On some Ramanujan equations (mock theta functions and taxicab numbers) linked to various sectors of String Theory (Brane-World) and to the Black Hole Physics: Further new possible mathematical connections X.

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Abstract

In this research thesis, we have analyzed and deepened further Ramanujan expressions (mock theta functions and taxicab numbers) applied to some sectors of String Theory (Brane-World) and to the Black Hole Physics. We have therefore described other new possible mathematical connections.

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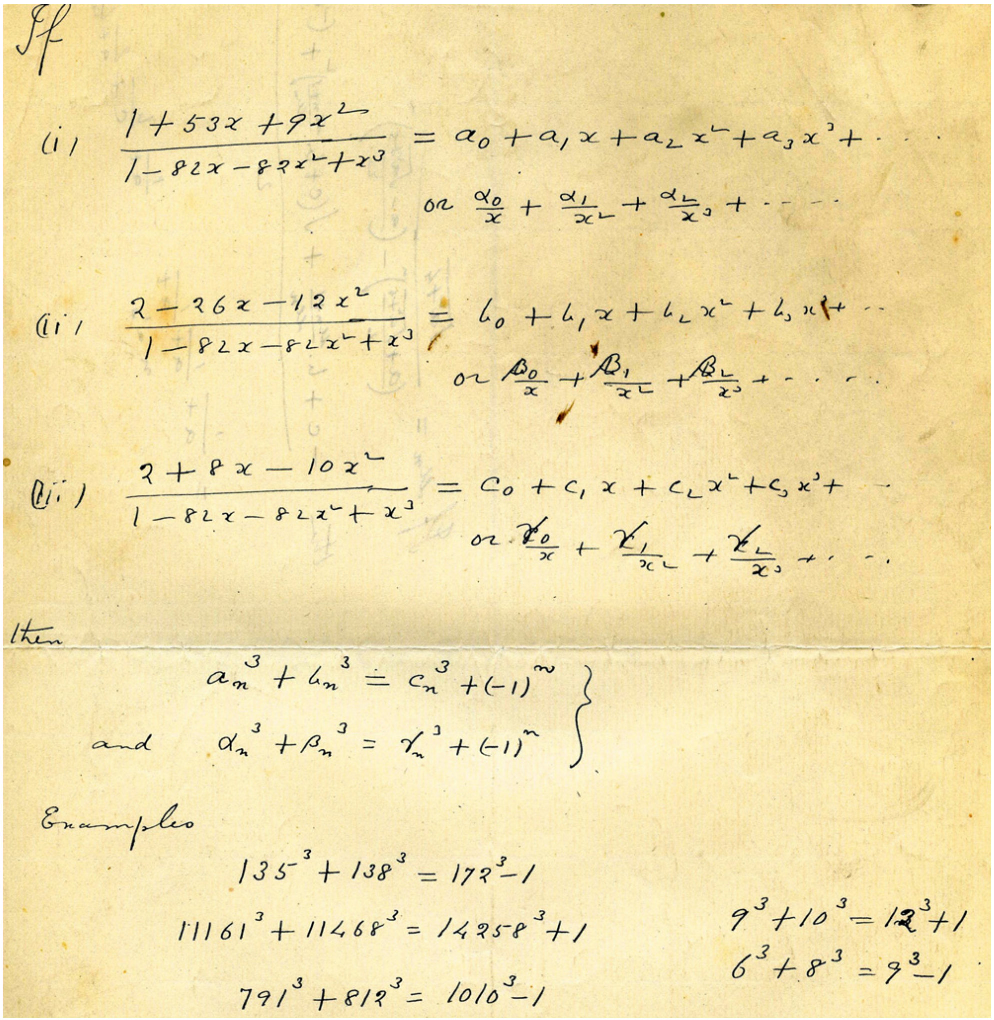
https://www.britannica.com/biography/Srinivasa-Ramanujan



If

(i) $$\frac{1+53x+9x^2}{1-82x-82x^2+x^3} = a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots$$
or $$\frac{\alpha_0}{x} + \frac{\alpha_1}{x^2} + \frac{\alpha_2}{x^3} + \cdots$$

(ii) $$\frac{2-26x-12x^2}{1-82x-82x^2+x^3} = b_0 + b_1x + b_2x^2 + b_3x^3 + \cdots$$
or $$\frac{\beta_0}{x} + \frac{\beta_1}{x^2} + \frac{\beta_2}{x^3} + \cdots$$

(iii) $$\frac{2+8x-10x^2}{1-82x-82x^2+x^3} = c_0 + c_1x + c_2x^2 + c_3x^3 + \cdots$$
or $$\frac{\gamma_0}{x} + \frac{\gamma_1}{x^2} + \frac{\gamma_2}{x^3} + \cdots$$

then

$$a_n^3 + b_n^3 = c_n^3 + (-1)^n$$
and $$\alpha_n^3 + \beta_n^3 = \gamma_n^3 + (-1)^n$$

Examples

$$135^3 + 138^3 = 172^3 - 1$$
$$11161^3 + 11468^3 = 14258^3 + 1$$
$$791^3 + 812^3 = 1010^3 - 1$$
$$9^3 + 10^3 = 12^3 + 1$$
$$6^3 + 8^3 = 9^3 - 1$$

https://plus.maths.org/content/ramanujan

Ramanujan's manuscript

The representations of 1729 as the sum of two cubes appear in the bottom right corner. The equation expressing the near counter examples to Fermat's last theorem appears further up: $\alpha^3 + \beta^3 = \gamma^3 + (-1)^n$.

From Wikipedia

*The **taxicab number**, typically denoted Ta(n) or Taxicab(n), also called the nth **Hardy–Ramanujan number**, is defined as the smallest integer that can be expressed as a sum of two positive integer cubes in n distinct ways. The most famous taxicab number is* $1729 = Ta(2) = 1^3 + 12^3 = 9^3 + 10^3$.

From

Stability of the graviton Bose-Einstein condensate in the brane-world
R. Casadio - Dipartimento di Fisica e Astronomia, Università di Bologna, via Irnerio 46, 40126 Bologna, Italy - INFN, Sezione di Bologna, viale B. Pichat 6, 40127 Bologna, Italy
Roldao da Rocha - CMCC, Universidade Federal do ABC, 09210-580, Santo André, SP, Brazil - arXiv: 1610.01572v1 [hep-th] 5 Oct 2016

Now, we have that:

$$\frac{B_\nu(\rho)}{B(\rho)} = 1 - \frac{2\,c_0}{\sigma\left[\rho - \frac{3}{4}\tanh^3(\nu\rho)\right]\left[5 - 3\tanh^2(\nu\rho)\right]}\,, \quad (22)$$

where $c_0 \simeq 0.275$. Fig. 1 shows plots of $B_\nu(\rho)$ for various values of ν. It is clear that, for increasing values of ν, this

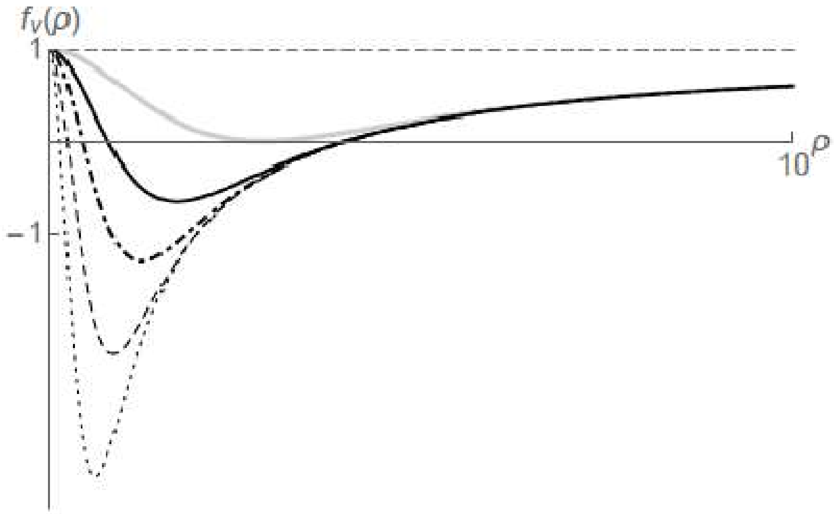


FIG. 1. Plot of $B_\nu(\rho)$ in Eq. (22), for $\nu = 0$ (gray dashed line); $\nu = 0.3$ (thick gray line); $\nu = 0.5$ (thick black line); $\nu = \nu_*$ (black dot-dashed line); $\nu = 1$ (black dashed line); $\nu = 1.4$ (dotted line).

black hole model rapidly approaches the Schwarzschild black hole. This figure can be compared to Fig. 1 in Ref. [19] for similar parameters.

