.97^2+90\times 109.97^3-109.97^4}{216\,\zeta(2)}$$

$$\frac{-109.97^4+90\times 109.97^3+2079\times 109.97^2+12\,636\times 109.97+26\,244}{36\pi^2} = \frac{1.41582\times 10^6+2079\times 109.97^2+90\times 109.97^3-109.97^4}{36\,(-i\log(-1))^2}$$

Series representations:

$$\frac{-109.97^4+90\times 109.97^3+2079\times 109.97^2+12\,636\times 109.97+26\,244}{36\pi^2} = -\frac{0.561128}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{-109.97^4+90\times 109.97^3+2079\times 109.97^2+12\,636\times 109.97+26\,244}{36\pi^2} = -\frac{2.24451}{\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^2}$$

$$\frac{-109.97^4 + 90 \times 109.97^3 + 2079 \times 109.97^2 + 12636 \times 109.97 + 26244}{36\pi^2} = -\frac{8.97804}{\left(\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)^2}$$

Integral representations:

$$\frac{-109.97^4 + 90 \times 109.97^3 + 2079 \times 109.97^2 + 12636 \times 109.97 + 26244}{36\pi^2} = -\frac{2.24451}{\left(\int_0^{\infty} \frac{1}{1+t^2}\, dt\right)^2}$$

$$\frac{-109.97^4 + 90 \times 109.97^3 + 2079 \times 109.97^2 + 12636 \times 109.97 + 26244}{36\pi^2} = -\frac{0.561128}{\left(\int_0^{1} \sqrt{1-t^2}\, dt\right)^2}$$

$$\frac{-109.97^4 + 90 \times 109.97^3 + 2079 \times 109.97^2 + 12636 \times 109.97 + 26244}{36\pi^2} = -\frac{2.24451}{\left(\int_0^{\infty} \frac{\sin(t)}{t}\, dt\right)^2}$$

Now from the following results 6876.61 -12143.4 and -0.909666, we obtain:

sqrt(144)-(6876.61 -12143.4 -0.909666)

where 144 is a Fibonacci number

Input interpretation:

$$\sqrt{144} - (6876.61 - 12143.4 - 0.909666)$$

Result:

5279.699666

5279.699666 result practically equal to the rest mass of B meson 5279.53

And:

(((sqrt(144)-(6876.61 -12143.4 -0.909666)))) /48 +29 +(sqrt5-1)/2

Input interpretation:

$$\frac{1}{48}\left(\sqrt{144} - (6876.61 - 12143.4 - 0.909666)\right) + 29 + \frac{1}{2}\left(\sqrt{5} - 1\right)$$

Result:

139.612...

139.612...

Or:

5279.699666 /48 +29 +(sqrt5-1)/2

Input interpretation:

$$\frac{5279.699666}{48} + 29 + \frac{1}{2}\left(\sqrt{5} - 1\right)$$

Result:

139.6117770...

139.611777... result practically equal to the rest mass of Pion meson 139.57

From:

INTEGRALS ASSOCIATED WITH RAMANUJAN AND ELLIPTIC FUNCTIONS

BRUCE C. BERNDT

From:

$$\int_{-\infty}^{\infty} \frac{dx}{\cos\sqrt{x} + \cosh\sqrt{x}} = 2\pi^2 \cdot \frac{1}{2}\left(\frac{\sqrt{\pi}}{\Gamma^2(\frac{3}{4})}\right)^2 \sqrt{\tfrac{1}{2} \cdot \tfrac{1}{2}}$$

$$= \frac{\pi^3}{2\Gamma^4(\frac{3}{4})} = \frac{\pi^3}{2\Gamma^2(\frac{3}{4})} \cdot \frac{\Gamma^2(\frac{1}{4})}{2\pi^2} = \frac{\pi}{4}\frac{\Gamma^2(\frac{1}{4})}{\Gamma^2(\frac{3}{4})}, \qquad (2.14)$$

We obtain:

Pi/4 (gamma^2 (1/4))/(gamma^2 (3/4))

Input:

$$\frac{\pi}{4} \times \frac{\Gamma\left(\frac{1}{4}\right)^2}{\Gamma\left(\frac{3}{4}\right)^2}$$

$\Gamma(x)$ is the gamma function

Exact result:

$$\frac{\pi\,\Gamma\left(\frac{1}{4}\right)^2}{4\,\Gamma\left(\frac{3}{4}\right)^2}$$

Decimal approximation:

6.875185818020372827490095779810557197900856451819160896274...

6.87518581802…..

Alternate forms:

$$\frac{\Gamma\left(\frac{1}{4}\right)^4}{8\pi}$$

$$\frac{4\pi\,\Gamma\left(\frac{5}{4}\right)^2}{\Gamma\left(\frac{3}{4}\right)^2}$$

$$\frac{9\pi\left(\frac{1}{4}!\right)^2}{4\left(\frac{3}{4}!\right)^2}$$

$n!$ is the factorial function

Alternative representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^2\pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi\left(\left(-1+\frac{1}{4}\right)!\right)^2}{4\left(\left(-1+\frac{3}{4}\right)!\right)^2}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2\pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi\,\Gamma\left(\frac{1}{4},0\right)^2}{4\,\Gamma\left(\frac{3}{4},0\right)^2}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi \left(\frac{G\left(1+\frac{1}{4}\right)}{G\left(\frac{1}{4}\right)}\right)^2}{4 \left(\frac{G\left(1+\frac{3}{4}\right)}{G\left(\frac{3}{4}\right)}\right)^2}$$

Series representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi \left(\sum_{k=1}^{\infty} \left(\frac{3}{4}\right)^k c_k\right)^2}{4 \left(\sum_{k=1}^{\infty} 4^{-k} c_k\right)^2}$$

$$\text{for } \left(c_1 = 1 \text{ and } c_2 = 1 \text{ and } c_k = \frac{\gamma\, c_{-1+k} + \sum_{j=1}^{-2+k} (-1)^{1+j+k} c_j\, \zeta(-j+k)}{-1+k}\right)$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{9 \pi \left(\sum_{k=0}^{\infty} \frac{4^{-k}\, \Gamma^{(k)}(1)}{k!}\right)^2}{4 \left(\sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}\right)^k \Gamma^{(k)}(1)}{k!}\right)^2}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi \left(\sum_{k=0}^{\infty} \frac{\left(\frac{1}{4}-z_0\right)^k \Gamma^{(k)}(z_0)}{k!}\right)^2}{4 \left(\sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}-z_0\right)^k \Gamma^{(k)}(z_0)}{k!}\right)^2} \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi \left(\sum_{k=0}^{\infty} \left(\frac{3}{4} - z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\pi + \pi z_0\right) \Gamma^{(j)}(1-z_0)}{j!(-j+k)!}\right)^2}{4 \left(\sum_{k=0}^{\infty} \left(\frac{1}{4} - z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\pi + \pi z_0\right) \Gamma^{(j)}(1-z_0)}{j!(-j+k)!}\right)^2}$$

Integral representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{1}{4} \exp\left(\gamma + \int_0^1 \frac{2 \sqrt[4]{x} - 2 x^{3/4} + \log(x)}{(-1+x)\log(x)}\, dx\right) \pi$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{1}{4}\, e^{\int_0^1 \frac{\left(-1+\sqrt[4]{x}\right)^2}{\left(1+\sqrt{x}\right)\log(x)}\, dx}\, \pi$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^2 \pi}{\Gamma\left(\frac{3}{4}\right)^2 4} = \frac{\pi \left(\int_0^1 \frac{1}{\log^{3/4}\left(\frac{1}{t}\right)} \, dt\right)^2}{4 \left(\int_0^1 \frac{1}{\sqrt[4]{\log\left(\frac{1}{t}\right)}} \, dt\right)^2}$$

Now:

Corollary 3.3. *If r is any non-negative integer, then*

$$\int_0^\infty \frac{x^{4r+1}dx}{\cos x + \cosh x} = \frac{(-1)^r \pi^{4r+2}}{2^{2r+1}} \sum_{m=0}^{\infty} \frac{(-1)^m (2m+1)^{4r+1}}{\cosh\{\frac{1}{2}(2m+1)\pi\}}. \qquad (3.6)$$

Proof. Let a be even, say, $a = 2r$, in (3.1). The evaluation (3.6) follows immediately. □

Let $r = 1$ in (3.6). We use Entry 16(iii) in Chapter 17 of Ramanujan's second notebook [15], [3, p. 134]. In the notation (2.11),

$$\sum_{m=0}^{\infty} \frac{(-1)^m (2m+1)^5}{\cosh\{\frac{1}{2}(2m+1)y\}} = \tfrac{1}{2} z^6 \{1 - 16x(1-x)\} \sqrt{x(1-x)}. \qquad (3.7)$$

Using also (2.13), we see that (3.6) and (3.7) yield

$$\int_0^\infty \frac{x^5 dx}{\cos x + \cosh x} = -\frac{\pi^6}{16} \left(\frac{\sqrt{\pi}}{\Gamma^2(\frac{3}{4})}\right)^6 \left\{1 - \frac{16}{4}\right\} \frac{1}{2}$$
$$= \frac{3\pi^9}{32\Gamma^{12}(\frac{3}{4})} = \frac{3\pi^3}{256} \frac{\Gamma^6(\frac{1}{4})}{\Gamma^6(\frac{3}{4})},$$

(((3Pi^3 / 256)) ((((gamma^6 (1/4)/ (gamma^6 (3/4))))))

Input:

$$\left(3 \times \frac{\pi^3}{256}\right) \times \frac{\Gamma\left(\frac{1}{4}\right)^6}{\Gamma\left(\frac{3}{4}\right)^6}$$

$\Gamma(x)$ is the gamma function

Exact result:

$$\frac{3\pi^3\,\Gamma\left(\frac{1}{4}\right)^6}{256\,\Gamma\left(\frac{3}{4}\right)^6}$$

Decimal approximation:

243.7331407513206852001947251977716653431983226563734391776...

243.73314075132….

Alternate forms:

$$\frac{3\,\Gamma\left(\frac{1}{4}\right)^{12}}{2048\,\pi^3}$$

$$\frac{48\,\pi^3\,\Gamma\left(\frac{5}{4}\right)^6}{\Gamma\left(\frac{3}{4}\right)^6}$$

$$\frac{2187\,\pi^3\left(\frac{1}{4}!\right)^6}{256\left(\frac{3}{4}!\right)^6}$$

$n!$ is the factorial function

Alternative representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^6\,3\,\pi^3}{\Gamma\left(\frac{3}{4}\right)^6\,256}=\frac{3\,\pi^3\left(\left(-1+\frac{1}{4}\right)!\right)^6}{256\left(\left(-1+\frac{3}{4}\right)!\right)^6}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6\,3\,\pi^3}{\Gamma\left(\frac{3}{4}\right)^6\,256}=\frac{3\,\pi^3\,\Gamma\left(\frac{1}{4},0\right)^6}{256\,\Gamma\left(\frac{3}{4},0\right)^6}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6\,3\,\pi^3}{\Gamma\left(\frac{3}{4}\right)^6\,256}=\frac{3\,\pi^3\left(\frac{G\left(1+\frac{1}{4}\right)}{G\left(\frac{1}{4}\right)}\right)^6}{256\left(\frac{G\left(1+\frac{3}{4}\right)}{G\left(\frac{3}{4}\right)}\right)^6}$$

Series representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{3\pi^3 \left(\sum_{k=1}^{\infty} \left(\frac{3}{4}\right)^k c_k\right)^6}{256 \left(\sum_{k=1}^{\infty} 4^{-k} c_k\right)^6}$$

$$\text{for } \left(c_1 = 1 \text{ and } c_2 = 1 \text{ and } c_k = \frac{\gamma c_{-1+k} + \sum_{j=1}^{-2+k} (-1)^{1+j+k} c_j \zeta(-j+k)}{-1+k}\right)$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{2187\pi^3 \left(\sum_{k=0}^{\infty} \frac{4^{-k} \Gamma^{(k)}(1)}{k!}\right)^6}{256 \left(\sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}\right)^k \Gamma^{(k)}(1)}{k!}\right)^6}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{3\pi^3 \left(\sum_{k=0}^{\infty} \frac{\left(\frac{1}{4}-z_0\right)^k \Gamma^{(k)}(z_0)}{k!}\right)^6}{256 \left(\sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}-z_0\right)^k \Gamma^{(k)}(z_0)}{k!}\right)^6} \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{3\pi^3 \left(\sum_{k=0}^{\infty} \left(\frac{3}{4}-z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\pi + \pi z_0\right) \Gamma^{(j)}(1-z_0)}{j!(-j+k)!}\right)^6}{256 \left(\sum_{k=0}^{\infty} \left(\frac{1}{4}-z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\pi + \pi z_0\right) \Gamma^{(j)}(1-z_0)}{j!(-j+k)!}\right)^6}$$

Integral representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{3}{256} \exp\left(3\left(\gamma + \int_0^1 \frac{2\sqrt[4]{x} - 2x^{3/4} + \log(x)}{(-1+x)\log(x)} dx\right)\right) \pi^3$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{3}{256} \exp\left(\int_0^1 \frac{3\left(-1+\sqrt[4]{x}\right)^2}{\left(1+\sqrt{x}\right)\log(x)} dx\right) \pi^3$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^6 3\pi^3}{\Gamma\left(\frac{3}{4}\right)^6 256} = \frac{3\pi^3 \left(\int_0^1 \frac{1}{\log^{3/4}\left(\frac{1}{t}\right)} dt\right)^6}{256\left(\int_0^1 \frac{1}{\sqrt[4]{\log\left(\frac{1}{t}\right)}} dt\right)^6}$$

Now:

Again, we set $x = \frac{1}{2}$, which implies that $y = \pi$. Hence, (3.6) and (3.8) give us

$$\int_0^\infty \frac{x^9 dx}{\cos x + \cosh x} = \frac{\pi^{10}}{2^6}\left(\frac{\sqrt{\pi}}{\Gamma^2(\frac{3}{4})}\right)^{10}\left\{1 - \frac{1232}{4} + \frac{7936}{16}\right\}\frac{1}{2}$$
$$= \frac{189\pi^{15}}{2^7\Gamma^{20}(\frac{3}{4})} = \frac{189\pi^{15}}{2^7\Gamma^{10}(\frac{3}{4})} \cdot \frac{\Gamma^{10}(\frac{1}{4})}{(\pi\sqrt{2})^{10}} = \frac{3^3 \cdot 7\pi^5}{2^{12}}\frac{\Gamma^{10}(\frac{1}{4})}{\Gamma^{10}(\frac{3}{4})}.$$

(((3^3*7*Pi^5)/(2^12))) ((((gamma^10 (1/4)/ (gamma^10 (3/4))))))

Input:

$$\frac{3^3 \times 7\pi^5}{2^{12}} \times \frac{\Gamma\left(\frac{1}{4}\right)^{10}}{\Gamma\left(\frac{3}{4}\right)^{10}}$$

$\Gamma(x)$ is the gamma function

Exact result:

$$\frac{189\pi^5 \Gamma\left(\frac{1}{4}\right)^{10}}{4096\,\Gamma\left(\frac{3}{4}\right)^{10}}$$

Decimal approximation:

725811.7845430244874980537425854957142684872912626410861573...

725811.784543024….

Alternate forms:

$$\frac{189\,\Gamma\left(\frac{1}{4}\right)^{20}}{131\,072\,\pi^5}$$

$$\frac{48\,384\,\pi^5\,\Gamma\left(\frac{5}{4}\right)^{10}}{\Gamma\left(\frac{3}{4}\right)^{10}}$$

$$\frac{11\,160\,261\,\pi^5\,\left(\frac{1}{4}!\right)^{10}}{4096\,\left(\frac{3}{4}!\right)^{10}}$$

$n!$ is the factorial function

Alternative representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\,(3^3\times 7\,\pi^5)}{\Gamma\left(\frac{3}{4}\right)^{10}\,2^{12}} = \frac{189\,\pi^5\,\left(\left(-1+\frac{1}{4}\right)!\right)^{10}}{2^{12}\,\left(\left(-1+\frac{3}{4}\right)!\right)^{10}}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\,(3^3\times 7\,\pi^5)}{\Gamma\left(\frac{3}{4}\right)^{10}\,2^{12}} = \frac{189\,\pi^5\,\Gamma\left(\frac{1}{4},0\right)^{10}}{2^{12}\,\Gamma\left(\frac{3}{4},0\right)^{10}}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\,(3^3\times 7\,\pi^5)}{\Gamma\left(\frac{3}{4}\right)^{10}\,2^{12}} = \frac{189\,\pi^5\,\left(\frac{G\left(1+\frac{1}{4}\right)}{G\left(\frac{1}{4}\right)}\right)^{10}}{2^{12}\,\left(\frac{G\left(1+\frac{3}{4}\right)}{G\left(\frac{3}{4}\right)}\right)^{10}}$$

Series representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\,(3^3\times 7\,\pi^5)}{\Gamma\left(\frac{3}{4}\right)^{10}\,2^{12}} = \frac{189\,\pi^5\,\left(\sum_{k=1}^{\infty}\left(\frac{3}{4}\right)^k c_k\right)^{10}}{4096\,\left(\sum_{k=1}^{\infty} 4^{-k}\,c_k\right)^{10}}$$

$$\text{for}\left(c_1 = 1 \text{ and } c_2 = 1 \text{ and } c_k = \frac{\gamma\,c_{-1+k} + \sum_{j=1}^{-2+k}(-1)^{1+j+k}\,c_j\,\zeta(-j+k)}{-1+k}\right)$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\left(3^3 \times 7\pi^5\right)}{\Gamma\left(\frac{3}{4}\right)^{10} 2^{12}} = \frac{11\,160\,261\,\pi^5 \left(\sum_{k=0}^{\infty} \frac{4^{-k}\,\Gamma^{(k)}(1)}{k!}\right)^{10}}{4096\left(\sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}\right)^k \Gamma^{(k)}(1)}{k!}\right)^{10}}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\left(3^3 \times 7\pi^5\right)}{\Gamma\left(\frac{3}{4}\right)^{10} 2^{12}} = \frac{189\,\pi^5 \left(\sum_{k=0}^{\infty} \frac{\left(\frac{1}{4}-z_0\right)^k \Gamma^{(k)}(z_0)}{k!}\right)^{10}}{4096\left(\sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}-z_0\right)^k \Gamma^{(k)}(z_0)}{k!}\right)^{10}} \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\left(3^3 \times 7\pi^5\right)}{\Gamma\left(\frac{3}{4}\right)^{10} 2^{12}} = \frac{189\,\pi^5 \left(\sum_{k=0}^{\infty} \left(\frac{3}{4}-z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\pi + \pi z_0\right) \Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^{10}}{4096\left(\sum_{k=0}^{\infty} \left(\frac{1}{4}-z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\pi + \pi z_0\right) \Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^{10}}$$

Integral representations:

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\left(3^3 \times 7\pi^5\right)}{\Gamma\left(\frac{3}{4}\right)^{10} 2^{12}} = \frac{189 \exp\left(5\gamma + \int_0^1 \frac{5\left(2\sqrt[4]{x} - 2x^{3/4} + \log(x)\right)}{(-1+x)\log(x)}\,dx\right)\pi^5}{4096}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\left(3^3 \times 7\pi^5\right)}{\Gamma\left(\frac{3}{4}\right)^{10} 2^{12}} = \frac{189 \exp\left(10\int_0^1 \frac{\left(-1+\sqrt[4]{x}\right)^2}{2\left(1+\sqrt{x}\right)\log(x)}\,dx\right)\pi^5}{4096}$$

$$\frac{\Gamma\left(\frac{1}{4}\right)^{10}\left(3^3 \times 7\pi^5\right)}{\Gamma\left(\frac{3}{4}\right)^{10} 2^{12}} = \frac{189\,\pi^5 \left(\int_0^1 \frac{1}{\log^{3/4}\left(\frac{1}{t}\right)}\,dt\right)^{10}}{4096\left(\int_0^1 \frac{1}{\sqrt[4]{\log\left(\frac{1}{t}\right)}}\,dt\right)^{10}}$$

From the ratio of the two results, we obtain:

(725811.7845430244 / 243.7331407513)

Input interpretation:

$$\frac{725811.7845430244}{243.7331407513}$$

Result:

2977.8953420356855433306669266095744634407397599562054562 8...