For any ν, the metric component $B_\nu(\rho)$ has a single local minimum at $\rho_* = a_*/\nu$, where $a_* \approx 1.031$. Writing $B_\nu(\rho_*) = 1 - \nu/\nu_*$, with $\nu_* \approx 0.694$, the condition for the existence of an event horizon is $\nu > \nu_*$. The case $\nu = \nu_*$ is extremal [19].

$$\sigma \gtrsim 3.18 \times 10^6 \mathrm{MeV}^4$$

$$\sigma \gtrsim 5 \times 10^6 \ \mathrm{MeV}^4$$

$$\rho = r/M = 2\,r/r_s$$

For M = 1.312806e+40 and R = 1.949322e+13 (SMBH87 parameters)

$$\frac{B_\nu(\rho)}{B(\rho)} = 1 - \frac{2\,c_0}{\sigma[\rho - \frac{3}{4}\tanh^3(\nu\rho)][5 - 3\tanh^2(\nu\rho)]}\,, \quad (22)$$

1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40)))))]

Input interpretation:

$$1 - (2 \times 0.275) \Big/ \left(3.18 \times 10^6 \left(\frac{1.949322 \times 10^{13}}{1.312806 \times 10^{40}} - \frac{3}{4}\tanh^3\left(1.4 \times \frac{1.949322 \times 10^{13}}{1.312806 \times 10^{40}}\right)\right) \left(5 - 3\tanh^2\left(1.4 \times \frac{1.949322 \times 10^{13}}{1.312806 \times 10^{40}}\right)\right)\right)$$

tanh(x) is the hyperbolic tangent function

Result:

$-2.32961\ldots \times 10^{19}$

$-2.32961\ldots*10^{19}$

(((-1/((((1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40)))))])))))))^1/4096

Input interpretation:

$$\left(-\left(1 \Big/ \left(1 - (2 \times 0.275) \Big/ \left(3.18 \times 10^6 \left(\frac{1.949322 \times 10^{13}}{1.312806 \times 10^{40}} - \frac{3}{4}\tanh^3\left(1.4 \times \frac{1.949322 \times 10^{13}}{1.312806 \times 10^{40}}\right)\right) \left(5 - 3\tanh^2\left(1.4 \times \frac{1.949322 \times 10^{13}}{1.312806 \times 10^{40}}\right)\right)\right)\right)\right)\right) \wedge (1/4096)$$

tanh(x) is the hyperbolic tangent function

Result:

0.989171647...

0.989171647…. 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** = $\boldsymbol{\phi}$

2*sqrt((log base 0.989171647(((-1/((((1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40)))))])))))))

Input interpretation:

$$2\sqrt{\log_{0.989171647}\left(-\left(1/\left(1-(2\times 0.275)/\left(3.18\times 10^6\left(\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}-\frac{3}{4}\tanh^3\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\left(5-3\tanh^2\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\right)\right)\right)\right)}$$

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

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

Result:

128.0000...

128

27*sqrt((log base 0.989171647(((-1/((((1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40))))])))))))

Input interpretation:

$$27\sqrt{\log_{0.989171647}\left(-\left(1/\left(1-(2\times 0.275)/\left(3.18\times 10^6\left(\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}-\frac{3}{4}\tanh^3\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\left(5-3\tanh^2\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\right)\right)\right)\right)}$$

$\tanh(x)$ is the hyperbolic tangent function
$\log_b(x)$ is the base- b logarithm

Result:

1728.000...

1728

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

7+2*sqrt((log base 0.98917164(((-1/((((1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40))))])))))))

Input interpretation:

$$7+2\sqrt{\log_{0.98917164}\left(-\left(1/\left(1-(2\times 0.275)/\left(3.18\times 10^6\left(\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}-\frac{3}{4}\tanh^3\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\left(5-3\tanh^2\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\right)\right)\right)\right)}$$

$\tanh(x)$ is the hyperbolic tangent function
$\log_b(x)$ is the base- b logarithm

Result:

135.000...

135 (Ramanujan taxicab number)

7+3+2sqrt((log base 0.9891716(((-1/((((1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40)))))]))))))))

Input interpretation:

$$7+3+2\sqrt{\log_{0.9891716}\left(-\left(1\Big/\left(1-(2\times 0.275)\Big/\left(3.18\times 10^{6}\left(\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}-\frac{3}{4}\tanh^{3}\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\left(5-3\tanh^{2}\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\right)\right)\right)\right)}$$

tanh(x) is the hyperbolic tangent function

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

Result:

138.000...

138 (Ramanujan taxicab number)

4*11+2sqrt[log base 0.9891716(((-1/((((1-(2*0.275)/[(3.18*10^6)((((1.949322e+13/1.312806e+40)-3/4 tanh^3(1.4*(1.949322e+13/1.312806e+40)))))*(((5-3*tanh^2(1.4*(1.949322e+13/1.312806e+40)))))])))))))]

Input interpretation:

$$4\times 11+2\sqrt{\log_{0.9891716}\left(-\left(1\Big/\left(1-(2\times 0.275)\Big/\left(3.18\times 10^{6}\left(\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}-\frac{3}{4}\tanh^{3}\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\left(5-3\tanh^{2}\left(1.4\times\frac{1.949322\times 10^{13}}{1.312806\times 10^{40}}\right)\right)\right)\right)\right)\right)}$$

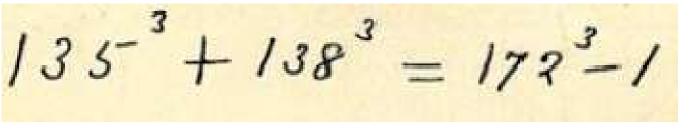
tanh(x) is the hyperbolic tangent function
$\log_b(x)$ is the base- b logarithm

Result:

172.000...

172 (Ramanujan taxicab number)

From



135^3+138^3 = 172^3-1

Input:

$135^3 + 138^3 = 172^3 - 1$

Result:

True

Left hand side:

$135^3 + 138^3 = 5\,088\,447$

Right hand side:

$172^3 - 1 = 5\,088\,447$

5088447

ln(135^3+138^3)

Input:

$\log(135^3 + 138^3)$

log(x) is the natural logarithm

Exact result:

$\log(5\,088\,447)$

Decimal approximation:

15.44248323391676327573091977987313063668255249261267663169...

15.4424832339…. result very near to the black hole entropy 15.6730

Property:

log(5 088 447) is a transcendental number

Alternate forms:

$3\log(3)+\log(188461)$

$3\log(3)+\log(7)+\log(13)+\log(19)+\log(109)$

Alternative representations:

$\log(135^3+138^3)=\log_e(135^3+138^3)$

$\log(135^3+138^3)=\log(a)\log_a(135^3+138^3)$

$\log(135^3+138^3)=-\mathrm{Li}_1(1-135^3-138^3)$

Integral representations:

$\log(135^3+138^3)=\int_1^{5088447}\frac{1}{t}\,dt$

$\log(135^3+138^3)=-\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{5088446^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$ for $-1<\gamma<0$

Pi*(135^3+138^3)^1/4-11+golden ratio

Input:

$\pi\sqrt[4]{135^3+138^3}-11+\phi$

ϕ is the golden ratio

Result:

$\phi-11+3^{3/4}\sqrt[4]{188461}\,\pi$

Decimal approximation:

139.8274348634976023813964821274141235673143122042902745354...

139.8274348… result practically equal to the rest mass of Pion meson 139.57 MeV

Property:

$-11+\phi+3^{3/4}\sqrt[4]{188461}\,\pi$ is a transcendental number

Alternate forms:

$$\frac{1}{2}\left(-21+\sqrt{5}+2\times 3^{3/4}\sqrt[4]{188461}\,\pi\right)$$

$$-\frac{21}{2}+\frac{\sqrt{5}}{2}+3^{3/4}\sqrt[4]{188461}\,\pi$$

$$-11+\frac{1}{2}\left(1+\sqrt{5}\right)+3^{3/4}\sqrt[4]{188461}\,\pi$$

Alternative representations:

$$\pi\sqrt[4]{135^3+138^3}-11+\phi=-11-2\cos(216\,°)+\pi\sqrt[4]{135^3+138^3}$$

$$\pi\sqrt[4]{135^3+138^3}-11+\phi=-11+2\cos\left(\frac{\pi}{5}\right)+\pi\sqrt[4]{135^3+138^3}$$

$$\pi\sqrt[4]{135^3+138^3}-11+\phi=-11-2\cos(216\,°)+180\,°\sqrt[4]{135^3+138^3}$$

Series representations:

$$\pi\sqrt[4]{135^3+138^3}-11+\phi=-\frac{21}{2}+\frac{\sqrt{5}}{2}+4\times 3^{3/4}\sqrt[4]{188461}\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\pi\sqrt[4]{135^3+138^3}-11+\phi=$$
$$-\frac{21}{2}+\frac{\sqrt{5}}{2}+\sum_{k=0}^{\infty}-\frac{4(-1)^k\,3^{3/4}\times 1195^{-1-2k}\sqrt[4]{188461}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}$$

$$\pi\sqrt[4]{135^3+138^3}-11+\phi=$$
$$-\frac{21}{2}+\frac{\sqrt{5}}{2}+3^{3/4}\sqrt[4]{188461}\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$\pi \sqrt[4]{135^3+138^3} - 11 + \phi = -\frac{21}{2} + \frac{\sqrt{5}}{2} + 4 \times 3^{3/4} \sqrt[4]{188461} \int_0^1 \sqrt{1-t^2}\, dt$$

$$\pi \sqrt[4]{135^3+138^3} - 11 + \phi = -\frac{21}{2} + \frac{\sqrt{5}}{2} + 2 \times 3^{3/4} \sqrt[4]{188461} \int_0^1 \frac{1}{\sqrt{1-t^2}}\, dt$$

$$\pi \sqrt[4]{135^3+138^3} - 11 + \phi = -\frac{21}{2} + \frac{\sqrt{5}}{2} + 2 \times 3^{3/4} \sqrt[4]{188461} \int_0^\infty \frac{1}{1+t^2}\, dt$$

Pi*(135^3+138^3)^1/4-29+4+golden ratio

Input:

$$\pi \sqrt[4]{135^3+138^3} - 29 + 4 + \phi$$

ϕ is the golden ratio

Result:

$$\phi - 25 + 3^{3/4} \sqrt[4]{188461}\, \pi$$

Decimal approximation:

125.82743486349760238139648212741412356731431220429027453540...

125.82743486… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Property:

$-25 + \phi + 3^{3/4} \sqrt[4]{188461}\, \pi$ is a transcendental number

Alternate forms:

$$\frac{1}{2}\left(-49 + \sqrt{5} + 2 \times 3^{3/4} \sqrt[4]{188461}\, \pi\right)$$

$$-\frac{49}{2} + \frac{\sqrt{5}}{2} + 3^{3/4} \sqrt[4]{188461}\, \pi$$

$$-25 + \frac{1}{2}\left(1 + \sqrt{5}\right) + 3^{3/4} \sqrt[4]{188461}\, \pi$$

Alternative representations:

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-25-2\cos(216\,°)+\pi\sqrt[4]{135^3+138^3}$$

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-25+2\cos\left(\frac{\pi}{5}\right)+\pi\sqrt[4]{135^3+138^3}$$

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-25-2\cos(216\,°)+180\,°\sqrt[4]{135^3+138^3}$$

Series representations:

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-\frac{49}{2}+\frac{\sqrt{5}}{2}+4\times 3^{3/4}\sqrt[4]{188461}\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=$$
$$-\frac{49}{2}+\frac{\sqrt{5}}{2}+\sum_{k=0}^{\infty}-\frac{4(-1)^k\,3^{3/4}\times 1195^{-1-2k}\sqrt[4]{188461}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}$$

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=$$
$$-\frac{49}{2}+\frac{\sqrt{5}}{2}+3^{3/4}\sqrt[4]{188461}\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-\frac{49}{2}+\frac{\sqrt{5}}{2}+4\times 3^{3/4}\sqrt[4]{188461}\int_0^1\sqrt{1-t^2}\,dt$$

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-\frac{49}{2}+\frac{\sqrt{5}}{2}+2\times 3^{3/4}\sqrt[4]{188461}\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$\pi\sqrt[4]{135^3+138^3}-29+4+\phi=-\frac{49}{2}+\frac{\sqrt{5}}{2}+2\times 3^{3/4}\sqrt[4]{188461}\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

We have also:

(135^3+138^3)^1/31

Input:

$$\sqrt[31]{135^3 + 138^3}$$

Result:

$$3^{3/31} \sqrt[31]{188461}$$

Decimal approximation:

1.645665103021282483289882047076548993334552545217523451761...

1.645665103….. ≈ ζ(2) = $\frac{\pi^2}{6}$ = 1.644934 ...

Alternate form:

root of $x^{31} - 5088447$ near $x = 1.64567$

Now, we have:

$$f_R^* = \frac{4}{49\pi}\left[\frac{80\arctan(y^{1/2})}{(1+y)^2(3y+1)y^{1/2}} + \frac{3y^4 + 41y^3 + 25y^2 - 589y - 240}{3(1+y)^4(\mathbf{1}+3y)}\right]$$

$$c \simeq 0.275/R^2.$$

$$y = cR^2$$

y = 0.275

4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275))

Input:

$$\frac{4}{49\pi}\left(\frac{80\tan^{-1}(\sqrt{0.275})}{(1+0.275)^2 (3\times 0.275+1)\sqrt{0.275}} + \frac{3\times 0.275^4 + 41\times 0.275^3 + 25\times 0.275^2 - 589\times 0.275 - 240}{3(1+0.275)^4 (1+3\times 0.275)}\right)$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

−0.0716284...

(result in radians)

-0.0716284…

Alternative representations:

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}=\frac{4\left(\frac{80\,\text{sc}^{-1}\left(\sqrt{0.275}\,|0\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}=\frac{4\left(\frac{80\tan^{-1}\left(1,\sqrt{0.275}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}=\frac{4\left(\frac{80\cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}$$

Series representations:

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}=-\frac{2.2524}{\pi}+\frac{4.19763\sum_{k=0}^{\infty}\frac{(-1)^k\,0.524404^{1+2k}}{1+2k}}{\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$-\frac{2.2524}{\pi}+\frac{4.19763\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 1.04881^{1+2k}F_{1+2k}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k}}{1+2k}}{\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$-\frac{2.2524}{\pi}+\frac{2.09882\,i\log(2)}{\pi}-\frac{2.09882\,i\log(-i(-0.524404+i))}{\pi}-\frac{2.09882\,i\sum_{k=1}^{\infty}\frac{0.5^k(-i(-0.524404+i))^k}{k}}{\pi}$$

F_n is the n^{th} Fibonacci number

$\log(x)$ is the natural logarithm

i is the imaginary unit

Integral representations:

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$-\frac{2.2524}{\pi}+\frac{2.20126}{\pi}\int_0^1\frac{1}{1+0.275\,t^2}\,dt$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$-\frac{2.2524}{\pi}-\frac{0.550314\,i}{\pi^{5/2}}\int_{-i\infty+\gamma}^{i\infty+\gamma}e^{-0.242946\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$-\frac{2.2524}{\pi}+\frac{0.550314}{i\,\pi^2}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{1.29098\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds\quad\text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$\frac{4\left(-27.5919+\frac{26.9654}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275k^2}{1+2k}}\right)}{49\pi}=\frac{4\left(-27.5919+\frac{26.9654}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}\right)}{49\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$\frac{4\left(-27.5919+\frac{26.9654}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275(1-2k)^2}{1.275+1.45k}}\right)}{49\pi}=\frac{4\left(-27.5919+\frac{26.9654}{1+\frac{0.275}{2.725+\frac{2.475}{4.175+\frac{6.875}{5.625+\frac{13.475}{7.075+\dots}}}}}\right)}{49\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}=$$

$$\frac{-0.0511429-\frac{0.605346}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}}{\pi}=\frac{-0.0511429-\frac{0.605346}{3+\frac{2.475}{5+\frac{1.1}{7+\frac{6.875}{9+\frac{4.4}{11+\dots}}}}}}{\pi}$$

$$\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\,\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)4}{49\,\pi}=$$

$$\frac{4\left(-27.5919+\frac{26.9654}{1.275+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.55\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.1375+0.1375\,(-1)^k\right)(1+2\,k)}}\right)}{49\,\pi}=$$

$$\frac{4\left(-27.5919+\frac{26.9654}{1.275+-\frac{0.55}{3-\frac{0.55}{6.375-\frac{3.3}{7-\frac{3.3}{11.475+\ldots}}}}}\right)}{49\,\pi}$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}} a_k/b_k$ is a continued fraction

-128/((((4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275)))))))-55-3

Input:

$$-\frac{128}{\frac{4}{49\,\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\,\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)}-55-3$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

1729.00...

(result in radians)

1729

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

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

Alternative representations:

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-55-3=$$

$$-58-\frac{128}{\frac{4\left(\frac{80\,\mathrm{sc}^{-1}\left(\sqrt{0.275}\,|\,0\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-55-3=$$

$$-58-\frac{128}{\frac{4\left(\frac{80\tan^{-1}\left(1,\sqrt{0.275}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-55-3=$$

$$-58-\frac{128}{\frac{4\left(\frac{80\cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}$$

Series representations:

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-55-3=$$

$$-58-\frac{30.4934\,\pi}{-0.536588+\sum_{k=0}^{\infty}\frac{(-1)^k\,0.524404^{1+2k}}{1+2k}}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-55-3=$$

$$-58-\frac{30.4934\,\pi}{-0.536588+\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 1.04881^{1+2k}F_{1+2k}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k}}{1+2k}}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-55-3=$$

$$-58+(30.4934\,\pi)\Big/\left(0.536588-\tan^{-1}(x)+\pi\left\lfloor\frac{\arg(i(-0.524404+x))}{2\pi}\right\rfloor-0.5\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-x)^{-k}+(i-x)^{-k}\right)(0.524404-x)^k}{k}\right)\ \text{for } (i\,x\in\mathbb{R} \text{ and } i\,x>1)$$

F_n is the n^{th} Fibonacci number

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

$\mathbb{R}$ is the set of real numbers

Integral representations:

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-55-3=$$

$$-58+\frac{58.1486\,\pi}{1.02323-\int_0^1\frac{1}{1+0.275\,t^2}\,dt}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-55-3=$$

$$-58+\frac{1568\,\pi}{27.5919+\frac{6.74135\,i}{\pi^{3/2}}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}e^{-0.242946\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds}\ \text{for } 0<\gamma<\frac{1}{2}$$

$$-\frac{128}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^{\frac{4}{49\pi}}}-55-3=$$

$$-58+\frac{56.8283\,i\,\pi^2}{i\,\pi-0.244324\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{1.29098\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\quad\text{for }0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-\frac{128}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^{\frac{4}{49\pi}}}-55-3=$$

$$-58+\frac{1568\,\pi}{27.5919-\frac{26.9654}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\,k^2}{1+2\,k}}}=-58+\frac{1568\,\pi}{27.5919-\frac{26.9654}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}}$$

$$-\frac{128}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^{\frac{4}{49\pi}}}-55-3=$$

$$-58-\frac{1568\,\pi}{-27.5919+\frac{26.9654}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\,(1-2\,k)^2}{1.275+1.45\,k}}}=$$

$$-58-\frac{1568\,\pi}{-27.5919+\frac{26.9654}{1+\frac{0.275}{2.725+\frac{2.475}{4.175+\frac{6.875}{5.625+\frac{13.475}{7.075+\dots}}}}}}$$

$$-\frac{128}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^{\frac{4}{49\pi}}}-55-3=$$

$$-58-\frac{1568\,\pi}{-0.6265-\frac{7.41548}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\left(1+(-1)^{1+k}+k\right)^2}{3+2\,k}}}=-58-\frac{1568\,\pi}{-0.6265-\frac{7.41548}{3+\frac{2.475}{5+\frac{1.1}{7+\frac{6.875}{9+\frac{4.4}{11+\dots}}}}}}$$

$$-\frac{128}{\frac{4}{49\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)}-55-3=$$

$$-58-\frac{1568\pi}{-27.5919+\frac{26.9654}{1.275+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.55\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.1375+0.1375(-1)^k\right)(1+2k)}}}=$$

$$-58-\frac{1568\pi}{-27.5919+\frac{26.9654}{1.275+-\frac{0.55}{3-\frac{0.55}{6.375-\frac{3.3}{7-\frac{3.3}{11.475+\ldots}}}}}}$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}} a_k/b_k$ is a continued fraction

-128/((((4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275)))))))-Pi

Input:

$$-\frac{128}{\frac{4}{49\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)}-\pi$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

1783.86...

(result in radians)

1783.86… result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

Alternative representations:

$$-\frac{128}{\frac{\left(\frac{80 \tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2 (3 \times 0.275+1) \sqrt{0.275}}+\frac{3 \times 0.275^4+41 \times 0.275^3+25 \times 0.275^2-589 \times 0.275-240}{3 (1+0.275)^4 (1+3 \times 0.275)}\right) 4}{49 \pi}}-\pi = -\pi-\frac{128}{\frac{4 \left(\frac{80 \operatorname{sc}^{-1}\left(\sqrt{0.275} \mid 0\right)}{1.825 \sqrt{0.275}\, 1.275^2}+\frac{-401.975+25 \times 0.275^2+41 \times 0.275^3+3 \times 0.275^4}{5.475 \times 1.275^4}\right)}{49 \pi}}$$

$$-\frac{128}{\frac{\left(\frac{80 \tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2 (3 \times 0.275+1) \sqrt{0.275}}+\frac{3 \times 0.275^4+41 \times 0.275^3+25 \times 0.275^2-589 \times 0.275-240}{3 (1+0.275)^4 (1+3 \times 0.275)}\right) 4}{49 \pi}}-\pi = -\pi-\frac{128}{\frac{4 \left(\frac{80 \tan^{-1}\left(1, \sqrt{0.275}\right)}{1.825 \sqrt{0.275}\, 1.275^2}+\frac{-401.975+25 \times 0.275^2+41 \times 0.275^3+3 \times 0.275^4}{5.475 \times 1.275^4}\right)}{49 \pi}}$$

$$-\frac{128}{\frac{\left(\frac{80 \tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2 (3 \times 0.275+1) \sqrt{0.275}}+\frac{3 \times 0.275^4+41 \times 0.275^3+25 \times 0.275^2-589 \times 0.275-240}{3 (1+0.275)^4 (1+3 \times 0.275)}\right) 4}{49 \pi}}-\pi = -\pi-\frac{128}{\frac{4 \left(\frac{80 \cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825 \sqrt{0.275}\, 1.275^2}+\frac{-401.975+25 \times 0.275^2+41 \times 0.275^3+3 \times 0.275^4}{5.475 \times 1.275^4}\right)}{49 \pi}}$$

Series representations:

$$-\frac{128}{\frac{\left(\frac{80 \tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2 (3 \times 0.275+1) \sqrt{0.275}}+\frac{3 \times 0.275^4+41 \times 0.275^3+25 \times 0.275^2-589 \times 0.275-240}{3 (1+0.275)^4 (1+3 \times 0.275)}\right) 4}{49 \pi}}-\pi = -\pi-\frac{30.4934 \pi}{-0.536588+\sum_{k=0}^{\infty} \frac{(-1)^k 0.524404^{1+2 k}}{1+2 k}}$$

$$-\frac{128}{\frac{\left(\frac{80 \tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2 (3 \times 0.275+1) \sqrt{0.275}}+\frac{3 \times 0.275^4+41 \times 0.275^3+25 \times 0.275^2-589 \times 0.275-240}{3 (1+0.275)^4 (1+3 \times 0.275)}\right) 4}{49 \pi}}-\pi = -\pi-\frac{60.9868 \pi}{-1.07318+i \log(2)-i \log(-((-0.524404+i) i))-i \sum_{k=1}^{\infty} \frac{0.5^k (-((-0.524404+i) i))^k}{k}}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-\pi=$$

$$-\pi+\frac{60.9868\pi}{1.07318+i\log(2)-i\log(-(i(0.524404+i)))-i\sum_{k=1}^{\infty}\frac{0.5^k(-(i(0.524404+i)))^k}{k}}$$

Integral representations:

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-\pi=$$

$$-\pi-\frac{58.1486\pi}{-1.02323+\int_0^1\frac{1}{1+0.275t^2}\,dt}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-\pi=$$

$$-\pi-\frac{1568\pi}{-27.5919-\frac{6.74135i}{\pi^{3/2}}\int_{-i\infty+\gamma}^{i\infty+\gamma}1.275^{-s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)^2\,ds}\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-\pi=$$

$$-\pi+\frac{56.8283i\pi^2}{i\pi-0.244324\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{1.29098s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\quad\text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}-\pi=$$

$$\pi\left(-1+\frac{1568}{27.5919-\frac{26.9654}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275k^2}{1+2k}}}\right)=\pi\left(-1+\frac{1568}{27.5919-\frac{26.9654}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}}\right)$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)^4}{49\pi}}-\pi =$$

$$\pi\left(-1-\frac{1568}{-27.5919+\frac{26.9654}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275(1-2k)^2}{1.275+1.45k}}}\right)=$$

$$\pi\left(-1-\frac{1568}{-27.5919+\frac{26.9654}{1+\frac{0.275}{2.725+\frac{2.475}{4.175+\frac{6.875}{5.625+\frac{13.475}{7.075+\ldots}}}}}}\right)$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)^4}{49\pi}}-\pi =$$

$$\pi\left(-1-\frac{1568}{-0.6265-\frac{7.41548}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}}\right)=\pi\left(-1-\frac{1568}{-0.6265-\frac{7.41548}{3+\frac{2.475}{5+\frac{1.1}{7+\frac{6.875}{9+\frac{4.4}{11+\ldots}}}}}}\right)$$

$$-\frac{128}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)^4}{49\pi}}-\pi =$$

$$\pi\left(-1-\frac{1568}{-27.5919+\frac{26.9654}{1.275+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.55\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.1375+0.1375(-1)^k\right)(1+2k)}}}\right)=$$

$$\pi\left(-1-\frac{1568}{-27.5919+\frac{26.9654}{1.275+-\frac{0.55}{3-\frac{0.55}{6.375-\frac{3.3}{7-\frac{3.3}{11.475+\ldots}}}}}}\right)$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}} a_k / b_k$ is a continued fraction

-55/((((4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275)))))))-34-Pi-sqrt7

Input:

$$-\frac{55}{\frac{4}{49\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)}-34-\pi-\sqrt{7}$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

728.064...