2977.8953420

And multiplying by $1/\pi$ this result, divided by the previous obtained value, we obtain:

1/Pi(2977.8953420356 / 6.8751858180)

Input interpretation:

$$\frac{1}{\pi} \times \frac{2977.8953420356}{6.8751858180}$$

Result:

137.87169576...

137.87169576 result very near to the rest mass of Pion meson 139.57

Alternative representations:

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{2977.89534203560000}{6.87518581800000\,(180\,°)}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{2977.89534203560000}{6.87518581800000\,(-i\log(-1))}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{2977.89534203560000}{6.87518581800000\cos^{-1}(-1)}$$

Series representations:

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{108.284176634148}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{216.568353268296}{-1.00000000000000 + \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{433.136706536591}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{216.568353268296}{\int_0^{\infty} \frac{1}{1+t^2}\,dt}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{108.284176634148}{\int_0^{1} \sqrt{1-t^2}\,dt}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} = \frac{216.568353268296}{\int_0^{\infty} \frac{\sin(t)}{t}\,dt}$$

Or:

golden ratio+1/Pi(2977.8953420356 / 6.8751858180)

Input interpretation:

$$\phi + \frac{1}{\pi} \times \frac{2977.8953420356}{6.8751858180}$$

ϕ is the golden ratio

Result:

139.48972975...

139.48972975…. result very near to the rest mass of Pion meson 139.57

Alternative representations:

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = -2\cos(216\,°) + \frac{2977.89534203560000}{6.87518581800000\,\pi}$$

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = 2\cos\left(\frac{\pi}{5}\right) + \frac{2977.89534203560000}{6.87518581800000\,\pi}$$

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = -2\cos(216\,°) + \frac{2977.89534203560000}{6.87518581800000\,(180\,°)}$$

Series representations:

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = \phi + \frac{108.284176634148}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = \phi + \frac{216.568353268296}{-1.00000000000000 + \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = \phi + \frac{433.136706536591}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = \phi + \frac{216.568353268296}{\int_0^{\infty} \frac{1}{1+t^2}\,dt}$$

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = \phi + \frac{108.284176634148}{\int_0^{1} \sqrt{1-t^2}\,dt}$$

$$\phi + \frac{2977.89534203560000}{6.87518581800000\,\pi} = \phi + \frac{216.568353268296}{\int_0^{\infty} \frac{\sin(t)}{t}\,dt}$$

And:

1/Pi(2977.8953420356 / 6.8751858180) – 13

Input interpretation:

$$\frac{1}{\pi} \times \frac{2977.8953420356}{6.8751858180} - 13$$

Result:

124.87169576...

124.87169576…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representations:

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{2977.89534203560000}{6.87518581800000\,(180\,°)}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{2977.89534203560000}{6.87518581800000\,(-i\log(-1))}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{2977.89534203560000}{6.87518581800000\cos^{-1}(-1)}$$

Series representations:

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{108.284176634148}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{216.568353268296}{-1.00000000000000 + \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{433.136706536591}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{216.568353268296}{\int_0^\infty \frac{1}{1+t^2}\,dt}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{108.284176634148}{\int_0^1 \sqrt{1-t^2}\,dt}$$

$$\frac{2977.89534203560000}{6.87518581800000\,\pi} - 13 = -13 + \frac{216.568353268296}{\int_0^\infty \frac{\sin(t)}{t}\,dt}$$

We note that from the result of previous expression,

$$\frac{725\,811.7845430244}{243.7331407513}$$

we obtain also:

1/2(725811.7845430244 / 243.7331407513)+199+47-7

where 7, 47 and 199 are Lucas numbers

Input interpretation:

$$\frac{1}{2} \times \frac{725\,811.7845430244}{243.7331407513} + 199 + 47 - 7$$

Result:

1727.9476710178427716653333463304787231720369879978102728 14...

1727.9476710...

This result is very near to the mass of candidate glueball $f_0(1710)$ meson. Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. As a consequence, it is sometimes called a Zagier as a pun on the Gross–Zagier theorem. The number 1728 is one less than the Hardy–Ramanujan number 1729

And:

2sqrt(725811.7845430244 / 243.7331407513)+11+5

Where 5 is a Fibonacci number and 11 is a Lucas number

Input interpretation:

$$2\sqrt{\frac{725811.7845430244}{243.7331407513}}+11+5$$

Result:

125.1401913510...

125.1401913510... result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

We obtain also:

(((1/sqrt(725811.7845430244 / 243.7331407513))))^1/1024

Input interpretation:

$$\sqrt[1024]{\frac{1}{\sqrt{\frac{725811.7845430244}{243.7331407513}}}}$$

Result:

0.9961018694329181...

0.9961018694329181.... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

(754+1.7168646644)*10^3 * (((3^3*7*Pi^5)/(2^12))) ((((gamma^10 (1/4)/(gamma^10 (3/4))))))

Input interpretation:

$$(754 + 1.7168646644)\times 10^3 \times \frac{3^3\times 7\pi^5}{2^{12}} \times \frac{\Gamma\left(\frac{1}{4}\right)^{10}}{\Gamma\left(\frac{3}{4}\right)^{10}}$$

$\Gamma(x)$ is the gamma function

Result:

$5.4850820615133\ldots \times 10^{11}$

5.4850820615133 * 10^{11}

Alternative representations:

$$\frac{\left((754 + 1.71686466440000)\, 10^3\, \Gamma\left(\frac{1}{4}\right)^{10}\right) 3^3\, (7\pi^5)}{2^{12}\, \Gamma\left(\frac{3}{4}\right)^{10}} = \frac{142\,830.487421571600 \times 10^3\, \pi^5 \left(\left(-1+\frac{1}{4}\right)!\right)^{10}}{2^{12}\left(\left(-1+\frac{3}{4}\right)!\right)^{10}}$$

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{142\,830.487421571600\times10^3\,\pi^5\,\Gamma\left(\frac{1}{4},0\right)^{10}}{2^{12}\,\Gamma\left(\frac{3}{4},0\right)^{10}}$$

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{142\,830.487421571600\times10^3\,\pi^5\left(\frac{G\left(1+\frac{1}{4}\right)}{G\left(\frac{1}{4}\right)}\right)^{10}}{2^{12}\left(\frac{G\left(1+\frac{3}{4}\right)}{G\left(\frac{3}{4}\right)}\right)^{10}}$$

Series representations:

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{2.05908140912021030\times10^9\,\pi^5\left(\sum_{k=0}^{\infty}\frac{4^{-k}\,\Gamma^{(k)}(1)}{k!}\right)^{10}}{\left(\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}\right)^k\Gamma^{(k)}(1)}{k!}\right)^{10}}$$

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\left(\sum_{k=0}^{\infty}\frac{\left(\frac{1}{4}-z_0\right)^k\Gamma^{(k)}(z_0)}{k!}\right)^{10}}{\left(\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}-z_0\right)^k\Gamma^{(k)}(z_0)}{k!}\right)^{10}} \quad \text{for } (z_0\notin\mathbb{Z} \text{ or } z_0>0)$$

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\left(\sum_{k=0}^{\infty}\left(\frac{3}{4}-z_0\right)^k\sum_{j=0}^{k}\frac{(-1)^j\,\pi^{-j+k}\sin\left(\frac{1}{2}\pi(-j+k+2z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^{10}}{\left(\sum_{k=0}^{\infty}\left(\frac{1}{4}-z_0\right)^k\sum_{j=0}^{k}\frac{(-1)^j\,\pi^{-j+k}\sin\left(\frac{1}{2}\pi(-j+k+2z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^{10}}$$

Integral representations:

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34870.7244681571289\,\pi^5\left(\int_0^1 \frac{1}{\log^{3/4}\left(\frac{1}{t}\right)}\,dt\right)^{10}}{\left(\int_0^1 \frac{1}{\sqrt[4]{\log\left(\frac{1}{t}\right)}}\,dt\right)^{10}}$$

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34870.7244681571289\,\pi^5\left(\int_0^\infty \frac{e^{-t}}{t^{3/4}}\,dt\right)^{10}}{\left(\int_0^\infty \frac{e^{-t}}{\sqrt[4]{t}}\,dt\right)^{10}}$$

$$\frac{\left((754+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34870.7244681571289\,\pi^5\,\csc^{10}\left(\frac{\pi}{8}\right)\left(\int_0^\infty \frac{\sin(t)}{t^{3/4}}\,dt\right)^{10}}{\csc^{10}\left(\frac{3\pi}{8}\right)\left(\int_0^\infty \frac{\sin(t)}{\sqrt[4]{t}}\,dt\right)^{10}}$$

Or:

(775-21+1.7168646644)*10^3 * (((3^3*7*Pi^5)/(2^12))) ((((gamma^10 (1/4)/ (gamma^10 (3/4))))))

Where 775 is very near to the rest mass of Charged rho meson 775.11 and 1.7168646644 is a Ramanujan mock theta function

Input interpretation:

$$(775-21+1.7168646644)\times 10^3\times\frac{3^3\times 7\,\pi^5}{2^{12}}\times\frac{\Gamma\left(\frac{1}{4}\right)^{10}}{\Gamma\left(\frac{3}{4}\right)^{10}}$$

$\Gamma(x)$ is the gamma function

Result:

$5.4850820615133\ldots \times 10^{11}$

5.485082….*10^11

The two results are very near to the value 5.48515304…*10^11 that is the generalized black hole entropy (see previous analyzed formula (19))

Alternative representations:

$$\frac{((775-21+1.71686466440000)\,10^3\,\Gamma(\frac{1}{4})^{10})\,3^3\,(7\pi^5)}{2^{12}\,\Gamma(\frac{3}{4})^{10}} = \frac{142830.487421571600 \times 10^3\,\pi^5\,((-1+\frac{1}{4})!)^{10}}{2^{12}\,((-1+\frac{3}{4})!)^{10}}$$

$$\frac{((775-21+1.71686466440000)\,10^3\,\Gamma(\frac{1}{4})^{10})\,3^3\,(7\pi^5)}{2^{12}\,\Gamma(\frac{3}{4})^{10}} = \frac{142830.487421571600 \times 10^3\,\pi^5\,\Gamma(\frac{1}{4},0)^{10}}{2^{12}\,\Gamma(\frac{3}{4},0)^{10}}$$

$$\frac{((775-21+1.71686466440000)\,10^3\,\Gamma(\frac{1}{4})^{10})\,3^3\,(7\pi^5)}{2^{12}\,\Gamma(\frac{3}{4})^{10}} = \frac{142830.487421571600 \times 10^3\,\pi^5\left(\frac{G(1+\frac{1}{4})}{G(\frac{1}{4})}\right)^{10}}{2^{12}\left(\frac{G(1+\frac{3}{4})}{G(\frac{3}{4})}\right)^{10}}$$

Series representations:

$$\frac{((775-21+1.71686466440000)\,10^3\,\Gamma(\frac{1}{4})^{10})\,3^3\,(7\pi^5)}{2^{12}\,\Gamma(\frac{3}{4})^{10}} = \frac{2.05908140912021030 \times 10^9\,\pi^5\left(\sum_{k=0}^{\infty}\frac{4^{-k}\,\Gamma^{(k)}(1)}{k!}\right)^{10}}{\left(\sum_{k=0}^{\infty}\frac{(\frac{3}{4})^k\,\Gamma^{(k)}(1)}{k!}\right)^{10}}$$

$$\frac{\left((775-21+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\left(\sum_{k=0}^{\infty}\frac{\left(\frac{1}{4}-z_0\right)^k\Gamma^{(k)}(z_0)}{k!}\right)^{10}}{\left(\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}-z_0\right)^k\Gamma^{(k)}(z_0)}{k!}\right)^{10}} \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{\left((775-21+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\left(\sum_{k=0}^{\infty}\left(\frac{3}{4}-z_0\right)^k\sum_{j=0}^{k}\frac{(-1)^j\,\pi^{-j+k}\sin\left(\frac{1}{2}\pi(-j+k+2z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^{10}}{\left(\sum_{k=0}^{\infty}\left(\frac{1}{4}-z_0\right)^k\sum_{j=0}^{k}\frac{(-1)^j\,\pi^{-j+k}\sin\left(\frac{1}{2}\pi(-j+k+2z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^{10}}$$

Integral representations:

$$\frac{\left((775-21+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\left(\int_0^1\frac{1}{\log^{3/4}\left(\frac{1}{t}\right)}\,dt\right)^{10}}{\left(\int_0^1\frac{1}{\sqrt[4]{\log\left(\frac{1}{t}\right)}}\,dt\right)^{10}}$$

$$\frac{\left((775-21+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\left(\int_0^\infty\frac{e^{-t}}{t^{3/4}}\,dt\right)^{10}}{\left(\int_0^\infty\frac{e^{-t}}{\sqrt[4]{t}}\,dt\right)^{10}}$$

$$\frac{\left((775-21+1.71686466440000)\,10^3\,\Gamma\left(\frac{1}{4}\right)^{10}\right)3^3\,(7\,\pi^5)}{2^{12}\,\Gamma\left(\frac{3}{4}\right)^{10}} = \frac{34\,870.7244681571289\,\pi^5\,\csc^{10}\left(\frac{\pi}{8}\right)\left(\int_0^\infty\frac{\sin(t)}{t^{3/4}}\,dt\right)^{10}}{\csc^{10}\left(\frac{3\pi}{8}\right)\left(\int_0^\infty\frac{\sin(t)}{\sqrt[4]{t}}\,dt\right)^{10}}$$

From:

Anomalies in the Space of Coupling Constants and Their Dynamical Applications I
Clay Cordova, Daniel S. Freed, Ho Tat Lam, and Nathan Seiberg

arXiv:1905.09315v3 [hep-th] 30 Oct 2019

[24] As usual, it is convenient to define this term by an extension to a spin four-manifold Y. Then for any integer k we have

$$\exp\left(ik\int_X CS_{\text{grav}}\right) = \exp\left(2\pi ik\int_Y \frac{p_1(Y)}{48}\right) = \exp\left(\frac{ik}{192\pi}\int_Y \text{Tr}(R\wedge R)\right) , \qquad (3.14)$$

where $p_1(Y)$ is the Pontrjagin class and we have used $\int_Y p_1(Y) \in 48\mathbb{Z}$ for any closed spin manifold Y. Although this term is called a gravitational 'Chern-Simons term' in the physics literature, it is not covered by the work of Chern-Simons [56]. Rather, it is an exponentiated η-invariant; see Remark 6.25.

In particular we can use this to recover the T anomaly of the theory at $m = 0$: using $\rho(0) = 1/2$, the anomaly becomes a familiar gravitational θ_g-angle at the non-trivial T-invariant value of $\theta_g = \pi$.

$$\tilde{Z}[m,g] = Z[m,g]\exp\left(-i\int_Y \rho(m)dCS_{\text{grav}}\right) = Z[m,g]\exp\left(-\frac{i}{192\pi}\int_Y \rho(m)\text{Tr}(R\wedge R)\right) , \qquad (3.15)$$

where we have considered ρ(m) = 1/2 and Tr(R∧ R) = -5 .

We obtain:

exp((((-i/(192Pi)) integrate [1/2*(-5)]x)))

Input:

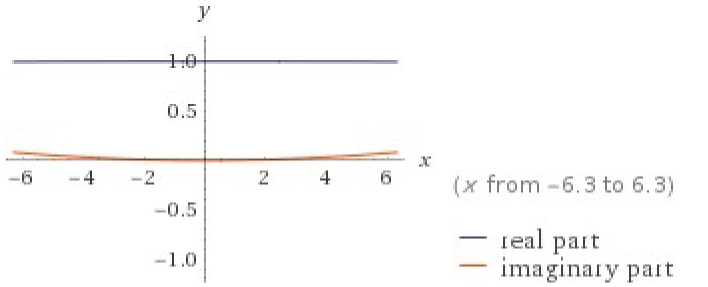
$$\exp\left(-\frac{i}{192\pi}\int\left(\frac{1}{2}\times(-5)\right)x\,dx\right)$$

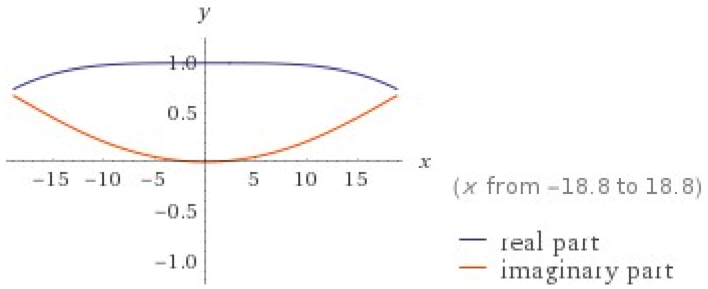
i is the imaginary unit

Exact result:

$$e^{(5 i x^2)/(768\pi)}$$

Plots:





Alternate form assuming x is real:

$$\cos\left(\frac{5x^2}{768\pi}\right)+i\sin\left(\frac{5x^2}{768\pi}\right)$$

Series expansion of the integral at x = 0:

$$1+\frac{5ix^2}{768\pi}-\frac{25x^4}{1179648\pi^2}+O(x^5)$$

(Taylor series)

Indefinite integral:

$$\exp\left(-\frac{i\int -\frac{5x}{2}\,dx}{192\pi}\right)=e^{\frac{5ix^2}{768\pi}+\text{constant}}$$

From

$$\cos\left(\frac{5x^2}{768\pi}\right)+i\sin\left(\frac{5x^2}{768\pi}\right)$$

For x = 10 and changing the sign, we obtain:

cos((5 * 10^2)/(768 π)) - sin((5 * 10^2)/(768 π))

Input:

$$\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)$$

Exact result:

$$\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)$$

Decimal approximation:

0.77285108614592273255899106598629289544113224243440211343 1...