(result in radians)

728.064… ≈ 728 (Ramanujan taxicab number)

Alternative representations:

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-34-\pi-\sqrt{7}=-34-\pi-\frac{55}{\frac{4\left(\frac{80\,\mathrm{sc}^{-1}\left(\sqrt{0.275}\,|\,0\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}-\sqrt{7}$$

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-34-\pi-\sqrt{7}=-34-\pi-\frac{55}{\frac{4\left(\frac{80\tan^{-1}\left(1,\sqrt{0.275}\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}-\sqrt{7}$$

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)4}{49\pi}}-34-\pi-$$

$$\sqrt{7}=-34-\pi-\frac{55}{\frac{4\left(\frac{80\cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}-\sqrt{7}$$

Series representations:

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)4}{49\pi}}-$$

$$34-\pi-\sqrt{7}=-34-\pi+\frac{13.1026\pi}{0.536588-\tan^{-1}(0.524404)}-$$

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

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-$$

$$34-\pi-\sqrt{7}=-\left(\left(-18.244+12.566\pi-0.536588\sqrt{6}\sum_{k=0}^{\infty}6^{-k}\binom{\frac{1}{2}}{k}+\right.\right.$$

$$34\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 1.04881^{1+2k}F_{1+2k}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k}}{1+2k}+$$

$$\pi\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 1.04881^{1+2k}F_{1+2k}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k}}{1+2k}+$$

$$\left.\sqrt{6}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^{k_2}1.04881^{1+2k_2}\times 6^{-k_1}\binom{\frac{1}{2}}{k_1}F_{1+2k_2}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k_2}}{1+2k_2}\right)\Bigg/$$

$$\left.\left(-0.536588+\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 1.04881^{1+2k}F_{1+2k}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k}}{1+2k}\right)\right)$$

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-$$

$$34-\pi-\sqrt{7}=$$

$$-34-\pi-(13.1026\pi)\Bigg/\left(-0.536588+\tan^{-1}(x)-\pi\left\lfloor\frac{\arg(i(-0.524404+x))}{2\pi}\right\rfloor+\right.$$

$$\left.0.5\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-x)^{-k}+(i-x)^{-k}\right)(0.524404-x)^k}{k}\right)-$$

$$\exp\left(i\pi\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(7-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

for ($i x \in \mathbb{R}$ and $i x > 1$ and $x \in \mathbb{R}$ and $x < 0$)

Integral representations:

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-34-\pi-\sqrt{7}=-34-\pi+\frac{24.9857\pi}{1.02323-\int_0^1\frac{1}{1+0.275t^2}\,dt}-\sqrt{7}$$

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-34-\pi-\sqrt{7}=-34-\pi+\frac{24.4184\pi^{5/2}}{\pi^{3/2}+0.244324\,i\int_{-i\infty+\gamma}^{i\infty+\gamma}e^{-0.242946s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds}-\sqrt{7}\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-34-\pi-\sqrt{7}=-34-\pi+\frac{24.4184\,i\pi^2}{i\pi-0.244324\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{1.29098s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}-\sqrt{7}\quad\text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-\frac{55}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-34-\pi-\sqrt{7}=-34+\pi\left(-1+\frac{2695}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275k^2}{1+2k}}}\right)-\sqrt{7}=$$

$$-34-\sqrt{7}+\pi\left(-1+\frac{2695}{110.368-\frac{107.862}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}}\right)$$

$$-\frac{55}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)^4}-$$

$$49\pi$$

$$34-\pi-\sqrt{7}=-41-\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{-42}{14}+\pi\left(-1+\frac{2695}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\,k^2}{1+2\,k}}}\right)=$$

$$-41--\frac{42}{14-\frac{42}{14-\frac{42}{14-\frac{42}{14+\ldots}}}}+\pi\left(-1+\frac{2695}{110.368-\frac{107.862}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\ldots}}}}}}\right)$$

$$-\frac{55}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)^4}-$$

$$49\pi$$

$$34-\pi-\sqrt{7}=-35-4\left(\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{3}{8}}{\frac{1}{2}}\right)+\pi\left(-1+\frac{2695}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\,k^2}{1+2\,k}}}\right)=$$

$$-35-4\,\frac{3}{8\left(\frac{1}{2}+\frac{3}{8\left(\frac{1}{2}+\frac{3}{8\left(\frac{1}{2}+\frac{3}{8\left(\frac{1}{2}+\ldots\right)}\right)}\right)}\right)}+\pi\left(-1+\frac{2695}{110.368-\frac{107.862}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\ldots}}}}}}\right)$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}} a_k/b_k$ is a continued fraction

-11/((((4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275)))))))-13-3+1/2

Input:

$$-\frac{11}{\frac{4}{49\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)}-13-3+\frac{1}{2}$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

138.070...

(result in radians)

138.070… ≈ 138 (Ramanujan taxicab number)

Alternative representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}-\frac{11}{\frac{4\left(\frac{80\,\mathrm{sc}^{-1}\left(\sqrt{0.275}\,|0\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}-\frac{11}{\frac{4\left(\frac{80\tan^{-1}\left(1,\sqrt{0.275}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+$$

$$\frac{1}{2}=-\frac{31}{2}-\frac{11}{\frac{4\left(\frac{80\cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

Series representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}-\frac{2.62053\pi}{-0.536588+\sum_{k=0}^{\infty}\frac{(-1)^k\,0.524404^{1+2k}}{1+2k}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=$$
$$-\frac{31}{2}-\frac{5.24105\pi}{-1.07318+i\log(2)-i\log(-((-0.524404+i)i))-i\sum_{k=1}^{\infty}\frac{0.5^k(-((-0.524404+i)i))^k}{k}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=$$
$$-\frac{31}{2}+\frac{5.24105\pi}{1.07318+i\log(2)-i\log(-(i(0.524404+i)))-i\sum_{k=1}^{\infty}\frac{0.5^k(-(i(0.524404+i)))^k}{k}}$$

Integral representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}+\frac{4.99715\pi}{1.02323-\int_0^1\frac{1}{1+0.275t^2}\,dt}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=$$

$$-\frac{31}{2}+\frac{4.88368\,\pi^{5/2}}{\pi^{3/2}+0.244324\,i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}e^{-0.242946\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,d\,s}\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}+\frac{4.88368\,i\,\pi^2}{i\,\pi-0.244324\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{1.29098\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,d\,s}\quad\text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\mathop{K}_{k=1}^{\infty}\frac{0.275\,k^2}{1+2\,k}}}=-\frac{31}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-3+\frac{1}{2}=-\frac{31}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\mathop{K}_{k=1}^{\infty}\frac{1.1\,(0.5-k)^2}{1.275+1.45\,k}}}=$$

$$-\frac{31}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\frac{0.275}{2.725+\frac{2.475}{4.175+\frac{6.875}{5.625+\frac{13.475}{7.075+\dots}}}}}}$$

$$-\frac{11}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)^4}-$$

$$49\pi$$

$$13-3+\frac{1}{2}=-\frac{31}{2}-\frac{539\pi}{4\left(-0.6265-\frac{7.41548}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}\right)}=$$

$$-\frac{31}{2}-\frac{539\pi}{4\left(-0.6265-\frac{7.41548}{3+\frac{2.475}{5+\frac{1.1}{7+\frac{6.875}{9+\frac{4.4}{11+\ldots}}}}}\right)}$$

$$-\frac{11}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)^4}-$$

$$49\pi$$

$$13-3+\frac{1}{2}=-\frac{31}{2}-\frac{539\pi}{4\left(-27.5919+\frac{26.9654}{1.275+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.55\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.1375+0.1375(-1)^k\right)(1+2k)}}\right)}=$$

$$-\frac{31}{2}-\frac{539\pi}{4\left(-27.5919+\frac{26.9654}{1.275+-\frac{0.55}{3-\frac{0.55}{6.375-\frac{3.3}{7-\frac{3.3}{11.475+\ldots}}}}}\right)}$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}} a_k/b_k$ is a continued fraction

-11/((((4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275)))))))-13-5-1/2

Input:

$$-\frac{11}{\frac{4}{49\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)}-13-5-\frac{1}{2}$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

135.070...

(result in radians)

135.070… ≈ 135 (Ramanujan taxicab number)

Alternative representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}-\frac{11}{\frac{4\left(\frac{80\,\mathrm{sc}^{-1}\left(\sqrt{0.275}\,|0\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3(1+0.275)^4(1+3\times 0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}-\frac{11}{\frac{4\left(\frac{80\tan^{-1}\left(1,\sqrt{0.275}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}-\frac{11}{\frac{4\left(\frac{80\cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}$$

Series representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}-\frac{2.62053\pi}{-0.536588+\sum_{k=0}^{\infty}\frac{(-1)^k\,0.524404^{1+2k}}{1+2k}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=$$
$$-\frac{37}{2}-\frac{5.24105\pi}{-1.07318+i\log(2)-i\log(-((-0.524404+i)\,i))-i\sum_{k=1}^{\infty}\frac{0.5^k\,(-((-0.524404+i)\,i))^k}{k}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=$$
$$-\frac{37}{2}+\frac{5.24105\pi}{1.07318+i\log(2)-i\log(-(i\,(0.524404+i)))-i\sum_{k=1}^{\infty}\frac{0.5^k\,(-(i\,(0.524404+i)))^k}{k}}$$

Integral representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}+\frac{4.99715\pi}{1.02323-\int_0^1\frac{1}{1+0.275t^2}\,dt}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=$$

$$-\frac{37}{2}+\frac{4.88368\,\pi^{5/2}}{\pi^{3/2}+0.244324\,i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}e^{-0.242946\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds}\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}+\frac{4.88368\,i\,\pi^2}{i\,\pi-0.244324\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{1.29098\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\quad\text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}+\frac{539\pi}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\,k^2}{1+2\,k}}}=-\frac{37}{2}+\frac{539\pi}{110.368-\frac{107.862}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}-13-5-\frac{1}{2}=-\frac{37}{2}+\frac{539\pi}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{1.1\,(0.5-k)^2}{1.275+1.45\,k}}}=$$

$$-\frac{37}{2}+\frac{539\pi}{110.368-\frac{107.862}{1+\frac{0.275}{2.725+\frac{2.475}{4.175+\frac{6.875}{5.625+\frac{13.475}{7.075+\dots}}}}}}$$

$$-\frac{11}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)4}-$$

$$49\pi$$

$$13-5-\frac{1}{2}=-\frac{37}{2}-\frac{539\pi}{4\left(-0.6265-\frac{7.41548}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}\right)}=$$

$$-\frac{37}{2}-\frac{539\pi}{4\left(-0.6265-\frac{7.41548}{3+\frac{2.475}{5+\frac{1.1}{7+\frac{6.875}{9+\frac{4.4}{11+\ldots}}}}}\right)}$$

$$-\frac{11}{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)4}-$$

$$49\pi$$

$$13-5-\frac{1}{2}=-\frac{37}{2}-\frac{539\pi}{4\left(-27.5919+\frac{26.9654}{1.275+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.55\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.1375+0.1375\,(-1)^k\right)(1+2k)}}\right)}=$$

$$-\frac{37}{2}-\frac{539\pi}{4\left(-27.5919+\frac{26.9654}{1.275+-\frac{0.55}{3-\frac{0.55}{6.375-\frac{3.3}{7-\frac{3.3}{11.475+\ldots}}}}}\right)}$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}}\, a_k / b_k$ is a continued fraction

-11/((((4/(49Pi)*(((80 atan(0.275^1/2)))/(((1+0.275)^2(3*0.275+1)0.275^1/2))+(3*0.275^4+41*0.275^3+25*0.275^2-589*0.275-240)/(3(1+0.275)^4(1+3*0.275)))))))+18+1/2

Input:

$$-\frac{11}{\frac{4}{49\pi}\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)}+18+\frac{1}{2}$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

172.0703082299606398136043749780507770604998554678811792291...

(result in radians)

172.070308… ≈ 172 (Ramanujan taxicab number)

Alternative representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)4}{49\pi}}+18+\frac{1}{2}=\frac{37}{2}-\frac{11}{\frac{4\left(\frac{80\,\mathrm{sc}^{-1}\left(\sqrt{0.275}\,\middle|\,0\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times 0.275+1)\sqrt{0.275}}+\frac{3\times 0.275^4+41\times 0.275^3+25\times 0.275^2-589\times 0.275-240}{3\,(1+0.275)^4\,(1+3\times 0.275)}\right)4}{49\pi}}+18+\frac{1}{2}=\frac{37}{2}-\frac{11}{\frac{4\left(\frac{80\tan^{-1}\left(1,\sqrt{0.275}\right)}{1.825\sqrt{0.275}\;1.275^2}+\frac{-401.975+25\times 0.275^2+41\times 0.275^3+3\times 0.275^4}{5.475\times 1.275^4}\right)}{49\pi}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}-\frac{11}{\frac{4\left(\frac{80\cot^{-1}\left(\frac{1}{\sqrt{0.275}}\right)}{1.825\sqrt{0.275}\,1.275^2}+\frac{-401.975+25\times0.275^2+41\times0.275^3+3\times0.275^4}{5.475\times1.275^4}\right)}{49\pi}}$$

Series representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}-\frac{2.62053\pi}{-0.536588+\sum_{k=0}^{\infty}\frac{(-1)^k 0.524404^{1+2k}}{1+2k}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}-\frac{2.62053\pi}{-0.536588+\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 1.04881^{1+2k}F_{1+2k}\left(\frac{1}{1+\sqrt{1.22}}\right)^{1+2k}}{1+2k}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}+(2.62053\pi)\Big/\left(0.536588-\tan^{-1}(x)+\pi\left\lfloor\frac{\arg(i(-0.524404+x))}{2\pi}\right\rfloor-0.5\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-x)^{-k}+(i-x)^{-k}\right)(0.524404-x)^k}{k}\right) \text{ for } (i x\in\mathbb{R} \text{ and } i x>1)$$

F_n is the n^{th} Fibonacci number

Integral representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}+\frac{4.99715\,\pi}{1.02323-\int_0^1\frac{1}{1+0.275\,t^2}\,dt}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}+\frac{4.88368\,\pi^{5/2}}{\pi^{3/2}+0.244324\,i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}e^{-0.242946\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds}\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}+\frac{4.88368\,i\,\pi^2}{i\,\pi-0.244324\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{1.29098\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\quad\text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\,k^2}{1+2\,k}}}=\frac{37}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\frac{0.275}{3+\frac{1.1}{5+\frac{2.475}{7+\frac{4.4}{9+\dots}}}}}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2(3\times0.275+1)\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3(1+0.275)^4(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{1.1\,(0.5-k)^2}{1.275+1.45\,k}}}=\frac{37}{2}+\frac{539\,\pi}{110.368-\frac{107.862}{1+\frac{0.275}{2.725+\frac{2.475}{4.175+\frac{6.875}{5.625+\frac{13.475}{7.075+\dots}}}}}}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\,\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}-\frac{539\pi}{4\left(-0.6265-\frac{7.41548}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.275\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}\right)}=\frac{37}{2}-\frac{539\pi}{4\left(-0.6265-\frac{7.41548}{3+\frac{2.475}{5+\frac{1.1}{7+\frac{6.875}{9+\frac{4.4}{11+\ldots}}}}}\right)}$$

$$-\frac{11}{\frac{\left(\frac{80\tan^{-1}\left(\sqrt{0.275}\right)}{(1+0.275)^2\,(3\times0.275+1)\,\sqrt{0.275}}+\frac{3\times0.275^4+41\times0.275^3+25\times0.275^2-589\times0.275-240}{3\,(1+0.275)^4\,(1+3\times0.275)}\right)^4}{49\pi}}+18+\frac{1}{2}=$$

$$\frac{37}{2}-\frac{539\pi}{4\left(-27.5919+\frac{26.9654}{1.275+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.55\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.1375+0.1375\,(-1)^k\right)(1+2k)}}\right)}=$$

$$\frac{37}{2}-\frac{539\pi}{4\left(-27.5919+\frac{26.9654}{1.275+-\frac{0.55}{3-\frac{0.55}{6.375-\frac{3.3}{7-\frac{3.3}{11.475+\ldots}}}}}\right)}$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}}\, a_k/b_k$ is a continued fraction

From:

Holographic entanglement entropy under the minimal geometric deformation and extensions
R. da Rocha, A. A. Tomaz - arXiv:1905.01548v2 [hep-th] 29 Dec 2019

Now, we have that:

for $\kappa_1 = \dfrac{M\chi}{1-M/R}$. Now, in order to the radial metric component asymptotically approach the Schwarzschild behavior with ADM mass $\mathbb{M}_1 = 2M$, $e^{-\lambda(r)} \sim 1-\frac{2\mathbb{M}_1}{r}+\mathcal{O}(r^{-2})$, one must necessarily have $\kappa_1 = -2M$. In this case, the temporal and spatial components of the metric will be inversely equal to each other (as it is the case of the Schwarzschild solution), containing a tidal charge $\mathbb{Q}_1 = 4M^2$ reproducing a solution that is tidally charged by the Weyl fluid [45]:

$$e^{\nu} = e^{-\lambda} = 1 - \frac{2\mathbb{M}_1}{r} + \frac{\mathbb{Q}_1}{r^2} \tag{14}$$

It is worth to emphasize that the metric of Eq. (14) has a degenerate event horizon at $r_h = 2M = \mathbb{M}_1$. Since the degenerate horizon lies behind the Schwarzschild event horizon, $r_h = \mathbb{M}_1 < r_s = 2\mathbb{M}_1$, bulk effects are then responsible for decreasing the gravitational field strength on the brane.

Now the exterior solution for $k = 2$ can be constructed, making Eq. (12) to yield

$$e^{\nu(r)} = 1 - \frac{2\mathbb{M}_2}{r} + \frac{\mathbb{Q}_2}{r^2} - \frac{2\mathbb{Q}_2\mathbb{M}_2}{9r^3}\ , \tag{15}$$

where $\mathbb{Q}_2 = 12M^2$ and $\mathbb{M}_2 = 3M$. The radial component, on the other hand, reads

$$e^{-\lambda(r)} = \frac{1}{1-\frac{2\mathbb{M}_2}{3r}} \sum_{m=0}^{8} \frac{c_m}{r^m}\ , \tag{16}$$

where the coefficients $c_m \equiv c_m(\mathbb{M}_2, \mathbb{Q}_2, \mathrm{s})$ are

$$c_0 = 1\ , \qquad c_1 = \mathrm{s} - \frac{4\mathbb{M}_2}{3}\ , \qquad c_2 = \frac{1}{6}\left(5\mathbb{Q}_2 - 7\mathrm{s}\mathbb{M}_2\right)\ , \tag{17a}$$

$$c_3 = \frac{\mathbb{M}_2}{12}(7\mathrm{s}\mathbb{M}_2 - 5\mathbb{Q}_2)\ ,\ c_4 = \frac{25\mathbb{Q}_2^2}{288} - \frac{7}{216}\mathrm{s}\mathbb{M}_2^3\ ,\ c_5 = \frac{35}{1296}\mathrm{s}\mathbb{M}_2^4 - \frac{35}{1728}\mathbb{Q}_2^2\mathbb{M}_2, \tag{17b}$$

$$c_6 = \frac{5\mathbb{Q}_2^3}{20736} - \frac{7\mathrm{s}\mathbb{M}_2^5}{2592}\ , \quad c_7 = \frac{28\mathrm{s}\mathbb{M}_2^6 - 15\mathbb{Q}_2^3\mathbb{M}_2}{186624}\ , \ c_8 = \frac{5\mathbb{Q}_2^4}{4644864} - \frac{\mathrm{s}\mathbb{M}_2^7}{279936}, \tag{17c}$$

and $\mathrm{s} = R\chi\,(1 - 2\mathbb{M}_2/3R)\,/\,(2 - \mathbb{M}_2/3R)^7$. The asymptotic Schwarzschild behavior is then assured when $\mathrm{s} = -\mathbb{M}_2/96$. In this case, the degenerate event horizon is at $r_e \approx 1.12\mathbb{M}_2$ [5]. Hence, the bulk Weyl fluid weakens gravitational field effects. The classical tests of GR applied to the EMGD metric provide the following constraints on the value of the deformation parameter, $k \lesssim 4.2$ for the gravitational redshift of light. The standard MGD corresponds to $k = 0$, whereas the Reissner–Nordström solution represents the $k = 1$ case with the ADM mass $\mathbb{M}_1$, instead.