0.7728510861459….

Alternate forms:

$$\left(\frac{1}{2}-\frac{i}{2}\right)e^{-(125 i)/(192 \pi)}+\left(\frac{1}{2}+\frac{i}{2}\right)e^{(125 i)/(192 \pi)}$$

$$\left(\cos\left(\frac{1}{192 \pi}\right)-\sin\left(\frac{1}{192 \pi}\right)\right)\left(-1-2 \sin\left(\frac{1}{96 \pi}\right)+2 \cos\left(\frac{1}{48 \pi}\right)\right)\left(-1-2 \sin\left(\frac{5}{96 \pi}\right)+2 \cos\left(\frac{5}{48 \pi}\right)\right)\left(-1-2 \sin\left(\frac{25}{96 \pi}\right)+2 \cos\left(\frac{25}{48 \pi}\right)\right)$$

Alternative representations:

$$\cos\left(\frac{5\times 10^2}{768 \pi}\right)-\sin\left(\frac{5\times 10^2}{768 \pi}\right)=\cosh\left(-\frac{5 i\, 10^2}{768 \pi}\right)+\cos\left(\frac{\pi}{2}+\frac{5\times 10^2}{768 \pi}\right)$$

$$\cos\left(\frac{5\times 10^2}{768 \pi}\right)-\sin\left(\frac{5\times 10^2}{768 \pi}\right)=\cosh\left(-\frac{5 i\, 10^2}{768 \pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768 \pi}\right)$$

$$\cos\left(\frac{5\times 10^2}{768 \pi}\right)-\sin\left(\frac{5\times 10^2}{768 \pi}\right)=\cosh\left(\frac{5 i\, 10^2}{768 \pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768 \pi}\right)$$

Series representations:

$$\cos\left(\frac{5\times 10^2}{768 \pi}\right)-\sin\left(\frac{5\times 10^2}{768 \pi}\right)=\sum_{k=0}^{\infty}\frac{(192 \pi)^{-2 k}\left((-15\,625)^k+(-1)^{1+k}\left(125-96 \pi^2\right)^{2 k}\right)}{(2 k)!}$$

$$\cos\left(\frac{5\times 10^2}{768 \pi}\right)-\sin\left(\frac{5\times 10^2}{768 \pi}\right)=\sum_{k=0}^{\infty}\left(\frac{(-15\,625)^k (192 \pi)^{-2 k}}{(2 k)!}-\frac{e^{i k \pi}\left(\frac{192 \pi}{125}\right)^{-1-2 k}}{(1+2 k)!}\right)$$

$$\cos\left(\frac{5\times 10^2}{768 \pi}\right)-\sin\left(\frac{5\times 10^2}{768 \pi}\right)=\sum_{k=0}^{\infty}\left(\frac{(-1)^{1+k}\left(\frac{125}{192 \pi}-\frac{\pi}{2}\right)^{1+2 k}}{(1+2 k)!}-\frac{e^{i k \pi}\left(\frac{192 \pi}{125}\right)^{-1-2 k}}{(1+2 k)!}\right)$$

Integral representations:

$$\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)=\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}-\frac{i\,e^{-15\,625/(147\,456\,\pi^2\,s)+s}\,(-125+384\,\pi\,s)}{768\,\pi^{3/2}\,s^{3/2}}\,d\,s\quad\text{for }\gamma>0$$

$$\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)=-\frac{-125\,i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-15625/(147456\,\pi^2\,s)+s}}{s^{3/2}}\,d\,s+768\,\pi^{3/2}\int_{\frac{\pi}{2}}^{\frac{125}{192\,\pi}}\sin(t)\,d\,t}{768\,\pi^{3/2}}\quad\text{for }\gamma>0$$

$$\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)=-\frac{i\left(96\,\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-15\,625/(147456\,\pi^2\,s)+s}}{\sqrt{s}}\,d\,s-125\,i\int_0^1\cos\left(\frac{125\,t}{192\,\pi}\right)d\,t\right)}{192\,\pi}\quad\text{for }\gamma>0$$

Multiple-argument formulas:

$$\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)=-1+2\cos^2\left(\frac{125}{384\,\pi}\right)-2\cos\left(\frac{125}{384\,\pi}\right)\sin\left(\frac{125}{384\,\pi}\right)$$

$$\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)=1-2\cos\left(\frac{125}{384\,\pi}\right)\sin\left(\frac{125}{384\,\pi}\right)-2\sin^2\left(\frac{125}{384\,\pi}\right)$$

$$\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)=T_{\frac{125}{192}}\left(\cos\left(\frac{1}{\pi}\right)\right)-\sin\left(\frac{125}{192\,\pi}\right)$$

From the result, we obtain:

1/(((((cos((5 * 10^2)/(768 π)) - sin((5 * 10^2)/(768 π)))))))^19

where the exponent 19 is equal to 11 + 8, where 11 is a Lucas number and 8 is a Fibonacci number

Input:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)\right)^{19}}$$

Exact result:

$$\frac{1}{\left(\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)\right)^{19}}$$

Decimal approximation:

133.7147723975021853100107295880967019756047198495828154313...

133.7147723… result near to the rest mass of Pion meson 134.9766

Alternate forms:

$$-\frac{1}{\left(\sin\left(\frac{125}{192\pi}\right)-\cos\left(\frac{125}{192\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\frac{1}{2}\left(e^{-(125 i)/(192\pi)}+e^{(125 i)/(192\pi)}\right)-\frac{1}{2} i \left(e^{-(125 i)/(192\pi)}-e^{(125 i)/(192\pi)}\right)\right)^{19}}$$

$$1\Big/\left(\left(\cos\left(\frac{1}{192\pi}\right)-\sin\left(\frac{1}{192\pi}\right)\right)^{19}\left(-1-2\sin\left(\frac{1}{96\pi}\right)+2\cos\left(\frac{1}{48\pi}\right)\right)^{19}\left(-1-2\sin\left(\frac{5}{96\pi}\right)+2\cos\left(\frac{5}{48\pi}\right)\right)^{19}\left(-1-2\sin\left(\frac{25}{96\pi}\right)+2\cos\left(\frac{25}{48\pi}\right)\right)^{19}\right)$$

Alternative representations:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}=\frac{1}{\left(\cosh\left(-\frac{5 i\, 10^2}{768\pi}\right)+\cos\left(\frac{\pi}{2}+\frac{5\times 10^2}{768\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}=\frac{1}{\left(\cosh\left(-\frac{5 i\, 10^2}{768\pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}=\frac{1}{\left(\cosh\left(\frac{5 i\, 10^2}{768\pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768\pi}\right)\right)^{19}}$$

Series representations:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}=\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(192\pi)^{-2k}\left((-15\,625)^k+(-1)^{1+k}\left(125-96\pi^2\right)^{2k}\right)}{(2k)!}\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}=\frac{1}{\left(\sum_{k=0}^{\infty}\left(\frac{(-15\,625)^k(192\pi)^{-2k}}{(2k)!}-\frac{e^{i k\pi}\left(\frac{192\pi}{125}\right)^{-1-2k}}{(1+2k)!}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}} = \frac{1}{\left(\sum_{k=0}^{\infty}\left(\frac{(-1)^{1+k}\left(\frac{125}{192\pi}-\frac{\pi}{2}\right)^{1+2k}}{(1+2k)!}-\frac{e^{ik\pi}\left(\frac{192\pi}{125}\right)^{-1-2k}}{(1+2k)!}\right)\right)^{19}}$$

Multiple-argument formulas:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}} = -\frac{1}{\left(1-2\cos^2\left(\frac{125}{384\pi}\right)+\sin\left(\frac{125}{192\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}} = -\frac{1}{\left(-1+2\sin^2\left(\frac{125}{384\pi}\right)+\sin\left(\frac{125}{192\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}} = \frac{1}{\left(T_{\frac{125}{192}}\left(\cos\left(\frac{1}{\pi}\right)\right)-\sin\left(\frac{125}{192\pi}\right)\right)^{19}}$$

And:

1/(((((cos((5 * 10^2)/(768 π)) - sin((5 * 10^2)/(768 π)))))))^19 – 8

where 8 is a Fibonacci number

Input:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}} - 8$$

Exact result:

$$\frac{1}{\left(\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)\right)^{19}} - 8$$

Decimal approximation:

125.7147723975021853100107295880967019756047198495828154313...

125.7147723975…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternate forms:

$$-8-\frac{1}{\left(\sin\left(\frac{125}{192\pi}\right)-\cos\left(\frac{125}{192\pi}\right)\right)^{19}}$$

$$-8+\frac{1}{\left(\frac{1}{2}\left(e^{-(125 i)/(192\pi)}+e^{(125 i)/(192\pi)}\right)-\frac{1}{2} i\left(e^{-(125 i)/(192\pi)}-e^{(125 i)/(192\pi)}\right)\right)^{19}}$$

$$\left(1+8 \sin^{17}\left(\frac{125}{192\pi}\right)-8 \cos^{19}\left(\frac{125}{192\pi}\right)+152 \sin\left(\frac{125}{192\pi}\right) \cos^{18}\left(\frac{125}{192\pi}\right)-1368 \sin^{2}\left(\frac{125}{192\pi}\right) \cos^{17}\left(\frac{125}{192\pi}\right)+7752 \sin^{3}\left(\frac{125}{192\pi}\right) \cos^{16}\left(\frac{125}{192\pi}\right)-31008 \sin^{4}\left(\frac{125}{192\pi}\right) \cos^{15}\left(\frac{125}{192\pi}\right)+93024 \sin^{5}\left(\frac{125}{192\pi}\right) \cos^{14}\left(\frac{125}{192\pi}\right)-217056 \sin^{6}\left(\frac{125}{192\pi}\right) \cos^{13}\left(\frac{125}{192\pi}\right)+403104 \sin^{7}\left(\frac{125}{192\pi}\right) \cos^{12}\left(\frac{125}{192\pi}\right)-604656 \sin^{8}\left(\frac{125}{192\pi}\right) \cos^{11}\left(\frac{125}{192\pi}\right)+739024 \sin^{9}\left(\frac{125}{192\pi}\right) \cos^{10}\left(\frac{125}{192\pi}\right)-739024 \sin^{10}\left(\frac{125}{192\pi}\right) \cos^{9}\left(\frac{125}{192\pi}\right)+604656 \sin^{11}\left(\frac{125}{192\pi}\right) \cos^{8}\left(\frac{125}{192\pi}\right)-403104 \sin^{12}\left(\frac{125}{192\pi}\right) \cos^{7}\left(\frac{125}{192\pi}\right)+217056 \sin^{13}\left(\frac{125}{192\pi}\right) \cos^{6}\left(\frac{125}{192\pi}\right)-93024 \sin^{14}\left(\frac{125}{192\pi}\right) \cos^{5}\left(\frac{125}{192\pi}\right)+31008 \sin^{15}\left(\frac{125}{192\pi}\right) \cos^{4}\left(\frac{125}{192\pi}\right)-7752 \sin^{16}\left(\frac{125}{192\pi}\right) \cos^{3}\left(\frac{125}{192\pi}\right)+1360 \sin^{17}\left(\frac{125}{192\pi}\right) \cos^{2}\left(\frac{125}{192\pi}\right)-152 \sin^{18}\left(\frac{125}{192\pi}\right) \cos\left(\frac{125}{192\pi}\right)\right) \Big/ \left(\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)\right)^{19}$$

Alternative representations:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}-8=-8+\frac{1}{\left(\cosh\left(-\frac{5 i\, 10^2}{768\pi}\right)+\cos\left(\frac{\pi}{2}+\frac{5\times 10^2}{768\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}-8=-8+\frac{1}{\left(\cosh\left(-\frac{5 i\, 10^2}{768\pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}-8=-8+\frac{1}{\left(\cosh\left(\frac{5 i\, 10^2}{768\pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768\pi}\right)\right)^{19}}$$

Series representations:

$$\frac{1}{\left(\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)\right)^{19}}-8=-8+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(192\pi)^{-2k}\left((-15625)^k+(-1)^{1+k}\left(125-96\pi^2\right)^{2k}\right)}{(2k)!}\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)\right)^{19}}-8 = -8+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-15\,625)^k\,(192\pi)^{-1-2k}\,(-125\,(2k)!+192\pi\,(1+2k)!)}{(2k)!\,(1+2k)!}\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)\right)^{19}}-8 = -8+\frac{1}{\left(\sum_{k=0}^{\infty}\left(\frac{(-1)^{-1+k}\left(\frac{125}{192\pi}-\frac{\pi}{2}\right)^{1+2k}}{(1+2k)!}+\frac{(-1)^{1+k}\,125^{1+2k}\,(192\pi)^{-1-2k}}{(1+2k)!}\right)\right)^{19}}$$

Multiple-argument formulas:

$$\frac{1}{\left(\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)\right)^{19}}-8 = -8+\frac{1}{\left(T_{\frac{125}{192}}\left(\cos\left(\frac{1}{\pi}\right)\right)-\sin\left(\frac{125}{192\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)\right)^{19}}-8 = -8+\frac{1}{\left(-1+2\cos^2\left(\frac{125}{384\pi}\right)-2\cos\left(\frac{125}{384\pi}\right)\sin\left(\frac{125}{384\pi}\right)\right)^{19}}$$

$$\frac{1}{\left(\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)\right)^{19}}-8 = -8+\frac{1}{\left(1-2\cos\left(\frac{125}{384\pi}\right)\sin\left(\frac{125}{384\pi}\right)-2\sin^2\left(\frac{125}{384\pi}\right)\right)^{19}}$$

$T_n(x)$ is the Chebyshev polynomial of the first kind

In conclusion, performing the 64th root:

(((((cos((5 * 10^2)/(768 π)) - sin((5 * 10^2)/(768 π)))))))^1/64

Input:

$$\sqrt[64]{\cos\left(\frac{5\times10^2}{768\pi}\right)-\sin\left(\frac{5\times10^2}{768\pi}\right)}$$

Exact result:

$$\sqrt[64]{\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)}$$

Decimal approximation:

0.995982017326860600787685769715711218867654510292850800244...

0.99598201732…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the dilaton value **0.989117352243 = ϕ**

Alternate form:

$$\sqrt[64]{\frac{1}{2}\left(e^{-(125 i)/(192\pi)}+e^{(125 i)/(192\pi)}\right)-\frac{1}{2} i\left(e^{-(125 i)/(192\pi)}-e^{(125 i)/(192\pi)}\right)}$$

All 64th roots of cos(125/(192 π)) - sin(125/(192 π)):

$$e^0 \sqrt[64]{\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)} \approx 0.995982 \text{ (real, principal root)}$$

$$e^{(i\pi)/32} \sqrt[64]{\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)} \approx 0.991186+0.09762 i$$

$$e^{(i\pi)/16} \sqrt[64]{\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)} \approx 0.976845+0.19431 i$$

$$e^{(3 i\pi)/32} \sqrt[64]{\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)} \approx 0.95310+0.28912 i$$

$$e^{(i\pi)/8} \sqrt[64]{\cos\left(\frac{125}{192\pi}\right)-\sin\left(\frac{125}{192\pi}\right)} \approx 0.92017+0.38115 i$$

Alternative representations:

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\cosh\left(-\frac{5\,i\,10^2}{768\,\pi}\right)+\cos\left(\frac{\pi}{2}+\frac{5\times 10^2}{768\,\pi}\right)}$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\cosh\left(-\frac{5\,i\,10^2}{768\,\pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768\,\pi}\right)}$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\cosh\left(\frac{5\,i\,10^2}{768\,\pi}\right)-\cos\left(\frac{\pi}{2}-\frac{5\times 10^2}{768\,\pi}\right)}$$

Series representations:

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\sum_{k=0}^{\infty} \frac{(192\,\pi)^{-2k}\left((-15\,625)^k+(-1)^{1+k}\left(125-96\,\pi^2\right)^{2k}\right)}{(2\,k)!}}$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\sum_{k=0}^{\infty}\left(\frac{(-15\,625)^k\,(192\,\pi)^{-2k}}{(2\,k)!}-\frac{e^{i\,k\,\pi}\left(\frac{192\,\pi}{125}\right)^{-1-2k}}{(1+2\,k)!}\right)}$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\sum_{k=0}^{\infty}\left(\frac{(-1)^{1+k}\left(\frac{125}{192\,\pi}-\frac{\pi}{2}\right)^{1+2k}}{(1+2\,k)!}-\frac{e^{i\,k\,\pi}\left(\frac{192\,\pi}{125}\right)^{-1-2k}}{(1+2\,k)!}\right)}$$

Integral representations:

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \sqrt[64]{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} -\frac{i\,e^{-15\,625/\left(147\,456\,\pi^2\,s\right)+s}\,(-125+384\,\pi\,s)}{768\,\pi^{3/2}\,s^{3/2}}\,ds} \quad \text{for } \gamma > 0$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\,\pi}\right)-\sin\left(\frac{5\times 10^2}{768\,\pi}\right)} = \frac{\sqrt[64]{-96\,i\sqrt{\pi}\,\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-15625/\left(147456\,\pi^2\,s\right)+s}}{\sqrt{s}}\,ds-125\int_0^1\cos\left(\frac{125\,t}{192\,\pi}\right)dt}}{2^{3/32}\,\sqrt[64]{3\,\pi}} \quad \text{for } \gamma > 0$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)} = \frac{\sqrt[64]{125\, i \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-15625/(147456\pi^2 s)+s}}{s^{3/2}}\, ds - 768\pi^{3/2} \int_{\frac{\pi}{2}}^{\frac{125}{192\pi}} \sin(t)\, dt}}{\sqrt[8]{2}\ \sqrt[64]{3}\ \pi^{3/128}} \quad \text{for } \gamma > 0$$

Multiple-argument formulas:

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)} = \sqrt[64]{T_{\frac{125}{192}}\left(\cos\left(\frac{1}{\pi}\right)\right)-\sin\left(\frac{125}{192\pi}\right)}$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)} = \sqrt[64]{-1+2\cos^2\left(\frac{125}{384\pi}\right)-2\cos\left(\frac{125}{384\pi}\right)\sin\left(\frac{125}{384\pi}\right)}$$

$$\sqrt[64]{\cos\left(\frac{5\times 10^2}{768\pi}\right)-\sin\left(\frac{5\times 10^2}{768\pi}\right)} = \sqrt[64]{1-2\cos\left(\frac{125}{384\pi}\right)\sin\left(\frac{125}{384\pi}\right)-2\sin^2\left(\frac{125}{384\pi}\right)}$$

Now, we have:

$$\tilde{Z}[m,g] = Z[m,g]\exp\left(2\pi i\int_Y \lambda(m)\wedge\frac{p_1(Y)}{48}\right)\ , \qquad (3.22)$$

Utilizing always the same previous values, we obtain:

exp((((2Pi*i) integrate [1/2 * (-5)]x)))

Input:

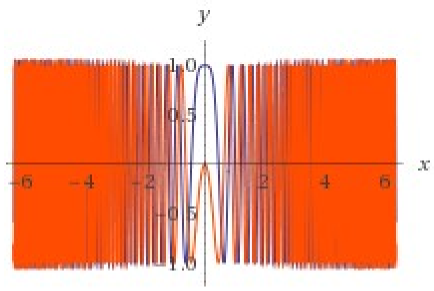
$$\exp\left(2\pi i\int\left(\frac{1}{2}\times(-5)\right)x\, dx\right)$$

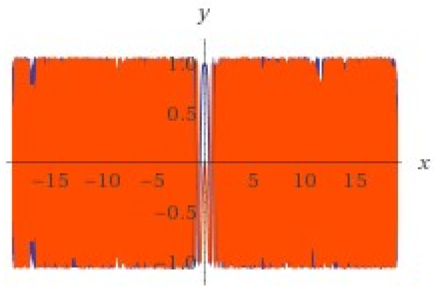
i is the imaginary unit

Exact result:

$$e^{-5/2\, i\pi x^2}$$

Plots:





Alternate form assuming x is real:

$$\cos\left(\frac{5\pi x^2}{2}\right) - i \sin\left(\frac{5\pi x^2}{2}\right)$$

Series expansion of the integral at x = 0:

$$1 - \frac{5}{2} i \pi x^2 - \frac{25 \pi^2 x^4}{8} + O(x^5)$$

(Taylor series)

Indefinite integral:

$$\exp\left(2 \pi i \int -\frac{5x}{2}\, dx\right) = e^{-\frac{5}{2} i \pi x^2 + \text{constant}}$$

From the solution

$$\cos\left(\frac{5\pi x^2}{2}\right) - i \sin\left(\frac{5\pi x^2}{2}\right)$$

for x = 5, (where 5 is a Fibonacci number) we obtain:

cos((5 π 5^2)/2) - i sin((5 π 5^2)/2)

Input:

$$\cos\left(\frac{1}{2}(5\pi \times 5^2)\right) - i \sin\left(\frac{1}{2}(5\pi \times 5^2)\right)$$

i is the imaginary unit

Result:

$-i$

Polar coordinates:

$r = 1$ (radius), $\theta = -90°$ (angle)

Alternative representations:

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \cosh\left(\frac{5}{2}\, i\pi 5^2\right) - i\cos\left(\frac{\pi}{2} - \frac{5\pi 5^2}{2}\right)$$

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \cosh\left(-\frac{5}{2}\, i\pi 5^2\right) - i\cos\left(\frac{\pi}{2} - \frac{5\pi 5^2}{2}\right)$$

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \cosh\left(-\frac{5}{2}\, i\pi 5^2\right) + i\cos\left(\frac{\pi}{2} + \frac{5\pi 5^2}{2}\right)$$

Series representations:

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \sum_{k=0}^{\infty}\left(-2(-1)^k\, i\, J_{1+2k}\left(\frac{125\pi}{2}\right) + \frac{(-1)^{1+k}\, 62^{1+2k}\, \pi^{1+2k}}{(1+2k)!}\right)$$

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \sum_{k=0}^{\infty}\left(-2(-1)^k\, i\, J_{1+2k}\left(\frac{125\pi}{2}\right) + \frac{\left(-\frac{15625}{4}\right)^k \pi^{2k}}{(2k)!}\right)$$

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \sum_{k=0}^{\infty}\left(\frac{\left(-\frac{15625}{4}\right)^k \pi^{2k}}{(2k)!} - \frac{i\left(\left(\frac{2}{125}\right)^{-1-2k} e^{i k\pi}\, \pi^{1+2k}\right)}{(1+2k)!}\right)$$

Integral representations:

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = 1 + \int_0^1 -\frac{125}{2}\,\pi\left(i\cos\left(\frac{125\pi t}{2}\right) + \sin\left(\frac{125\pi t}{2}\right)\right)dt$$

$$\cos\left(\frac{5}{2}\left(\pi 5^2\right)\right) - i\sin\left(\frac{5}{2}\left(\pi 5^2\right)\right) = \int_0^1\left(-\frac{125}{2}\, i\pi\cos\left(\frac{125\pi t}{2}\right) - 62\pi\sin\left(\pi\left(\frac{1}{2} + 62t\right)\right)\right)dt$$

$$\cos\left(\frac{5}{2}(\pi 5^2)\right) - i\sin\left(\frac{5}{2}(\pi 5^2)\right) = \int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma} \frac{e^{-(15625\pi^2)/(16s)+s}(-125 i\pi + 4s)\sqrt{\pi}}{8\pi s^{3/2}\mathcal{A}}\, ds \quad \text{for } \gamma > 0$$

Half-argument formula:

$$\cos\left(\frac{5}{2}(\pi 5^2)\right) - i\sin\left(\frac{5}{2}(\pi 5^2)\right) = (-1)^{1+\lfloor \mathrm{Re}(125\pi)/(2\pi)\rfloor} i \sqrt{\frac{1}{2}(1-\cos(125\pi))} \left(1 - \left(1 + (-1)^{\lfloor -\mathrm{Re}(125\pi)/(2\pi)\rfloor + \lfloor \mathrm{Re}(125\pi)/(2\pi)\rfloor}\right)\theta(-\mathrm{Im}(125\pi))\right) + (-1)^{\lfloor (\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor} \sqrt{\frac{1}{2}(1+\cos(125\pi))} \left(1 - \left(1 + (-1)^{\lfloor -(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor + \lfloor (\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor}\right)\theta(-\mathrm{Im}(125\pi))\right)$$

Multiple-argument formulas:

$$\cos\left(\frac{5}{2}(\pi 5^2)\right) - i\sin\left(\frac{5}{2}(\pi 5^2)\right) = -1 + 2\cos^2\left(\frac{125\pi}{4}\right) - 2i\cos\left(\frac{125\pi}{4}\right)\sin\left(\frac{125\pi}{4}\right)$$

$$\cos\left(\frac{5}{2}(\pi 5^2)\right) - i\sin\left(\frac{5}{2}(\pi 5^2)\right) = 1 - 2i\cos\left(\frac{125\pi}{4}\right)\sin\left(\frac{125\pi}{4}\right) - 2\sin^2\left(\frac{125\pi}{4}\right)$$

$$\cos\left(\frac{5}{2}(\pi 5^2)\right) - i\sin\left(\frac{5}{2}(\pi 5^2)\right) = -1 + 2\cos^2\left(\frac{125\pi}{4}\right) - 3i\sin\left(\frac{125\pi}{6}\right) + 4i\sin^3\left(\frac{125\pi}{6}\right)$$

And:

1/((((1/2(((cos((5 π 5^2)/2) - i sin((5 π 5^2)/2)))))))))^1/384

where 384 = 64 * 6

Input:

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{1}{2}(5\pi\times 5^2)\right) - i\sin\left(\frac{1}{2}(5\pi\times 5^2)\right)\right)}}$$

i is the imaginary unit

Exact result:

$$\sqrt[768]{-1}\ \sqrt[384]{2}$$

Decimal approximation:

1.00179831923214082196718018992585437697004399881740171... +
0.00409799452422547796373385507184309419682441399448918422... i

Polar coordinates:

$r \approx 1.00181$ (radius), $\theta \approx 0.234375°$ (angle)

1.00181 result very near to the value of the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{2\pi}{5}}}{\sqrt{\varphi\sqrt{5}-\varphi}} = 1+\frac{e^{-2\pi}}{1+\frac{e^{-4\pi}}{1+\frac{e^{-6\pi}}{1+\frac{e^{-8\pi}}{1+\ldots}}}} \approx 1.0018674362$$

Alternate forms:

$$\sqrt[384]{2}\cos\left(\frac{\pi}{768}\right)+i\sqrt[384]{2}\sin\left(\frac{\pi}{768}\right)$$

$$\sqrt[384]{2}\, e^{(i\pi)/768}$$

Alternative representations:

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{1}{\sqrt[384]{\frac{1}{2}\left(\cosh\left(\frac{5}{2}\,i\pi 5^2\right)-i\cos\left(\frac{\pi}{2}-\frac{5\pi 5^2}{2}\right)\right)}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{1}{\sqrt[384]{\frac{1}{2}\left(\cosh\left(-\frac{5}{2}\,i\pi 5^2\right)+i\cos\left(\frac{\pi}{2}+\frac{5\pi 5^2}{2}\right)\right)}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{1}{\sqrt[384]{\frac{1}{2}\left(\cosh\left(-\frac{5}{2}\,i\pi 5^2\right)-i\cos\left(\frac{\pi}{2}-\frac{5\pi 5^2}{2}\right)\right)}}$$

Series representations:

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[384]{2}}{\sqrt[384]{\sum_{k=0}^{\infty}\left(-2(-1)^k\, i\, J_{1+2k}\left(\frac{125\pi}{2}\right)+\frac{\left(-\frac{15625}{4}\right)^k \pi^{2k}}{(2k)!}\right)}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[384]{2}}{\sqrt[384]{\sum_{k=0}^{\infty}\left(-2(-1)^k\, i\, J_{1+2k}\left(\frac{125\pi}{2}\right)+\frac{(-1)^{1+k}\, 62^{1+2k}\, \pi^{1+2k}}{(1+2k)!}\right)}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[384]{2}}{\sqrt[384]{\sum_{k=0}^{\infty}\left(\frac{\left(-\frac{15625}{4}\right)^k \pi^{2k}}{(2k)!}-\frac{i\left(\left(\frac{2}{125}\right)^{-1-2k} e^{ik\pi}\, \pi^{1+2k}\right)}{(1+2k)!}\right)}}$$

Integral representations:

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[192]{2}}{\sqrt[384]{2+\int_0^1 -125\pi\left(i\cos\left(\frac{125\pi t}{2}\right)+\sin\left(\frac{125\pi t}{2}\right)\right)dt}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[192]{2}}{\sqrt[384]{\int_0^1 -\pi\left(125\, i\cos\left(\frac{125\pi t}{2}\right)+124\sin\left(\pi\left(\frac{1}{2}+62t\right)\right)\right)dt}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[384]{2}}{\sqrt[384]{\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(15625\pi^2)/(16s)+s}(-125i\pi+4s)\sqrt{\pi}}{8\pi s^{3/2}\mathcal{A}}\,ds}} \quad \text{for } \gamma > 0$$

Half-argument formula:

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \left(\sqrt[384]{2}\right) \Big/ \left(\left((-1)^{1+\lfloor \mathrm{Re}(125\pi)/(2\pi)\rfloor}\, i\sqrt{\frac{1}{2}(1-\cos(125\pi))}\left(1-\left(1+(-1)^{\lfloor -\mathrm{Re}(125\pi)/(2\pi)\rfloor+\lfloor \mathrm{Re}(125\pi)/(2\pi)\rfloor}\right)\theta(-\mathrm{Im}(125\pi))\right)+(-1)^{\lfloor(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor}\sqrt{\frac{1}{2}(1+\cos(125\pi))}\left(1-\left(1+(-1)^{\lfloor -(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor+\lfloor(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor}\right)\theta(-\mathrm{Im}(125\pi))\right)\right)^{\wedge}(1/384)\right)$$

Multiple-argument formulas:

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{1}{\sqrt[384]{-\frac{1}{2}+\cos^2\left(\frac{125\pi}{4}\right)-i\left(\cos\left(\frac{125\pi}{4}\right)\sin\left(\frac{125\pi}{4}\right)\right)}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{1}{\sqrt[384]{\frac{1}{2}-i\left(\cos\left(\frac{125\pi}{4}\right)\sin\left(\frac{125\pi}{4}\right)\right)-\sin^2\left(\frac{125\pi}{4}\right)}}$$

$$\frac{1}{\sqrt[384]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}} = \frac{\sqrt[384]{2}}{\sqrt[384]{1-3\,i\sin\left(\frac{125\pi}{6}\right)+4\,i\sin^3\left(\frac{125\pi}{6}\right)-2\sin^2\left(\frac{125\pi}{4}\right)}}$$

And from

1/((((1/((((1/2(((cos((5 π 5^2)/2) - i sin((5 π 5^2)/2))))))))^1/64))))

We obtain:

Input:

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{1}{2}\left(5\pi\times 5^2\right)\right)-i\sin\left(\frac{1}{2}\left(5\pi\times 5^2\right)\right)\right)}}}$$

i is the imaginary unit

Exact result:

$$-\frac{(-1)^{127/128}}{\sqrt[64]{2}}$$

Decimal approximation:

0.98893007621121041364724401519477953210858243711400600011... −
0.02427687073305984434677183080943970860963856081588685911... i

Polar coordinates:

$r \approx 0.989228$ (radius), $\theta \approx -1.40625°$ (angle)

0.989228 result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate forms:

$$\sqrt[32]{\frac{1}{2}-\frac{i}{2}}$$

$$\frac{\cos\left(\frac{\pi}{128}\right)}{\sqrt[64]{2}}-\frac{i\sin\left(\frac{\pi}{128}\right)}{\sqrt[64]{2}}$$

$$-\frac{e^{(127 i \pi)/128}}{\sqrt[64]{2}}$$

Minimal polynomial:

$$2x^{64}-2x^{32}+1$$

Alternative representations:

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cosh\left(\frac{5}{2} i \pi 5^2\right)-i\cos\left(\frac{\pi}{2}-\frac{5\pi 5^2}{2}\right)\right)}}}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cosh\left(-\frac{5}{2} i \pi 5^2\right)+i\cos\left(\frac{\pi}{2}+\frac{5\pi 5^2}{2}\right)\right)}}}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cosh\left(-\frac{5}{2}i\pi 5^2\right)-i\cos\left(\frac{\pi}{2}-\frac{5\pi 5^2}{2}\right)\right)}}}$$

Series representations:

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{\sqrt[64]{\sum_{k=0}^{\infty}\left(-2(-1)^k\, i\, J_{1+2k}\left(\frac{125\pi}{2}\right)+\frac{\left(-\frac{15625}{4}\right)^k \pi^{2k}}{(2k)!}\right)}}{\sqrt[64]{2}}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{\sqrt[64]{\sum_{k=0}^{\infty}\left(-2(-1)^k\, i\, J_{1+2k}\left(\frac{125\pi}{2}\right)+\frac{(-1)^{1+k}\, 62^{1+2k}\, \pi^{1+2k}}{(1+2k)!}\right)}}{\sqrt[64]{2}}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{\sqrt[64]{\sum_{k=0}^{\infty}\left(\frac{\left(-\frac{15625}{4}\right)^k \pi^{2k}}{(2k)!}-\frac{i\left(\left(\frac{2}{125}\right)^{-1-2k} e^{i k \pi}\, \pi^{1+2k}\right)}{(1+2k)!}\right)}}{\sqrt[64]{2}}$$

Integral representations:

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{\sqrt[64]{2+\int_0^1 -125\pi\left(i\cos\left(\frac{125\pi t}{2}\right)+\sin\left(\frac{125\pi t}{2}\right)\right)dt}}{\sqrt[32]{2}}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{\sqrt[64]{\int_0^1 -\pi\left(125\, i\cos\left(\frac{125\pi t}{2}\right)+124\sin\left(\pi\left(\frac{1}{2}+62t\right)\right)\right)dt}}{\sqrt[32]{2}}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{\sqrt[64]{\frac{\sqrt{\pi}}{\pi\mathcal{A}}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(15625\pi^2)/(16s)+s}(-125i\pi+4s)}{s^{3/2}}\,ds}}{\sqrt[16]{2}} \quad \text{for } \gamma > 0$$

Half-argument formula:

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \frac{1}{\sqrt[64]{2}}$$

$$\left(\left((-1)^{1+\lfloor \mathrm{Re}(125\pi)/(2\pi)\rfloor} i \sqrt{\frac{1}{2}(1-\cos(125\pi))}\left(1-\left(1+(-1)^{\lfloor -\mathrm{Re}(125\pi)/(2\pi)\rfloor+\lfloor \mathrm{Re}(125\pi)/(2\pi)\rfloor}\right)\theta(-\mathrm{Im}(125\pi))\right)+(-1)^{\lfloor(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor}\sqrt{\frac{1}{2}(1+\cos(125\pi))}\left(1-\left(1+(-1)^{\lfloor -(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor+\lfloor(\pi+\mathrm{Re}(125\pi))/(2\pi)\rfloor}\right)\theta(-\mathrm{Im}(125\pi))\right)\right)\hat{}\,(1/64)\right)$$

Multiple-argument formulas:

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \sqrt[64]{-\frac{1}{2}+\cos^2\left(\frac{125\pi}{4}\right)-i\left(\cos\left(\frac{125\pi}{4}\right)\sin\left(\frac{125\pi}{4}\right)\right)}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \sqrt[64]{\frac{1}{2}-i\left(\cos\left(\frac{125\pi}{4}\right)\sin\left(\frac{125\pi}{4}\right)\right)-\sin^2\left(\frac{125\pi}{4}\right)}$$

$$\frac{1}{\frac{1}{\sqrt[64]{\frac{1}{2}\left(\cos\left(\frac{5\pi 5^2}{2}\right)-i\sin\left(\frac{5\pi 5^2}{2}\right)\right)}}} = \sqrt[64]{-\frac{1}{2}+\cos^2\left(\frac{125\pi}{4}\right)-\frac{3}{2}i\sin\left(\frac{125\pi}{6}\right)+2i\sin^3\left(\frac{125\pi}{6}\right)}$$

Now, we have that:

For odd p, the condition (4.27) can be solved by $k = \frac{p+1}{2}$

$$Z[\pi, K] \rightarrow Z[\pi, K] \exp\left(2\pi i \frac{1-2k}{p} \int K\right) .$$

For p = 5, k = 3 and K =8, (where 8 is a Fibonacci numbers), from

exp(2Pi*i*((1-6)/5) integrate [8]x)))   from which

exp-(((-2Pi((1-6)/5) integrate [8]x)))

we obtain:

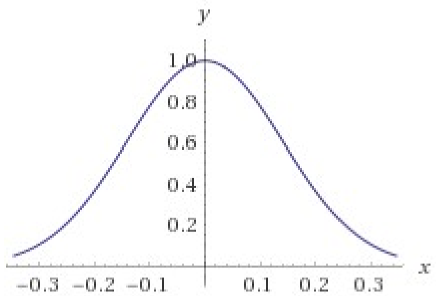
Input:

$$\exp\left(-\left(-2\pi \times \frac{1-6}{5} \int 8\,x\,dx\right)\right)$$

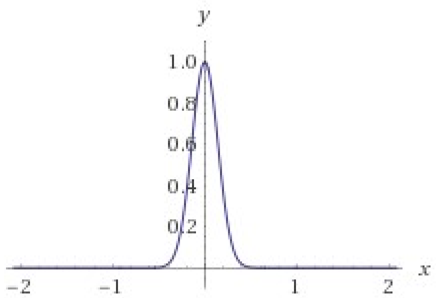
Exact result:

$$e^{-8\pi x^2}$$

Plots:



(x from -0.3 to 0.3)



(x from -2.1 to 2.1)

Series expansion of the integral at x = 0:

$$1 - 8\pi x^2 + 32\pi^2 x^4 + O(x^5)$$

(Taylor series)

Indefinite integral:

$$\exp\left(-\frac{1}{5}\left(-2\pi(1-6)\int 8\,x\,dx\right)\right) = e^{-8\pi x^2 + \text{constant}}$$

From the solution

$e^{-8\pi x^2}$

For x = 1, we obtain:

e^(-8 π 1^2)

Input:

$e^{-8\pi\times 1^2}$

Exact result:

$e^{-8\pi}$

Decimal approximation:

$1.2161556709409308397405550475258851771631170167577743... \times 10^{-11}$

$1.21615567094093...*10^{-11}$

Property:

$e^{-8\pi}$ is a transcendental number

Alternative representations:

$$e^{-8\pi 1^2} = e^{-1440^\circ}$$

$$e^{-8\pi 1^2} = e^{8 i \log(-1)}$$

$$e^{-8\pi 1^2} = \exp^{-8\pi 1^2}(z) \text{ for } z = 1$$

Series representations:

$$e^{-8\pi 1^2} = e^{-32 \sum_{k=0}^{\infty} (-1)^k/(1+2k)}$$

$$e^{-8\pi 1^2} = \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{-8\pi}$$

$$e^{-8\pi 1^2} = \left(\frac{1}{\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}}\right)^{-8\pi}$$

Integral representations:

$$e^{-8\pi 1^2} = e^{-32 \int_0^1 \sqrt{1-t^2}\, dt}$$

$$e^{-8\pi 1^2} = e^{-16 \int_0^1 1/\sqrt{1-t^2}\, dt}$$

$$e^{-8\pi 1^2} = e^{-16 \int_0^\infty 1/(1+t^2)\, dt}$$

(89*10^-8)/(((e^(-8 π 1^2))))+322-11

Where 89 is a Fibonacci number, while 11 and 322 are Lucas numbers

Input interpretation:

$$\frac{89 \times 10^{-8}}{e^{-8\pi \times 1^2}} + 322 - 11$$

Result:

$$311 + \frac{89 e^{8\pi}}{100000000}$$

Decimal approximation:

73492.42087117954579472054629689511758061969378596316393666...

73492.42087

Property:

$311 + \frac{89 e^{8\pi}}{100000000}$ is a transcendental number

Alternate form:

$$\frac{31100000000 + 89 e^{8\pi}}{100000000}$$

Thence, we have the following mathematical connection:

$$\left(311+\frac{89\,e^{8\pi}}{100\,000\,000}\right) = 73492.42087 \Rightarrow$$

$$\Rightarrow -3927 + 2\left(\sqrt[13]{\frac{N\exp\left[\int d\hat{\sigma}\left(-\frac{1}{4u^2}\mathbf{P}_i D\mathbf{P}_i\right)\right]|Bp\rangle_{\rm NS}}{\int[d\mathbf{X}^\mu]\exp\left\{\int d\hat{\sigma}\left(-\frac{1}{4v^2}D\mathbf{X}^\mu D^2\mathbf{X}^\mu\right)\right\}|\mathbf{X}^\mu,\mathbf{X}^i=0\rangle_{\rm NS}}+}\right) =$$

$$-3927+2\sqrt[13]{2.2983717437\times10^{59}+2.0823329825883\times10^{59}}$$

$$= 73490.8437525.... \Rightarrow$$

$$\Rightarrow \left(A(r)\times\frac{1}{B(r)}\left(-\frac{1}{\phi(r)}\right)\times\frac{1}{e^{\Lambda(r)}}\right) \Rightarrow$$

$$\Rightarrow \left(-0.000029211892\times\frac{1}{0.0003644621}\left(-\frac{1}{0.0005946833}\right)\times\frac{1}{0.00183393}\right) =$$

$$= 73491.788325481187105491595720422205480251957265634133987 00...$$

$$= 73491.7883254... \Rightarrow$$

$$\left(\begin{array}{c} I_{21}\ll\int_{-\infty}^{+\infty}\exp\left(-\left(\frac{t}{H}\right)^2\right)\left|\sum_{\lambda\leq P^{1-\varepsilon_2}}\frac{a(\lambda)}{\sqrt{\lambda}}B(\lambda)\lambda^{-i(T+t)}\right|^2 dt\ll \\ \ll H\left\{\left(\frac{4}{\varepsilon_2\log T}\right)^{2r}(\log T)(\log X)^{-2\beta}+(\varepsilon_2^{-2r}(\log T)^{-2r}+\varepsilon_2^{-r}h_1^r(\log T)^{-r})T^{-\varepsilon_1}\right\}\end{array}\right)/$$

$$/(26\times4)^2-24 = \left(\frac{7.9313976505275\times10^8}{(26\times4)^2-24}\right) = 73493.30662\ldots$$

Mathematical connections with the boundary state corresponding to the NSNS-sector of N Dp-branes in the limit of u → ∞, with the ratio concerning the general asymptotically flat solution of the equations of motion of the p-brane and with the Karatsuba's equation concerning the zeros of a special type of function connected with Dirichlet series.

Now, we have also that:

(((e^(-8 π 1^2))))^1/4096

Input:

$$\sqrt[4096]{e^{-8\pi\times 1^2}}$$

Exact result:

$$e^{-\pi/512}$$

Decimal approximation:

0.993882863181447312422244929104462434670072979619464140596...

0.993882863181… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the dilaton value **0.989117352243 = ϕ**

Property:

$e^{-\pi/512}$ is a transcendental number

$e^{-\pi/512}\,e^{0}\approx 0.993883$ (real, principal root)

$e^{-\pi/512}\,e^{(i\pi)/2048}\approx 0.9938817+0.0015246\,i$

$e^{-\pi/512}\,e^{(i\pi)/1024}\approx 0.9938782+0.0030492\,i$

$e^{-\pi/512}\, e^{(3\, i\, \pi)/2048} \approx 0.9938723 + 0.0045738\, i$

$e^{-\pi/512}\, e^{(i\, \pi)/512} \approx 0.9938642 + 0.0060984\, i$

Alternative representations:

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = \sqrt[4096]{e^{-1440\,°}}$$

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = \sqrt[4096]{e^{8\,i\,\log(-1)}}$$

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = \sqrt[4096]{\exp^{-8\,\pi\,1^2}(z)} \quad \text{for } z = 1$$

Series representations:

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = e^{-1/128\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}$$

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = \left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-\pi/512}$$

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = \left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{-\pi/512}$$

Integral representations:

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = e^{-1/128\,\int_0^1 \sqrt{1-t^2}\,dt}$$

$$\sqrt[4096]{e^{-8\,\pi\,1^2}} = e^{-1/256\,\int_0^1 1/\sqrt{1-t^2}\,dt}$$

$$\sqrt[4096]{e^{-8\pi 1^2}} = e^{-1/256 \int_0^\infty 1/(1+t^2)\,dt}$$

From which, we obtain:

2*(((log base 0.993882863181447 (((e^(-8 π 1^2)))))))^1/2 – 3

where 3 is a Fibonacci number

Input interpretation:

$$2\sqrt{\log_{0.993882863181447}\left(e^{-8\pi\times 1^2}\right)} - 3$$

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

Result:

125.0000000000...

125 result equal to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$2\sqrt{\log_{0.9938828631814470000}\left(e^{-8\pi 1^2}\right)} - 3 = -3 + 2\sqrt{\frac{\log\left(e^{-8\pi}\right)}{\log(0.9938828631814470000)}}$$

Series representations:

$$2\sqrt{\log_{0.9938828631814470000}\left(e^{-8\pi 1^2}\right)} - 3 = -3 + 2\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+e^{-8\pi}\right)^k}{k}}{\log(0.9938828631814470000)}}$$

$$2\sqrt{\log_{0.9938828631814470000}\left(e^{-8\pi 1^2}\right)} - 3 = -3 + 2\sqrt{\left(-1.0000000000000000\log\left(e^{-8\pi}\right)\left(162.97517305270092 + \sum_{k=0}^{\infty}(-0.0061171368185530000)^k\,G(k)\right)\right)}$$

$$\text{for}\left(G(0) = 0 \text{ and } \frac{(-1)^k\,k}{2\,(1+k)\,(2+k)} + G(k) = \sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

$$2\sqrt{\log_{0.9938828631814470000}\left(e^{-8\pi\, 1^2}\right)} - 3 = -3 + 2\sqrt{\left(-1.0000000000000000 \log\left(e^{-8\pi}\right) \left(162.97517305270092 + \sum_{k=0}^{\infty} (-0.0061171368185530000)^k\, G(k)\right)\right)}$$

$$\text{for } \left(G(0) = 0 \text{ and } G(k) = \frac{(-1)^{1+k}\, k}{2\,(1+k)\,(2+k)} + \sum_{j=1}^{k} \frac{(-1)^{1+j}\, G(-j+k)}{1+j}\right)$$

Now, we have that:

$$\theta = \pi$$

Considering

$$q^{*}A \in \Omega^{1}(X).$$

equal to 64, we obtain, from the following expression:

$$\exp\left(\frac{1}{2\pi\sqrt{-1}} \int_X \theta\, q^{*}A\right), \qquad (7.2)$$

exp((((1/(2*Pi*sqrt(-1)) integrate [64Pi]x))))

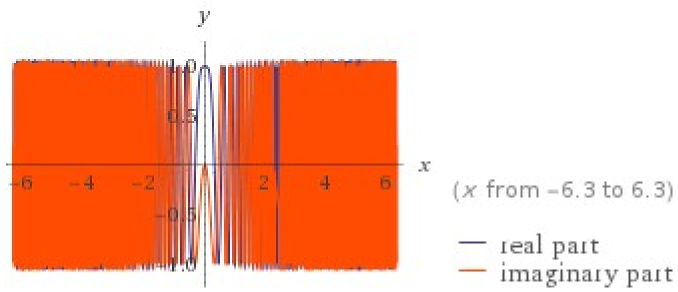
Input:

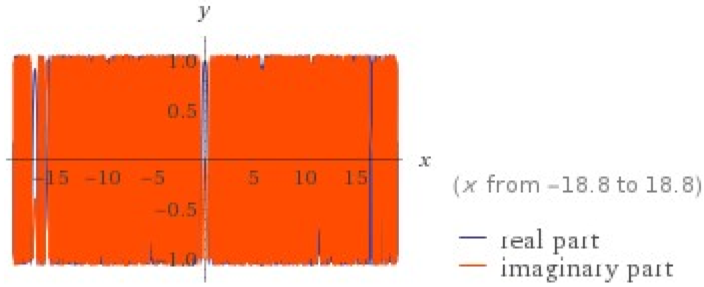
$$\exp\left(\frac{1}{2\pi\sqrt{-1}} \int (64\pi)\, x\, dx\right)$$

Exact result:

$$e^{-16 i x^2}$$

Plots:





Alternate form assuming x is real:

$\cos(16 x^2) - i \sin(16 x^2)$

Series expansion of the integral at x = 0:

$1 - 16 i x^2 - 128 x^4 + O(x^5)$

(Taylor series)

Indefinite integral:

$\exp\left(\frac{1}{2 \pi \sqrt{-1}} \int (64 \pi) x \, dx\right) = e^{-16 i x^2} + \text{constant}$

From $e^{-16 i x^2}$, for x = 2 and multiplying by -1, we obtain:

e^(-16 *-2^2)

Input:

$e^{-16\times(-1)\times 2^2}$

Exact result:

e^{64}

Decimal approximation:

$6.2351490808116168829092387089284697448313918462357999\ldots \times 10^{27}$

$6.23514908081\ldots*10^{27}$

Property:

e^{64} is a transcendental number

Alternative representation:

$e^{-16(-1)2^2} = \exp^{-16(-1)2^2}(z)$ for $z = 1$

Series representations:

$$e^{-16(-1)2^2} = \sum_{k=0}^{\infty} \frac{64^k}{k!}$$

$$e^{-16(-1)2^2} = \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{64}$$

$$e^{-16(-1)2^2} = \frac{1}{\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}\right)^{64}}$$

Integral representation:

$$(1+z)^a = \frac{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(s)\,\Gamma(-a-s)}{z^s}\,ds}{(2\,\pi\,i)\,\Gamma(-a)} \quad \text{for } (0 < \gamma < -\text{Re}(a) \text{ and } |\arg(z)| < \pi)$$

From which:

1/((e^(-16 *-2^2)))^1/4096

Input:

$$\frac{1}{\sqrt[4096]{e^{-16\times(-1)\times 2^2}}}$$

Exact result:

$$\frac{1}{\sqrt[64]{e}}$$

Decimal approximation:

0.984496437005408405986988829697020369707861003180350567476...

0.984496437…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Property:

$\frac{1}{\sqrt[64]{e}}$ is a transcendental number

Alternative representation:

$$\frac{1}{\sqrt[4096]{e^{-16(-1)2^2}}} = \frac{1}{\sqrt[4096]{\exp^{-16(-1)2^2}(z)}} \quad \text{for } z = 1$$

Series representations:

$$\frac{1}{\sqrt[4096]{e^{-16(-1)2^2}}} = \frac{1}{\sqrt[64]{\sum_{k=0}^{\infty} \frac{1}{k!}}}$$

$$\frac{1}{\sqrt[4096]{e^{-16(-1)2^2}}} = \frac{1}{\sqrt[64]{\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}}}$$

$$\frac{1}{\sqrt[4096]{e^{-16(-1)2^2}}} = \frac{\sqrt[64]{2}}{\sqrt[64]{\sum_{k=0}^{\infty} \frac{1+k}{k!}}}$$

and again:

2*sqrt(((((log base 0.984496437 (((1/((e^(-16 *-2^2)))))))))))-3 where 3 is a Fibonacci number

Input interpretation:

$$2\sqrt{\log_{0.984496437}\left(\frac{1}{e^{-16\times(-1)\times 2^2}}\right)}-3$$

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

Result:

125.0000...

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

Alternative representation:

$$2\sqrt{\log_{0.984496}\left(\frac{1}{e^{-16(-1)2^2}}\right)}-3=-3+2\sqrt{\frac{\log\left(\frac{1}{e^{64}}\right)}{\log(0.984496)}}$$

Series representations:

$$2\sqrt{\log_{0.984496}\left(\frac{1}{e^{-16(-1)2^2}}\right)}-3=-3+2\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{e^{64}}\right)^k}{k}}{\log(0.984496)}}$$

$$2\sqrt{\log_{0.984496}\left(\frac{1}{e^{-16(-1)2^2}}\right)}-3=$$
$$-3+2\sqrt{-1+\log_{0.984496}\left(\frac{1}{e^{64}}\right)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\log_{0.984496}\left(\frac{1}{e^{64}}\right)\right)^{-k}$$

$$2\sqrt{\log_{0.984496}\left(\frac{1}{e^{-16(-1)2^2}}\right)}-3=$$
$$-3+2\sqrt{-1+\log_{0.984496}\left(\frac{1}{e^{64}}\right)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+\log_{0.984496}\left(\frac{1}{e^{64}}\right)\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

We have also:

((e^(-16 *-2^2)))^1/13

Input:

$$\sqrt[13]{e^{-16\times(-1)\times 2^2}}$$

Exact result:

$$e^{64/13}$$

Decimal approximation:

137.4248088873354879354828828258476149244161631868758634725...

137.42480888… result very near to the average rest mass of the two Pion mesons that is 137.2733

Property:

$e^{64/13}$ is a transcendental number

All 13th roots of e^64:

$e^{64/13}\, e^0 \approx 137.42$ (real, principal root)

$e^{64/13}\, e^{(2 i \pi)/13} \approx 121.68 + 63.86\, i$

$e^{64/13}\, e^{(4 i \pi)/13} \approx 78.07 + 113.10\, i$

$e^{64/13}\, e^{(6 i \pi)/13} \approx 16.56 + 136.42\, i$

$e^{64/13}\, e^{(8 i \pi)/13} \approx -48.73 + 128.49\, i$

Alternative representation:

$$\sqrt[13]{e^{-16(-1)2^2}} = \sqrt[13]{\exp^{-16(-1)2^2}(z)} \quad \text{for } z = 1$$

Series representations:

$$\sqrt[13]{e^{-16(-1)2^2}} = \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{64/13}$$

$$\sqrt[13]{e^{-16(-1)2^2}} = \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}\right)^{64/13}$$

$$\sqrt[13]{e^{-16(-1)2^2}} = \left(\frac{\sum_{k=0}^{\infty} \frac{-1+k+z}{k!}}{z}\right)^{64/13}$$

Integral representation:

$$(1+z)^a = \frac{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(s)\,\Gamma(-a-s)}{z^s}\,ds}{(2\,\pi\,i)\,\Gamma(-a)} \quad \text{for } (0 < \gamma < -\text{Re}(a) \text{ and } |\arg(z)| < \pi)$$

We can to obtain 125 also as follows:

((e^(-16 *-2^2)))^1/13 -12

Input:

$$\sqrt[13]{e^{-16\times(-1)\times 2^2}} - 12$$

Exact result:

$$e^{64/13} - 12$$

Decimal approximation:

125.4248088873354879354828828258476149244161631868758634725...