For $M = 1.312806\text{e}{+40}$

$\mathbb{Q}_2 = 12M^2$ and $\mathbb{M}_2 = 3M$.

(-3*1.312806e+40)/96

Result:

$-4.10251875 \times 10^{38}$

$-4.10251875*10^{38} = s$

Thence:

$$c_1 = s - \frac{4M_2}{3} \, ,$$

-4.10251875e+38-(4*3*1.312806e+40)/3

Input interpretation:

$$-4.10251875 \times 10^{38} - \frac{1}{3}(4 \times 3 \times 1.312806 \times 10^{40})$$

Result:

$-5.2922491875 \times 10^{40}$

$-5.2922491875*10^{40}$

$$c_2 = \frac{1}{6}(5Q_2 - 7sM_2)$$

1/6*(((5*12*1.312806e+40^2 - 7*(-4.10251875e+38)*3*1.312806e+40)))

Input interpretation:

$$\frac{1}{6}(5 \times 12 (1.312806 \times 10^{40})^2 - 7(-4.10251875 \times 10^{38}) \times 3 \times 1.312806 \times 10^{40})$$

Result:

1 742 309 932 941 393 750 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Scientific notation:

$1.74230993294139375 \times 10^{81}$

$1.74230993294139375*10^{81}$

$$c_3 = \frac{M_2}{12}(7sM_2 - 5Q_2)$$

(3*1.312806e+40)/12*(((7*(-4.10251875e+38)*3*1.312806e+40)-(5*12*1.312806e+40^2)))

Input interpretation:

$$\left(\frac{1}{12}\left(3\times 1.312806\times 10^{40}\right)\right)\left(7\left(-4.10251875\times 10^{38}\right)\times 3\times 1.312806\times 10^{40}-5\times 12\left(1.312806\times 10^{40}\right)^2\right)$$

Result:

−34 309 724 007 375 890 450 437 500 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Result:

$-3.43097240073758904504375\times 10^{121}$

$-3.43097240073758904504375*10^{121}$

We note that:

-1/(-3.43097240073758904504375*10^121)

Input interpretation:

$$\frac{-1}{-\left(3.43097240073758904504375\times 10^{121}\right)}$$

Result:

$2.914625602307440329550301955454831693427965914286452\ldots\times 10^{-122}$

$2.9146256....*10^{-122}$ result very near to the value of Cosmological Constant in Planck units $2.888 * 10^{-122}$

$$c_4=\frac{25\mathbb{Q}_2^2}{288}-\frac{7}{216}\mathrm{s}\mathbb{M}_2^3$$

For M = 1.312806e+40

$\mathbb{Q}_2=12M^2$ and $\mathbb{M}_2=3M$.

$-4.10251875*10^{38} = s$

(25*(12*1.312806e+40^2)^2)/288 – 7/216 *(-4.10251875e+38)*(3*1.312806e+40)^3

Input interpretation:

$$\frac{1}{288}\left(25\left(12\left(1.312806\times10^{40}\right)^2\right)^2\right)-\frac{7}{216}\left(-4.10251875\times10^{38}\right)\left(3\times1.312806\times10^{40}\right)^3$$

Result:

3.72101×10^{161}

Scientific notation:

$3.7210131631497514723451135437 5\times10^{161}$

$3.72101*10^{161}$

$$c_5=\frac{35}{1296}s\mathbb{M}_2^4-\frac{35}{1728}\mathbb{Q}_2^2\mathbb{M}_2$$

35/1296 *(-4.10251875e+38)*(3*1.312806e+40)^4 – 35/1728 * (12*1.312806e+40^2)^2*(3*1.312806e+40)

Input interpretation:

$$\frac{35}{1296}\left(-4.10251875\times10^{38}\right)\left(3\times1.312806\times10^{40}\right)^4-\frac{35}{1728}\left(12\left(1.312806\times10^{40}\right)^2\right)^2\left(3\times1.312806\times10^{40}\right)$$

Result:

−3 438 670 463 997 319 368 691 424 785 794 656 250 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Input interpretation:

$$\frac{35}{1296}\left(-4.10251875\times10^{38}\right)\left(3\times1.312806\times10^{40}\right)^4-\frac{35}{1728}\left(12\left(1.312806\times10^{40}\right)^2\right)^2\left(3\times1.312806\times10^{40}\right)=-\left(3.438670463997\times10^{201}\right)$$

Result:

True

-3.438670463997*10^{201}

Note that:

35/1296 *(-4.10251875e+38)*(3*1.312806e+40)^4 – 35/x * (12*1.312806e+40^2)^2*(3*1.312806e+40) = -3.438670463997*10^201

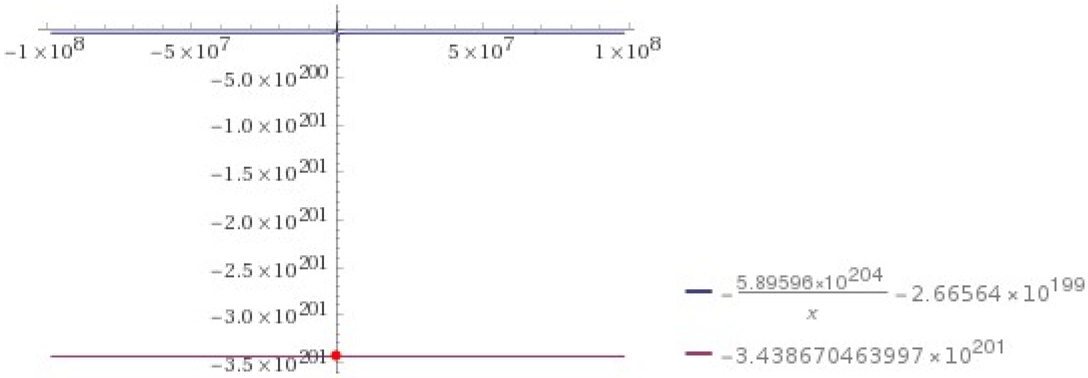
Input interpretation:

$$\frac{35}{1296}\left(-4.10251875\times10^{38}\right)\left(3\times1.312806\times10^{40}\right)^4 - \frac{35}{x}\left(12\left(1.312806\times10^{40}\right)^2\right)^2\left(3\times1.312806\times10^{40}\right) = -\left(3.438670463997\times10^{201}\right)$$

Result:

$$-\frac{5.89596\times10^{204}}{x} - 2.66564\times10^{199} = -3.438670463997\times10^{201}$$

Plot:



Alternate form assuming x is real:

$$\frac{5.89596\times10^{204}}{x} = 3.41201\times10^{201}$$

Alternate form:

$$\frac{-2.66564\times10^{199}\,x - 5.89596\times10^{204}}{x} = -3.438670463997\times10^{201}$$

Alternate form assuming x is positive:

$3.41201\times10^{201}\,x = 5.89596\times10^{204}$ (for $x \neq 0$)

Solution:

$x \approx 1728.$

1728

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

$$c_6 = \frac{5\mathbb{Q}_2^3}{20736} - \frac{7s\mathbb{M}_2^5}{2592}$$

For M = 1.312806e+40

$$\mathbb{Q}_2 = 12M^2 \text{ and } \mathbb{M}_2 = 3M.$$

-4.10251875e+38 = s

(for this expression, we have considered $12M^2 = 12M$)

5/20736*(12*1.312806e+40)^3-7/2592*(-4.10251875e+38)*(3*1.312806e+40)^5

Input interpretation:

$$\frac{5}{20\,736}(12\times 1.312806\times 10^{40})^3 - \frac{7}{2592}(-4.10251875\times 10^{38})(3\times 1.312806\times 10^{40})^5$$

Result:

1.04984×10^{239}

$1.04984*10^{239}$

Scientific notation:

$1.0498388877112708956126313040325440681250000000000000\ldots \times 10^{239}$

$$c_7 = \frac{28sM_2^6 - 15Q_2^3M_2}{186624}$$

((28*(-4.10251875e+38)*(3*1.312806e+40)^6-15*(12*1.312806e+40^2)^3*(3*1.312806e+40)))*1/186624