125.42480888… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Property:

$-12 + e^{64/13}$ is a transcendental number

Alternative representation:

$$\sqrt[13]{e^{-16(-1)2^2}} - 12 = \sqrt[13]{\exp^{-16(-1)2^2}(z)} - 12 \quad \text{for } z = 1$$

Series representations:

$$\sqrt[13]{e^{-16(-1)2^2}} - 12 = -12 + \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{64/13}$$

$$\sqrt[13]{e^{-16(-1)2^2}} - 12 = -12 + \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}\right)^{64/13}$$

$$\sqrt[13]{e^{-16(-1)2^2}} - 12 = -12 + \left(\frac{\sum_{k=0}^{\infty} \frac{-1+k+z}{k!}}{z}\right)^{64/13}$$

Now, we have this further interpretation of the previous formulas.

We would now like to reinterpret the jump (3.13) in terms of an anomaly involving the fermion mass viewed now as a background field. Analogous to our examples in quantum mechanics, we introduce a new partition function $\tilde{Z}[m, g]$, which depends on an extension of the mass m and metric g into a four-manifold Y with boundary X:

$$\tilde{Z}[m, g] = Z[m, g] \exp\left(-i \int_Y \rho(m) dCS_{\text{grav}}\right) = Z[m, g] \exp\left(-\frac{i}{192\pi} \int_Y \rho(m) \text{Tr}(R \wedge R)\right) , \tag{3.15}$$

where above $\rho(m)$ satisfies the same criteria as in the anomaly in the fermion quantum mechanics theory (3.7). (And as in the discussion there, in the free fermion theory it is natural to take $\rho(m)$ a Heaviside theta-function.) This partition function now retains the

From eq. (3.15), converting the value of the electron mass to temperature (Kelvin), bearing in mind that the electron is a fermion, we obtain:

0.5109989500015 MeV/c^2

convert

0.5109989500015 MeV/k_B (megaelectronvolts per Boltzmann constant) to kelvins

$5.92989657539 \times 10^9$ K (kelvins)

and the formula:

$$Z = \text{tr}(e^{-\beta \hat{H}})$$

From Wikipedia

Quantum mechanical discrete system

For a canonical ensemble that is quantum mechanical and discrete, the canonical partition function is defined as the trace of the Boltzmann factor:

$$Z = \mathrm{tr}(e^{-\beta \hat{H}}),$$

where

β is the thermodynamic beta, defined as $\frac{1}{k_B T}$,

$\hat{H}$ is the Hamiltonian operator.

The dimension of $e^{-\beta \hat{H}}$ is the number of energy eigenstates of the system.

L'operatore hamiltoniano $\hat{H}$ è definito come la somma dell'energia cinetica $\hat{T}$ e dell'energia potenziale $\hat{V} = V(\mathbf{r}, t)$:

$$\hat{H} = \hat{T} + V = \frac{\hat{\mathbf{p}} \cdot \hat{\mathbf{p}}}{2m} + V(\mathbf{r}, t) = -\frac{\hbar^2}{2m}\nabla^2 + V(\mathbf{r}, t)$$

For m = 9.109383701528e-31 (electron mass in kg); $p^2 = (8.5e\text{-}21)^2$; $V = 44 * 10^{-19}$

exp-((((1/(1.38064852e-23 *5.92989657539e+9)*((-(1.054571817e-34)^2)*(8.5e-21)^2))/((2*9.109383701528e-31))+44e-19))))

Input interpretation:

$$\exp\left(-\left(\frac{\frac{1}{1.38064852\times10^{-23}\times5.92989657539\times10^{9}}\left(-(1.054571817\times10^{-34})^2\left(8.5\times10^{-21}\right)^2\right)}{2\times9.109383701528\times10^{-31}} + 44\times10^{-19}\right)\right)$$

Result:

0.99999999999999999560000000000000000967999999999999985803...

0.99999999999999999999…..≈ 1 = H

For T = 15.7 MeV = 2.799e-29 kg and V = 44e-19: T + V = $2.799\times10^{-29} + 44\times10^{-19}$

$4.40000000002799 \times 10^{-18}$

4.4e-18 = H

exp-((((1/(1.38064852e-23 *5.92989657539e+9)*(4.4e-18)))))

Input interpretation:

$$\exp\left(-\left(\frac{1}{1.38064852\times 10^{-23}\times 5.92989657539\times 10^{9}}\times 4.4\times 10^{-18}\right)\right)$$

Result:

0.9999462584...

0.9999462584… = H ≈ 1

exp(((((((-i/(192Pi))) (((((Tr ((((integrate[1/2*5.92989657539×10^9]x)))))))))))))

Input interpretation:

$$\exp\left(-\frac{i}{192\pi}\,\mathrm{Tr}\left[\int\left(\frac{1}{2}\times 5.92989657539\times 10^{9}\right)x\,dx\right]\right)$$

i is the imaginary unit

Result:

$$e^{-(i\,\mathrm{Tr}[1.48247414385\times 10^{9}\,x^{2}])/(192\pi)}$$

Series expansion of the integral at x = 0:

$$e^{-(i\,\mathrm{Tr}[0])/(192\pi)} - 2.45774049999\times 10^{6}\,i\,x^{2}\,e^{-(i\,\mathrm{Tr}[0])/(192\pi)}\,\mathrm{Tr}'(0) + x^{4}\,e^{-(i\,\mathrm{Tr}[0])/(192\pi)}\left(-3.02024418265\times 10^{12}\,\mathrm{Tr}'(0)^{2} - 1.82176837176\times 10^{15}\,i\,\mathrm{Tr}''(0)\right) + O(x^{5})$$

(Taylor series)

exp(-i*(1.48247414385e+9)/(192Pi))

Input interpretation:

$$\exp\left(-i\times\frac{1.48247414385\times 10^{9}}{192\pi}\right)$$

i is the imaginary unit

Result:

$-0.952193... + 0.305499...\,i$

Polar coordinates:

$r = 1.00000$ (radius), $\theta = 162.212°$ (angle)

(-0.952193+0.305499)i

Input interpretation:

$(-0.952193 + 0.305499)\,i$

i is the imaginary unit

Result:

$-0.646694\, i$

Polar coordinates:

$r = 0.646694$ (radius), $\theta = -90°$ (angle)

0.646694

Note that inserting the Trace within the integral, we obtain the same result. Indeed:

exp(((((((-i/(192Pi))) ((((((((integrate[1/2* Tr(5.92989657539×10^9)]x)))))))))))))

Input interpretation:

$$\exp\left(-\frac{i}{192\pi}\int\left(\frac{1}{2}\,\mathrm{Tr}\left[5.92989657539\times 10^{9}\right]\right)x\,dx\right)$$

i is the imaginary unit

Result:

$$e^{-\left(i\,x^{2}\,\mathrm{Tr}\left[5.92989657539\times 10^{9}\right]\right)/(768\pi)}$$

Series expansion of the integral at x = 0:

$$1-\frac{i\,x^{2}\,\mathrm{Tr}\left[5.92989657539\times 10^{9}\right]}{768\pi}-\frac{x^{4}\,\mathrm{Tr}\left[5.92989657539\times 10^{9}\right]^{2}}{1\,179\,648\,\pi^{2}}+O\left(x^{5}\right)$$

(Taylor series)

Indefinite integral assuming all variables are real:

$$\frac{(4-4i)\sqrt{6}\,\pi\,\mathrm{erf}\left(\frac{\left(\frac{1}{16}+\frac{i}{16}\right)x\sqrt{\mathrm{Tr}\left[5.92989657539\times 10^{9}\right]}}{\sqrt{6\pi}}\right)}{\sqrt{\mathrm{Tr}\left[5.92989657539\times 10^{9}\right]}}+\text{constant}$$

exp-((((i*(5.92989657539e+9))/(768Pi))))

Input interpretation:

$$\exp\left(-\frac{i\times 5.92989657539\times 10^{9}}{768\pi}\right)$$

i is the imaginary unit

Result:

$-0.952194... + 0.305495... i$

Polar coordinates:

$r = 1.00000$ (radius), $\theta = 162.212°$ (angle)

(-0.952194 +0.305495)i

Input interpretation:

$(-0.952194 + 0.305495) i$

i is the imaginary unit

Result:

$-0.646699 i$

Polar coordinates:

$r = 0.646699$ (radius), $\theta = -90°$ (angle)

0.646699 (or 0.646665 multiplying the equation by 0.9999462584… = H)

From which, we obtain:

(((-0.952194 +0.305495)i))^1/64

Input interpretation:

$\sqrt[64]{(-0.952194 + 0.305495) i}$

i is the imaginary unit

Result:

$0.99291347... - 0.024374657... i$

Polar coordinates:

$r = 0.993213$ (radius), $\theta = -1.40625°$ (angle)

0.993213

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

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

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

We have also the following result:

Input interpretation:

$-\pi i + 2 i \log_{0.993213}(-(-0.952194 + 0.305495))$

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

i is the imaginary unit

Result:

$124.866\ldots i$

Polar coordinates:

$r = 124.866$ (radius), $\theta = 90°$ (angle)

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

Alternative representation:

$$-i\pi + 2 i \log_{0.993213}(-(-0.952194 + 0.305495)) = -i\pi + \frac{2 i \log(0.646699)}{\log(0.993213)}$$

Series representations:

$$-i\pi + 2 i \log_{0.993213}(-(-0.952194 + 0.305495)) = -i\pi - \frac{2 i \sum_{k=1}^{\infty} \frac{(-1)^k (-0.353301)^k}{k}}{\log(0.993213)}$$

$$-i\pi + 2\,i\log_{0.993213}(-(-0.952194 + 0.305495)) =$$
$$-i\pi - 293.681\,i\log(0.646699) - 2\,i\log(0.646699)\sum_{k=0}^{\infty}(-0.006787)^k\,G(k)$$
$$\text{for}\left(G(0) = 0 \text{ and } G(k) = \frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)} + \sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

From:

https://www.wired.it/scienza/lab/2019/11/20/quinta-forza-universo-bosone/?refresh_ce=

In recent years Hungarian researchers have sought further evidence of the new particle. And now - in an article published in arXiv and not yet subjected to peer review - they claim to have found them, this time observing the change of state of an excited helium nucleus: pairs of electrons and positrons separate at an angle different from that which theoretical models predict, around 115°. According to the authors the anomaly could be explained by the production by the helium atom of a different boson from all those we know, of short duration and with a mass of slightly less than 17 megaelectronvolts. Hence the name of X17. Of course it is very suggestive that several experiments aimed at finding out more about dark matter focused precisely on the existence of a hypothetical 17 megaelectronvolts (precisely 16.84 MeV - author's note) particle.

From:

New evidence supporting the existence of the hypothetic X17 particle

A.J. Krasznahorkay, M. Csatlos, L. Csige, J. Gulyas, M. Koszta, B. Szihalmi, and J. Timar
Institute of Nuclear Research (Atomki), P.O. Box 51, H-4001 Debrecen, Hungary
D.S. Firak, A. Nagy, and N.J. Sas
University of Debrecen, 4010 Debrecen, PO Box 105, Hungary
A. Krasznahorkay
CERN, Geneva, Switzerland and
Institute of Nuclear Research, (Atomki), P.O. Box 51, H-4001 Debrecen, Hungary

https://arxiv.org/abs/1910.10459v1

We observed electron-positron pairs from the electro-magnetically forbidden M0 transition depopulating the 21.01 MeV 0^- state in ^{4}He. A peak was observed in their e^+e^- angular correlations at 115° with 7.2σ significance, and could be described by assuming the creation and subsequent decay of a light particle with mass of m_Xc^2=16.84±0.16($stat$) ± 0.20($syst$) MeV and Γ_X= 3.9 × 10^{-5} eV. According to the mass, it is likely the same X17 particle, which we recently suggested [Phys. Rev. Lett. 116, 052501 (2016)] for describing the anomaly observed in ^{8}Be.

From:

MANUSCRIPT BOOK I OF *SRINIVASA RAMANUJAN*

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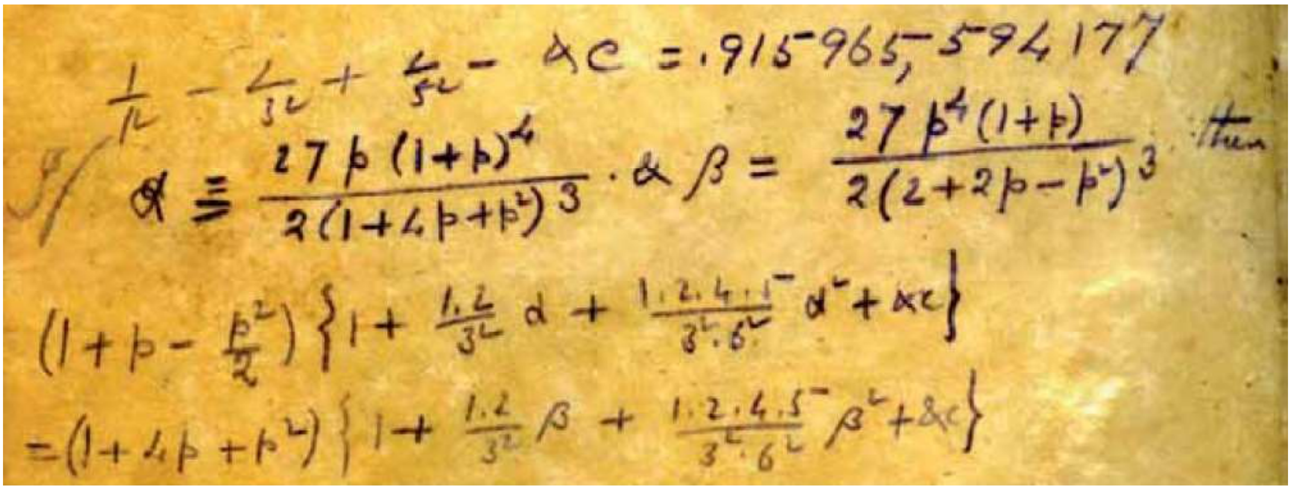

$$\frac{1}{1^2} - \frac{1}{3^2} + \frac{1}{5^2} - \&c = .915\,965\,594\,177$$

If $\alpha = \frac{27p(1+p)^4}{2(1+4p+p^2)^3}$ & $\beta = \frac{27p^4(1+p)}{2(2+2p-p^2)^3}$ then

$$\left(1+p-\frac{p^2}{2}\right)\left\{1 + \frac{1.2}{3^2}\alpha + \frac{1.2.4.5}{3^2.6^2}\alpha^2 + \&c\right\}$$
$$= (1+4p+p^2)\left\{1 + \frac{1.2}{3^2}\beta + \frac{1.2.4.5}{3^2.6^2}\beta^2 + \&c\right\}$$

Now, we have that, for p = 2

((27*2(1+2)^4)) / ((2(1+4*2+2^2)^3)) = α

Input:

$$\frac{27\times 2\,(1+2)^4}{2\,(1+4\times 2+2^2)^3}$$

Exact result:

$$\frac{2187}{2197}$$

Decimal approximation:

0.995448338643604915794264906690942193900773782430587164314...

0.995448338643.... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

((27*2^4(1+2))) / ((2(2+2*2-2^2)^3)) = β

Input:

$$\frac{27\times 2^4\,(1+2)}{2\,(2+2\times 2-2^2)^3}$$

Result:

81

81

(1+4*2+2^2) [1+((1*2*81))/((3^2))+(((1*2*4*5)*81^2))/((3^2*6^2))]

Input:

$$(1+4\times 2+2^2)\left(1+\frac{2\times 81}{3^2}+\frac{(2\times 4\times 5)\times 81^2}{3^2\times 6^2}\right)$$

Result:

10777

10777

(1+2-2^2/2)
[1+((1*2*0.995448338643))/((3^2))+(((1*2*4*5)*0.995448338643^2))/((3^2*6^2))]

Input interpretation:

$$\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.995448338643}{3^2}+\frac{(2\times 4\times 5)\times 0.995448338643^2}{3^2\times 6^2}\right)$$

Result:

1.34354622277339614902240111111111111111111111111111111...

Repeating decimal:

$1.3435462227733961490224 0\overline{1}$ (period 1)

1.34354622277396......

Now, dividing the two results, performing the 3th root and subtracting by π, we obtain:

[10777/ ((((((1+2-2^2/2) (((1+((1*2*0.995448338643))/((3^2))+(((1*2*4*5)*0.995448338643^2))/((3^2*6^2))))))))))]^1/3 – pi

Input interpretation:

$$\sqrt[3]{\frac{10777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.995448338643}{3^2}+\frac{(2\times 4\times 5)\times 0.995448338643^2}{3^2\times 6^2}\right)}}-\pi$$

Result:

16.87614946940...

16.87614946940… result practically equal to the black hole entropy 16.8741 and to the mass of the light particle m_X = 16.84 MeV

Alternative representations:

$$\sqrt[3]{\frac{10777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi = -180\,° + \sqrt[3]{\frac{10777}{1+\frac{1.990896677286000}{9}+\frac{40\times 0.99544833386430000^2}{9\times 6^2}}}$$

$$\sqrt[3]{\frac{10777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi = i\log(-1) + \sqrt[3]{\frac{10777}{1+\frac{1.990896677286000}{9}+\frac{40\times 0.99544833386430000^2}{9\times 6^2}}}$$

$$\sqrt[3]{\frac{10\,777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi =$$
$$-\cos^{-1}(-1)+\sqrt[3]{\frac{10\,777}{1+\frac{1.990896677286000}{9}+\frac{40\times 0.99544833386430000^2}{9\times 6^2}}}$$

Series representations:

$$\sqrt[3]{\frac{10\,777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi =$$
$$20.017742122984893-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\sqrt[3]{\frac{10\,777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi =$$
$$22.017742122984893-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\sqrt[3]{\frac{10\,777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi =$$
$$20.017742122984893-\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\sqrt[3]{\frac{10\,777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi =$$
$$20.017742122984893-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$\sqrt[3]{\frac{10\,777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833386430000}{3^2}+\frac{(2\times 4\times 5)0.99544833386430000^2}{3^2\times 6^2}\right)}}-\pi =$$
$$20.017742122984893-4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$\sqrt[3]{\frac{10777}{\left(1+2-\frac{2^2}{2}\right)\left(1+\frac{2\times 0.99544833864300000}{3^2}+\frac{(2\times 4\times 5)0.99544833864300000^2}{3^2\times 6^2}\right)}}-\pi =$$

$$20.017742122984893 - 2\int_0^\infty \frac{\sin(t)}{t}\,dt$$

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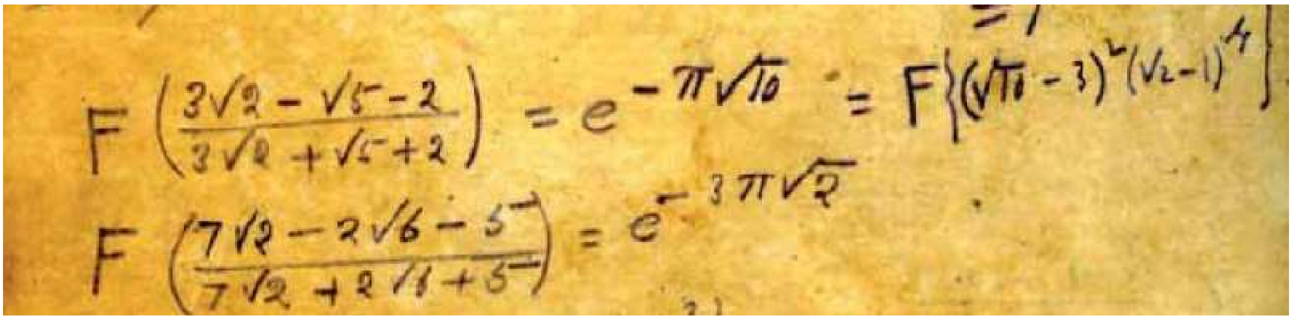


((exp-(Pi*sqrt10))

Input:

$$\exp\left(-\left(\pi\sqrt{10}\right)\right)$$

Exact result:

$$e^{-\sqrt{10}\,\pi}$$

Decimal approximation:

0.0000484688969473602655699186895695436690603737466072270663...

0.00004846889…

Property:

$e^{-\sqrt{10}\,\pi}$ is a transcendental number

Series representations:

$$e^{-\pi\sqrt{10}} = e^{-\pi\sqrt{9}\sum_{k=0}^{\infty} 9^{-k}\binom{1/2}{k}}$$

$$e^{-\pi\sqrt{10}} = \exp\left(-\pi\sqrt{9}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{9}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$e^{-\pi\sqrt{10}} = \exp\left(-\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}9^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)$$

(exp-(3Pi*sqrt2))

Input:

$$\exp\left(-\left(3\pi\sqrt{2}\right)\right)$$

Exact result:

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

Decimal approximation:

$$1.627201622607250929294215673911797954183858113695401 6\ldots\times 10^{-6}$$

$1.627201622\ldots*10^{-6}$

Property:

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

Series representations:

$$e^{-3\left(\pi\sqrt{2}\right)} = \exp\left(-3\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)$$

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

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

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

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

From which, we obtain:

1/(golden ratio*Pi^2) + (((1/(((exp-(3Pi*sqrt2)*1 / exp-(Pi*sqrt10))))-13)))

Input:

$$\frac{1}{\phi \pi^2} + \left(\frac{1}{\exp(-(3 \pi \sqrt{2})) \times \frac{1}{\exp(-(\pi \sqrt{10}))}} - 13\right)$$

ϕ is the golden ratio

Exact result:

$$\frac{1}{\pi^2 \phi} - 13 + e^{3 \sqrt{2} \pi - \sqrt{10} \pi}$$

Decimal approximation:

16.84927714723931180323495401189575055784023282959459012956...

16.84927714… result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Alternate forms:

$$\frac{1}{\pi^2 \phi} - 13 + e^{-\sqrt{2} \left(\sqrt{5} - 3\right) \pi}$$

$$\frac{1}{\pi^2 \phi} - 13 + e^{2 \sqrt{7 - 3 \sqrt{5}} \pi}$$

$$\frac{1}{\pi^2 \phi} - 13 + e^{\left(3 \sqrt{2} - \sqrt{10}\right) \pi}$$

Series representations:

$$\frac{1}{\phi\pi^2}+\left(\frac{1}{\frac{\exp\left(-\left(3\pi\sqrt{2}\right)\right)}{\exp\left(-\left(\pi\sqrt{10}\right)\right)}}-13\right)=-\left(\left(-\exp\left(-3\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)+\right.\right.$$
$$13\phi\pi^2\exp\left(-3\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)-$$
$$\left.\left.\phi\pi^2\exp\left(-\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(10-z_0)^k z_0^{-k}}{k!}\right)\right)\right/$$
$$\left(\phi\pi^2\exp\left(-3\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)\right)\right)$$

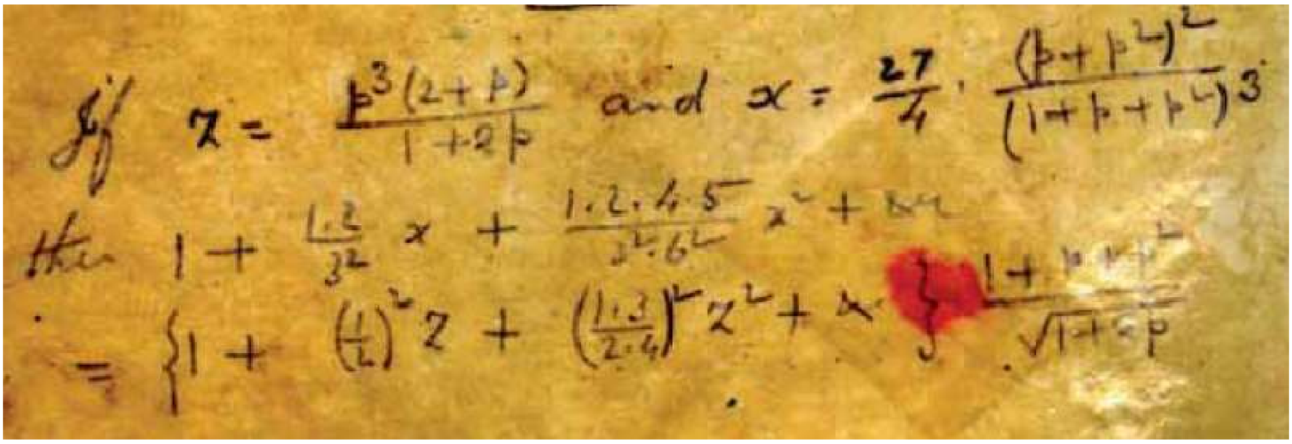
for not $((z_0\in\mathbb{R}$ and $-\infty<z_0\leq 0))$

$$\frac{1}{\phi\pi^2}+\left(\frac{1}{\frac{\exp\left(-\left(3\pi\sqrt{2}\right)\right)}{\exp\left(-\left(\pi\sqrt{10}\right)\right)}}-13\right)=$$
$$-\left(\left(-\exp\left(-3\pi\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+\right.\right.$$
$$13\phi\pi^2\exp\left(-3\pi\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)-$$
$$\left.\left.\phi\pi^2\exp\left(-\pi\exp\left(i\pi\left\lfloor\frac{\arg(10-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(10-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right/$$
$$\left(\phi\pi^2\exp\left(-3\pi\exp\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right)$$

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

$$\frac{1}{\phi\pi^2}+\left(\frac{1}{\frac{\exp\left(-\left(3\pi\sqrt{2}\right)\right)}{\exp\left(-\left(\pi\sqrt{10}\right)\right)}}-13\right)=$$

$$-\left(\left(-\exp\left(-3\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(2-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)+\right.\right.$$
$$13\,\phi\pi^2\exp\left(-3\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(2-z_0)/(2\pi)\rfloor)}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)-\phi\pi^2\exp\left(-\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(10-z_0)/(2\pi)\rfloor}\right.$$
$$\left.\left.z_0^{1/2(1+\lfloor\arg(10-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(10-z_0)^k z_0^{-k}}{k!}\right)\right)\Big/$$
$$\left(\phi\pi^2\exp\left(-3\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(2-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(2-z_0)/(2\pi)\rfloor)}\right.\right.$$
$$\left.\left.\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)\right)\right)$$



For p = 2

((2^3(2+2)))/(1+2*2)

Input:

$$\frac{2^3(2+2)}{1+2\times 2}$$

Exact result:

$\frac{32}{5}$

Decimal form:

6.4

6.4 = z

27/4*(((2+2^2)^2))/(((1+2+2^2)^3))

Input:

$\frac{27}{4} \times \frac{(2+2^2)^2}{(1+2+2^2)^3}$

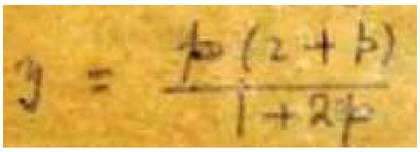
Exact result:

$\frac{243}{343}$

Decimal approximation:

0.708454810495626822157434402332361516034985422740524781341...

0.70845481049... = x



((2(2+2)))/(1+2*2)

Input:

$\frac{2\,(2+2)}{1+2\times 2}$

Exact result:

$\frac{8}{5}$

Decimal form:

1.6

1.6 = y

From the sum of the three results and multiplying by the square root of 3.6180339887498..., we obtain:

sqrt(((5+sqrt5)/2))* (((((2^3(2+2)))/(1+2*2) + 27/4*(((2+2^2)^2))/(((1+2+2^2)^3)) + ((2(2+2)))/(1+2*2))))

Input:

$$\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\left(\frac{2^3\,(2+2)}{1+2\times 2}+\frac{27}{4}\times\frac{(2+2^2)^2}{(1+2+2^2)^3}+\frac{2\,(2+2)}{1+2\times 2}\right)$$

Result:

$$\frac{2987}{343}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}$$

Decimal approximation:

16.564465388767485247299150372036235932086424607193095711 07...

16.56446538… result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Alternate form:

$$\frac{2987}{686}\sqrt{\left(5+\sqrt{5}\right)2}$$

Minimal polynomial:

$$13\,841\,287\,201\,x^4-5\,248\,421\,303\,405\,x^2+398\,025\,498\,322\,805$$

Further, we obtain:

1/(((((2^3(2+2)))/(1+2*2) + 27/4*(((2+2^2)^2))/(((1+2+2^2)^3)) + ((2(2+2)))/(1+2*2))))^1/256

Input:

$$\frac{1}{\sqrt[256]{\frac{2^3\,(2+2)}{1+2\times 2}+\frac{27}{4}\times\frac{(2+2^2)^2}{(1+2+2^2)^3}+\frac{2\,(2+2)}{1+2\times 2}}}$$

Result:

$$\frac{7^{3/256}}{\sqrt[256]{2987}}$$

Decimal approximation:

0.991581361996300838042539064353338810605545171886910858324...

0.991581361… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate form:

$$\frac{7^{3/256}\times 2987^{255/256}}{2987}$$

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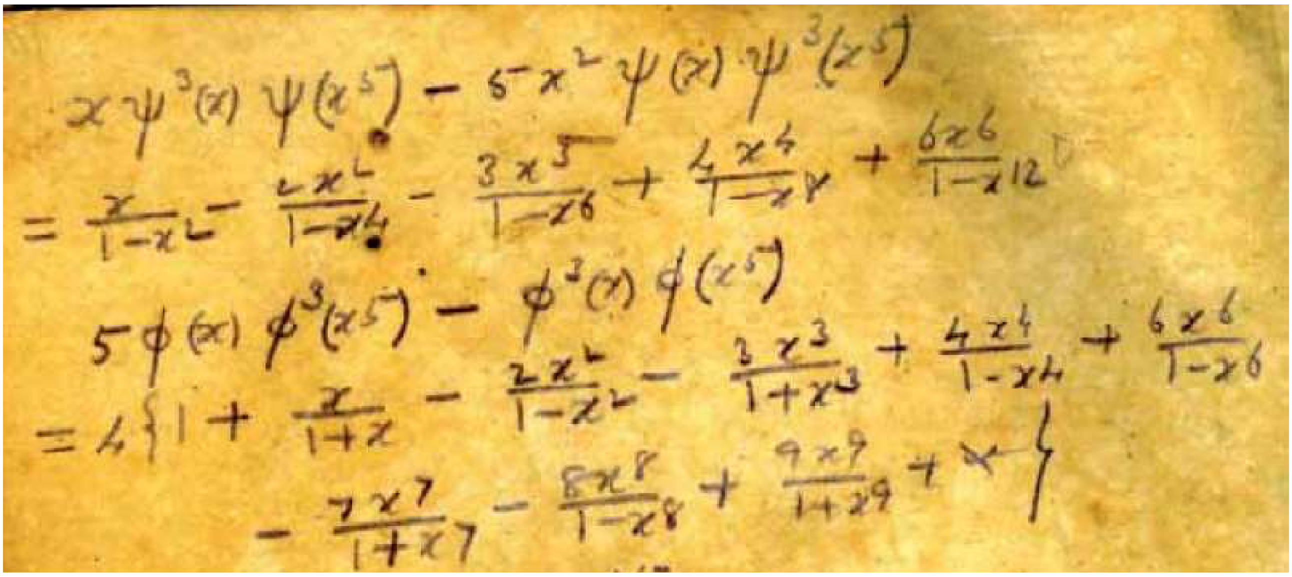


$$x\psi^3(x)\psi(x^5) - 5x^2\psi(x)\psi^3(x^5) = \frac{x}{1-x^2} - \frac{2x^2}{1-x^4} - \frac{3x^3}{1-x^6} + \frac{4x^4}{1-x^8} + \frac{6x^6}{1-x^{12}}$$

$$5\phi(x)\phi^3(x^5) - \phi^3(x)\phi(x^5) = 4\left\{1 + \frac{x}{1+x} - \frac{2x^2}{1-x^2} - \frac{3x^3}{1+x^3} + \frac{4x^4}{1-x^4} + \frac{6x^6}{1-x^6} - \frac{7x^7}{1+x^7} - \frac{8x^8}{1-x^8} + \frac{9x^9}{1+x^9} + \cdots\right\}$$

For x = 2:

2/(1-2^2)-(2*4)/(1-2^4)-(3*8)/(1-2^6)+(4*16)/(1-2^8)+(6*2^6)/(1-2^12)

Input:

$$\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}$$

Exact result:

$$-\frac{322}{3315}$$

Decimal approximation:

−0.09713423831070889894419306184012066365007541478129713423...

-0.0971342383…

2Pi - 1/((((2/(1-2^2)-(2*4)/(1-2^4)-(3*8)/(1-2^6)+(4*16)/(1-2^8)+(6*2^6)/(1-2^12)))))

Input:

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}}$$

Result:

$$\frac{3315}{322} + 2\pi$$

Decimal approximation:

16.57821636308020759493770912680745297336328289812909362952...

16.578216363….. result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Property:

$\frac{3315}{322} + 2\pi$ is a transcendental number

Alternate form:

$$\frac{1}{322}(644\pi + 3315)$$

Alternative representations:

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times4}{1-2^4} - \frac{3\times8}{1-2^6} + \frac{4\times16}{1-2^8} + \frac{6\times2^6}{1-2^{12}}} = 360° - \frac{1}{-\frac{2}{3} - \frac{8}{1-2^4} - \frac{24}{1-2^6} + \frac{64}{1-2^8} + \frac{6\times2^6}{1-2^{12}}}$$

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times4}{1-2^4} - \frac{3\times8}{1-2^6} + \frac{4\times16}{1-2^8} + \frac{6\times2^6}{1-2^{12}}} = -2i\log(-1) - \frac{1}{-\frac{2}{3} - \frac{8}{1-2^4} - \frac{24}{1-2^6} + \frac{64}{1-2^8} + \frac{6\times2^6}{1-2^{12}}}$$

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times4}{1-2^4} - \frac{3\times8}{1-2^6} + \frac{4\times16}{1-2^8} + \frac{6\times2^6}{1-2^{12}}} = 2\cos^{-1}(-1) - \frac{1}{-\frac{2}{3} - \frac{8}{1-2^4} - \frac{24}{1-2^6} + \frac{64}{1-2^8} + \frac{6\times2^6}{1-2^{12}}}$$

Series representations:

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times4}{1-2^4} - \frac{3\times8}{1-2^6} + \frac{4\times16}{1-2^8} + \frac{6\times2^6}{1-2^{12}}} = \frac{3315}{322} + 8\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times4}{1-2^4} - \frac{3\times8}{1-2^6} + \frac{4\times16}{1-2^8} + \frac{6\times2^6}{1-2^{12}}} = \frac{3315}{322} + \sum_{k=0}^{\infty} -\frac{8(-1)^k\, 1195^{-1-2k}\left(5^{1+2k} - 4\times239^{1+2k}\right)}{1+2k}$$

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}} = \frac{3315}{322} + 2\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k \left(\frac{1}{1+2k} + \frac{2}{1+4k} + \frac{1}{3+4k}\right)$$

Integral representations:

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}} = \frac{3315}{322} + 8\int_0^1 \sqrt{1-t^2}\, dt$$

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}} = \frac{3315}{322} + 4\int_0^1 \frac{1}{\sqrt{1-t^2}}\, dt$$

$$2\pi - \frac{1}{\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}} = \frac{3315}{322} + 4\int_0^\infty \frac{1}{1+t^2}\, dt$$

(((-(2/(1-2^2)-(2*4)/(1-2^4)-(3*8)/(1-2^6)+(4*16)/(1-2^8)+(6*2^6)/(1-2^12)))))^1/256

Input:

$$\sqrt[256]{-\left(\frac{2}{1-2^2} - \frac{2\times 4}{1-2^4} - \frac{3\times 8}{1-2^6} + \frac{4\times 16}{1-2^8} + \frac{6\times 2^6}{1-2^{12}}\right)}$$

Result:

$$\sqrt[256]{\frac{322}{3315}}$$

Decimal approximation:

0.9909333004885026868165725769778928711813154116220538212 37...

0.9909333004885…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate form:

$$\frac{\sqrt[256]{322}\ 3315^{255/256}}{3315}$$

8sqrt(((((log base 0.9909333004885 (((-(2/(1-2^2)-(2*4)/(1-2^4)-(3*8)/(1-2^6)+(4*16)/(1-2^8)+(6*2^6)/(1-2^12))))))))))-Pi

Input interpretation:

$$8\sqrt{\log_{0.9909333004885}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi$$

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

Result:

124.85840735...

124.85840735…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi = -\pi+8\sqrt{\frac{\log\left(\frac{-2}{-3}+\frac{8}{1-2^4}+\frac{24}{1-2^6}-\frac{64}{1-2^8}-\frac{6\times 2^6}{1-2^{12}}\right)}{\log(0.99093330048850000)}}$$

Series representations:

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi = -\pi+8\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{2993}{3315}\right)^k}{k}}{\log(0.99093330048850000)}}$$

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi = -\pi+8\sqrt{-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)\right)^{-k}$$

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi = -\pi+8\sqrt{-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

4(((1+2/3-2*4/(1-4)-3*8/(1+8)+4*16/(1-16)+(6*2^6)/(1-2^6)-(7*2^7)/(1+2^7)-(8*2^8)/(1-2^8)+(9*2^9)/(1+2^9))))

Input:

$$4\left(1+\frac{2}{3}-2\times\frac{4}{1-4}-3\times\frac{8}{1+8}+4\times\frac{16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)$$

Exact result:

$$\frac{533892}{97223}$$

Decimal approximation:

5.4914166400954506649661088425578309659237011818191168756 36...

5.49141664009...

12(((1+2/3-2*4/(1-4)-3*8/(1+8)+4*16/(1-16)+(6*2^6)/(1-2^6)-(7*2^7)/(1+2^7)-(8*2^8)/(1-2^8)+(9*2^9)/(1+2^9))))

Input:

$$12\left(1+\frac{2}{3}-2\times\frac{4}{1-4}-3\times\frac{8}{1+8}+4\times\frac{16}{1-16}+\frac{6\times2^6}{1-2^6}-\frac{7\times2^7}{1+2^7}-\frac{8\times2^8}{1-2^8}+\frac{9\times2^9}{1+2^9}\right)$$

Exact result:

$$\frac{1601676}{97223}$$

Decimal approximation:

16.47424992028635199489832652767349289777110354545735062690...

16.47424992.... result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

1/[4(((1+2/3-2*4/(1-4)-3*8/(1+8)+4*16/(1-16)+(6*2^6)/(1-2^6)-(7*2^7)/(1+2^7)-(8*2^8)/(1-2^8)+(9*2^9)/(1+2^9))))]^1/256

Input:

$$\frac{1}{\sqrt[256]{4\left(1+\frac{2}{3}-2\times\frac{4}{1-4}-3\times\frac{8}{1+8}+4\times\frac{16}{1-16}+\frac{6\times2^6}{1-2^6}-\frac{7\times2^7}{1+2^7}-\frac{8\times2^8}{1-2^8}+\frac{9\times2^9}{1+2^9}\right)}}$$

Result:

$$\frac{\sqrt[256]{\frac{97223}{133473}}}{\sqrt[128]{2}}$$

Decimal approximation:

0.993369011342215081271900694747689088058725146793831390260...

0.993369011342215…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the dilaton value **0.989117352243** = ϕ

Alternate form:

$$\frac{\sqrt[256]{97223}\ 2^{127/128} \times 133473^{255/256}}{266946}$$

1/2*log base 0.993369011342215 (((1/[4(((1+2/3-2*4/(1-4)-3*8/(1+8)+4*16/(1-16)+(6*2^6)/(1-2^6)-(7*2^7)/(1+2^7)-(8*2^8)/(1-2^8)+(9*2^9)/(1+2^9))))])))-Pi

Input interpretation:

$$\frac{1}{2}\log_{0.993369011342215}\left(\frac{1}{4\left(1+\frac{2}{3}-2\times\frac{4}{1-4}-3\times\frac{8}{1+8}+4\times\frac{16}{1-16}+\frac{6\times2^6}{1-2^6}-\frac{7\times2^7}{1+2^7}-\frac{8\times2^8}{1-2^8}+\frac{9\times2^9}{1+2^9}\right)}\right)-\pi$$

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

Result:

124.8584073464...

124.858407…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

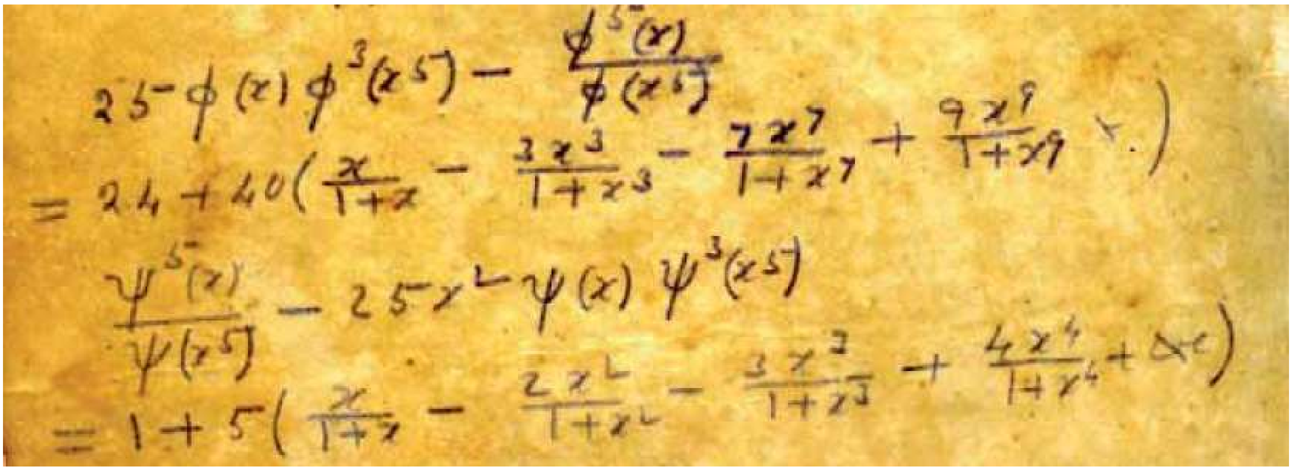
$$\frac{1}{2}\log_{0.9933690113422150000}\left(\frac{1}{4\left(1+\frac{2}{3}-\frac{2\times4}{1-4}-\frac{3\times8}{1+8}+\frac{4\times16}{1-16}+\frac{6\times2^6}{1-2^6}-\frac{7\times2^7}{1+2^7}-\frac{8\times2^8}{1-2^8}+\frac{9\times2^9}{1+2^9}\right)}\right)-\pi = -\pi+\frac{\log\left(\frac{1}{4\left(\frac{13}{3}+-\frac{64}{15}-\frac{24}{9}+\frac{6\times2^6}{1-2^6}-\frac{7\times2^7}{1+2^7}-\frac{8\times2^8}{1-2^8}+\frac{9\times2^9}{1+2^9}\right)}\right)}{2\log(0.9933690113422150000)}$$

Series representations:

$$\frac{1}{2}\log_{0.9933690113422150000}\left(\frac{1}{4\left(1+\frac{2}{3}-\frac{2\times 4}{1-4}-\frac{3\times 8}{1+8}+\frac{4\times 16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi = -\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{436\,669}{533\,892}\right)^k}{k}}{2\log(0.9933690113422150000)}$$

$$\frac{1}{2}\log_{0.9933690113422150000}\left(\frac{1}{4\left(1+\frac{2}{3}-\frac{2\times 4}{1-4}-\frac{3\times 8}{1+8}+\frac{4\times 16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi = -1.0000000000000000\,\pi-75.15353721054604\log\left(\frac{97\,223}{533\,892}\right)- 0.50000000000000000\log\left(\frac{97\,223}{533\,892}\right)\sum_{k=0}^{\infty}(-0.0066309886577850000)^k\,G(k)$$

$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$



$$25\phi(x)\phi^3(x^5) - \frac{\phi^5(x)}{\phi(x^5)} = 24 + 40\left(\frac{x}{1+x} - \frac{3x^3}{1+x^3} - \frac{7x^7}{1+x^7} + \frac{9x^9}{1+x^9} + \ldots\right)$$

$$\frac{\psi^5(x)}{\psi(x^5)} - 25x^2\psi(x)\psi^3(x^5) = 1 + 5\left(\frac{x}{1+x} - \frac{2x^2}{1+x^2} - \frac{3x^3}{1+x^3} + \frac{4x^4}{1+x^4} + \&c\right)$$

24+40(((2/3-24/9-(7*2^7)/(1+2^7)+(9*2^9)/(1+2^9)))

Input:

$$24 + 40\left(\frac{2}{3} - \frac{24}{9} - \frac{7\times 2^7}{1+2^7} + \frac{9\times 2^9}{1+2^9}\right)$$

Exact result:

$$\frac{20808}{817}$$

Decimal approximation:

25.46878824969400244798041615667074663402692778457772337821...

25.468788249...

((((24+40(((2/3-24/9-(7*2^7)/(1+2^7)+(9*2^9)/(1+2^9)))))))-3^2

Input:

$$\left(24 + 40\left(\frac{2}{3} - \frac{24}{9} - \frac{7\times 2^7}{1+2^7} + \frac{9\times 2^9}{1+2^9}\right)\right) - 3^2$$

Exact result:

$$\frac{13455}{817}$$

Decimal approximation:

16.46878824969400244798041615667074663402692778457772337821...

16.468788249.... result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

1/((((24+40(((2/3-24/9-(7*2^7)/(1+2^7)+(9*2^9)/(1+2^9)))))))^1/512

Input:

$$\frac{1}{\sqrt[512]{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}}$$

Result:

$$\frac{\sqrt[512]{817}}{2^{3/512}\ \sqrt[256]{51}}$$

Decimal approximation:

0.9936967972733390638115832009871459242576529957667236250 78...

0.993696797…. 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 dilaton value **0.989117352243** = $\boldsymbol{\phi}$

Alternate form:

$$\frac{1}{102}\sqrt[512]{817}\ 2^{509/512}\times 51^{255/256}$$

1/4*log base 0.993696797273339 (((1/((((24+40(((2/3-24/9-(7*2^7)/(1+2^7)+(9*2^9)/(1+2^9))))))))))-Pi

Input interpretation:

$$\frac{1}{4}\log_{0.993696797273339}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi$$

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

Result:

124.8584073464...

124.858407…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$\frac{1}{4}\log_{0.9936967972733390000}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi = -\pi+\frac{\log\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)}{4\log(0.9936967972733390000)}$$

Series representations:

$$\frac{1}{4}\log_{0.9936967972733390000}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi = -\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{19991}{20808}\right)^k}{k}}{4\log(0.9936967972733390000)}$$

$$\frac{1}{4}\log_{0.9936967972733390000}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi = -1.0000000000000000\,\pi-39.537376547490909\log\left(\frac{817}{20808}\right)-0.25000000000000000\log\left(\frac{817}{20808}\right)\sum_{k=0}^{\infty}(-0.0063032027266610000)^k\,G(k)$$

$$\text{for }\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

1+5(2/3-8/5-24/9+64/17)

Input:

$$1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)$$

Exact result:

$$\frac{31}{17}$$

Decimal approximation:

1.823529411764705882352941176470588235294117647058823529411...

1.82352941176...

(((1+5(2/3-8/5-24/9+64/17))))*3^2

Input:

$$\left(1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)\right)\times 3^2$$

Exact result:

$$\frac{279}{17}$$

Decimal approximation:

16.41176470588235294117647058823529411764705882352941176470...

16.411764705.... result very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

1/(((1+5(2/3-8/5-24/9+64/17))))^1/64

Input:

$$\frac{1}{\sqrt[64]{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}}$$

Result:

$$\sqrt[64]{\frac{17}{31}}$$

Decimal approximation:

0.990656829636629644428697934707978356729510518855688643804...

0.99065682963…. 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 dilaton value **0.989117352243** = $\boldsymbol{\phi}$

Alternate form:

$$\frac{1}{31}\sqrt[64]{17}\; 31^{63/64}$$

2*log base 0.9906568296366 ((1/(((1+5(2/3-8/5-24/9+64/17))))))-Pi

Input interpretation:

$$2 \log_{0.9906568296366}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi$$

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

Result:

124.85840735...

124.858407…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$2 \log_{0.99065682963660000}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi = -\pi + \frac{2 \log\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)}{\log(0.99065682963660000)}$$

Series representations:

$$2\log_{0.990656829636600000}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi = -\pi - \frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{14}{31}\right)^k}{k}}{\log(0.990656829636600000)}$$

$$2\log_{0.990656829636600000}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi =$$
$$-1.00000000000000\,\pi - 213.060101893743\log\left(\frac{17}{31}\right) -$$
$$2.00000000000000\log\left(\frac{17}{31}\right)\sum_{k=0}^{\infty}(-0.00934317036340000)^k\,G(k)$$
$$\text{for }\left(G(0)=0 \text{ and } G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

Note that all the four results concerning the value very near to the like-Higgs boson dilaton mass, are perfectly equals. These Ramanujan expressions, for x = 2, subtracting π and adding $1/\phi$ to them, provides ALWAYS the same result: 125.47644... Indeed :

8sqrt(((((log base 0.9909333004885 (((-(2/(1-2^2)-(2*4)/(1-2^4)-(3*8)/(1-2^6)+(4*16)/(1-2^8)+(6*2^6)/(1-2^12)))))))))))-Pi+1/golden ratio

Input interpretation:

$$8\sqrt{\log_{0.9909333004885}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.47644134...

125.47644... result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi+\frac{1}{\phi}=$$
$$-\pi+\frac{1}{\phi}+8\sqrt{\frac{\log\left(\frac{-2}{-3}+\frac{8}{1-2^4}+\frac{24}{1-2^6}-\frac{64}{1-2^8}-\frac{6\times 2^6}{1-2^{12}}\right)}{\log(0.99093330048850000)}}$$

Series representations:

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi+8\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{2993}{3315}\right)^k}{k}}{\log(0.99093330048850000)}}$$

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi+8\sqrt{-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)\right)^{-k}$$

$$8\sqrt{\log_{0.99093330048850000}\left(-\left(\frac{2}{1-2^2}-\frac{2\times 4}{1-2^4}-\frac{3\times 8}{1-2^6}+\frac{4\times 16}{1-2^8}+\frac{6\times 2^6}{1-2^{12}}\right)\right)}-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi+8\sqrt{-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+\log_{0.99093330048850000}\left(\frac{322}{3315}\right)\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

1/2*log base 0.993369011342215 (((1/[4((((1+2/3-2*4/(1-4)-3*8/(1+8)+4*16/(1-16)+(6*2^6)/(1-2^6)-(7*2^7)/(1+2^7)-(8*2^8)/(1-2^8)+(9*2^9)/(1+2^9))))]))))-Pi+1/golden ratio

Input interpretation:

$$\frac{1}{2}\log_{0.993369011342215}\left(\frac{1}{4\left(1+\frac{2}{3}-2\times\frac{4}{1-4}-3\times\frac{8}{1+8}+4\times\frac{16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.4764413352...

125.47644... result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$\frac{1}{2}\log_{0.993369011342215000}\left(\frac{1}{4\left(1+\frac{2}{3}-\frac{2\times 4}{1-4}-\frac{3\times 8}{1+8}+\frac{4\times 16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}=$$
$$-\pi+\frac{1}{\phi}+\frac{\log\left(\frac{1}{4\left(\frac{13}{3}+-\frac{64}{15}-\frac{24}{9}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)}{2\log(0.993369011342215000)}$$

Series representations:

$$\frac{1}{2}\log_{0.993369011342215000}\left(\frac{1}{4\left(1+\frac{2}{3}-\frac{2\times 4}{1-4}-\frac{3\times 8}{1+8}+\frac{4\times 16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{436669}{533892}\right)^k}{k}}{2\log(0.993369011342215000)}$$

$$\frac{1}{2}\log_{0.99336901134221500000}\left(\frac{1}{4\left(1+\frac{2}{3}-\frac{2\times 4}{1-4}-\frac{3\times 8}{1+8}+\frac{4\times 16}{1-16}+\frac{6\times 2^6}{1-2^6}-\frac{7\times 2^7}{1+2^7}-\frac{8\times 2^8}{1-2^8}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-1.0000000000000000\,\pi-75.15353721054604\log\left(\frac{97\,223}{533\,892}\right)-\frac{1}{2}\log\left(\frac{97\,223}{533\,892}\right)\sum_{k=0}^{\infty}(-0.0066309886577850000)^k\,G(k)$$

$$\text{for }\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

1/4*log base 0.993696797273339 (((1/((((24+40(((2/3-24/9-(7*2^7)/(1+2^7)+(9*2^9)/(1+2^9)))))))))))-Pi+1/golden ratio

Input interpretation:

$$\frac{1}{4}\log_{0.993696797273339}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.4764413352...

125.47644… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$\frac{1}{4}\log_{0.99369679727333390000}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}=-\pi+\frac{1}{\phi}+\frac{\log\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)}{4\log(0.99369679727333390000)}$$

Series representations:

$$\frac{1}{4}\log_{0.993696797272733390000}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{19991}{20808}\right)^k}{k}}{4\log(0.993696797272733390000)}$$

$$\frac{1}{4}\log_{0.993696797272733390000}\left(\frac{1}{24+40\left(\frac{2}{3}-\frac{24}{9}-\frac{7\times 2^7}{1+2^7}+\frac{9\times 2^9}{1+2^9}\right)}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-1.0000000000000000\,\pi-39.537376547490909\log\left(\frac{817}{20808}\right)-\frac{1}{4}\log\left(\frac{817}{20808}\right)\sum_{k=0}^{\infty}(-0.0063032027266610000)^k\,G(k)$$

$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

2*log base 0.9906568296366 ((1/(((1+5(2/3-8/5-24/9+64/17))))))-Pi+1/golden ratio

Input interpretation:

$$2\log_{0.9906568296366}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.47644133...

125.47644… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0

Alternative representation:

$$2\log_{0.99065682963660000}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+\frac{1}{\phi}+\frac{2\log\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)}{\log(0.99065682963660000)}$$

Series representations:

$$2\log_{0.99065682963660000}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{14}{31}\right)^k}{k}}{\log(0.99065682963660000)}$$

$$2\log_{0.99065682963660000}\left(\frac{1}{1+5\left(\frac{2}{3}-\frac{8}{5}-\frac{24}{9}+\frac{64}{17}\right)}\right)-\pi+\frac{1}{\phi}=\frac{1}{\phi}-1.00000000000000\,\pi-$$

$$213.060101893743\log\left(\frac{17}{31}\right)-2\log\left(\frac{17}{31}\right)\sum_{k=0}^{\infty}(-0.00934317036340000)^k\,G(k)$$

$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

Appendix

From:

Modular equations and approximations to π

Srinivasa Ramanujan - Quarterly Journal of Mathematics, XLV, 1914, 350 – 372

We note that:

$$g_{22} = \sqrt{(1+\sqrt{2})}.$$

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

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

Thence:

$$64g_{22}^{-24} = 4096e^{-\pi\sqrt{22}} + \cdots$$

And

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

That are connected with 64 and $4096 = 64^2$

Acknowledgments

I would like to thank Prof. **George E. Andrews** Evan Pugh Professor of Mathematics at Pennsylvania State University for his availability and kindness towards me

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