Input interpretation:

$$\left(28\left(-4.10251875\times10^{38}\right)\left(3\times1.312806\times10^{40}\right)^6 - 15\left(12\left(1.312806\times10^{40}\right)^2\right)^3\left(3\times1.312806\times10^{40}\right)\right)\times\frac{1}{186\,624}$$

Result:

−28 231 936 469 112 555 929 478 782 932 490 727 870 056 218 125 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Input interpretation:

$$\left(28\left(-4.10251875\times10^{38}\right)\left(3\times1.312806\times10^{40}\right)^6 - 15\left(12\left(1.312806\times10^{40}\right)^2\right)^3\left(3\times1.312806\times10^{40}\right)\right)\times\frac{1}{186\,624} = -\left(2.82319364691125\times10^{280}\right)$$

Result:

True

$-2.82319364691125*10^{280}$

$$c_8 = \frac{5Q_2^4}{4644864} - \frac{sM_2^7}{279936}$$

(1/4644864 * (5*(12*1.312806e+40^2)^4))-1/279936 * (-4.10251875e+38)*(3*1.312806e+40)^7

Input interpretation:

$$\frac{1}{4644864}\left(5\left(12\left(1.312806\times 10^{40}\right)^2\right)^4\right)-\frac{1}{279936}\left(-4.10251875\times 10^{38}\right)\left(3\times 1.312806\times 10^{40}\right)^7$$

Result:

$1.99090581991563733024954010487798281555641785015776 78... \times 10^{319}$

Repeating decimal:

$1.99090581991563733024954010487798281555641785015776 78... \times 10^{319}$

(period 6)

$1.990905819...*10^{319}$

Now, we have that:

(3.72101*10^161) *1/ (-3.4309724007375890450 4375*10^121)*1 /(1.74230993294139375*10^81) *1/ (-5.2922491875*10^40)

Input interpretation:

$$\left(3.72101\times 10^{161}\right)\left(-\frac{1}{3.4309724007375890450 4375\times 10^{121}}\right)\times \frac{1}{1.74230993294139375\times 10^{81}}\left(-\frac{1}{5.2922491875\times 10^{40}}\right)$$

Result:

$1.17619117123253569943308189484138059987496673075303 95... \times 10^{-82}$

$1.176191171...*10^{-82}$

(1.990905819*10^319) / (-2.82319364691125*10^280) * (1.04984*10^239) / (-3.438670463997*10^201)1.17619117123253569943308189484138059987496673075 30395 × 10^-82

Input interpretation:

$$-\frac{1.990905819\times 10^{319}}{2.82319364691125\times 10^{280}}\left(-\frac{1.04984\times 10^{239}}{3.438670463997\times 10^{201}}\right)\times 1.1761911712325356994330818948413805998749667307530395\times 10^{-82}$$

Result:

$2.532331285858419663512055256465613338429046341785628 2... \times 10^{-6}$

$2.532331285...*10^{-6}$

1/((((1.990905819*10^319) / (-2.82319364691125*10^280) * (1.04984*10^239) / (-3.438670463997*10^201)1.17619117123253569943308189484138059987496673075 30395 × 10^-82)))

Input interpretation:

$$1\Big/\left(-\frac{1.990905819\times 10^{319}}{2.82319364691125\times 10^{280}}\left(-\frac{1.04984\times 10^{239}}{3.438670463997\times 10^{201}}\right)\times 1.1761911712325356994330818948413805998749667307530395\times 10^{-82}\right)$$

Result:

394893.04009487686339526593890162000412887604042514923275 51...

394893.040094876…

Note that, from the formula of coefficients of the '5th order' mock theta function ψ_1(q): (A053261 OEIS Sequence)

sqrt(golden ratio) * exp(Pi*sqrt(n/15)) / (2*5^(1/4)*sqrt(n))

we obtain, for n = 427:

Input:

$$\sqrt{\phi}\times\frac{\exp\left(\pi\sqrt{\frac{427}{15}}\right)}{2\sqrt[4]{5}\sqrt{427}}+64\left(2^5+2^4\right)+55+\left(\frac{1}{30}\left(13\,\mathcal{W}_{\text{Wad}}\right)+\pi\right)$$

ϕ is the golden ratio

$\mathcal{W}_{Wad}$ is the Wadsworth constant

Exact result:

$$\frac{13\,\mathcal{W}_{Wad}}{30}+\frac{e^{\sqrt{427/15}\,\pi}\sqrt{\frac{\phi}{427}}}{2\sqrt[4]{5}}+3127+\pi$$

Exact form:

$$\frac{e^{\sqrt{427/15}\,\pi}\sqrt{\frac{\phi}{427}}}{2\sqrt[4]{5}}+\frac{312\,713}{100}+\pi$$

Decimal approximation:

394893.0479637474441478828132726070965329840167922103608634...

394893.047963747…

Alternate forms:

$$\frac{13\,\mathcal{W}_{Wad}}{30}+3127+\frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{4270}}\,e^{\sqrt{427/15}\,\pi}+\pi$$

$$\frac{13\,\mathcal{W}_{Wad}}{30}+3127+\frac{\sqrt{\frac{1}{854}\left(1+\sqrt{5}\right)}\,e^{\sqrt{427/15}\,\pi}}{2\sqrt[4]{5}}+\pi$$

$$\frac{11\,102\,\mathcal{W}_{Wad}+80\,113\,740+3\times5^{3/4}\sqrt{854\left(1+\sqrt{5}\right)}\,e^{\sqrt{427/15}\,\pi}+25\,620\,\pi}{25\,620}$$

We have also:

(2Pi)/10^3+((((1/((((1.990905819*10^319) / (-2.82319364691125*10^280) * (1.04984*10^239) / (-3.438670463997*10^201)1.1761911712325 × 10^-82)))))))^1/27

Input interpretation:

$$\frac{2\pi}{10^3}+\sqrt[27]{\frac{1}{-\frac{1.990905819\times10^{319}}{2.82319364691125\times10^{280}}\left(-\frac{1.04984\times10^{239}}{3.438670463997\times10^{201}}\right)\times1.1761911712325\times10^{-82}}}$$

Result:

1.617956509737327899315037118954996065365180408731368968425...

1.6179565097.... result that is a very good approximation to the value of the golden ratio 1,618033988749...

And:

Input interpretation:

$$\frac{1}{\frac{2\pi}{10^3}+\sqrt[27]{\frac{1}{-\frac{1.990905819\times10^{319}}{2.82319364691125\times10^{280}}\left(-\frac{1.04984\times10^{239}}{3.438670463997\times10^{201}}\right)\times1.1761911712325\times10^{-82}}}}$$

Result:

0.618063584516463956192381021086135475503461967952711821252...

0.618063584516....

And:

(2Pi)/10^3+(((((sqrt(golden ratio) * exp(Pi*sqrt(427/15)) / (2*5^(1/4)*sqrt(427))+64*(2^5+2^4)+55+(((13 *Wadsworth constant)/30 + π))))))^1/27

Input:

$$\frac{2\pi}{10^3}+\sqrt[27]{\sqrt{\phi}\times\frac{\exp\left(\pi\sqrt{\frac{427}{15}}\right)}{2\sqrt[4]{5}\sqrt{427}}+64\left(2^5+2^4\right)+55+\left(\frac{1}{30}\left(13\,\mathcal{W}_{\text{Wad}}\right)+\pi\right)}$$

ϕ is the golden ratio

$\mathcal{W}_{\text{Wad}}$ is the Wadsworth constant

Exact result:

$$\sqrt[27]{\frac{13\,\mathcal{W}_{\text{Wad}}}{30}+\frac{e^{\sqrt{427/15}\,\pi}\sqrt{\frac{\phi}{427}}}{2\sqrt[4]{5}}+3127+\pi}+\frac{\pi}{500}$$

Exact form:

$$\sqrt[27]{\frac{e^{\sqrt{427/15}\,\pi}\sqrt{\frac{\phi}{427}}}{2\sqrt[4]{5}} + \frac{312713}{100} + \pi + \frac{\pi}{500}}$$

Decimal approximation:

1.617956510926776037873729494000276701147205658273489385975...

1.61795651092… result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternate forms:

$$\sqrt[27]{\frac{13\,\mathcal{W}_{\text{Wad}}}{30} + 3127 + \frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{4270}}\,e^{\sqrt{427/15}\,\pi} + \pi} + \frac{\pi}{500}$$

$$\sqrt[27]{\frac{13\,\mathcal{W}_{\text{Wad}}}{30} + 3127 + \frac{\sqrt{\frac{1}{854}(1+\sqrt{5})}\,e^{\sqrt{427/15}\,\pi}}{2\sqrt[4]{5}} + \pi} + \frac{\pi}{500}$$

$$\frac{1}{640500}\left(50 \times 2^{25/27} \times 6405^{26/27} \sqrt[27]{11102\,\mathcal{W}_{\text{Wad}} + 80113740 + 3 \times 5^{3/4}\sqrt{854\left(1+\sqrt{5}\right)}\,e^{\sqrt{427/15}\,\pi} + 25620\,\pi} + 1281\,\pi\right)$$

1/[(2Pi)/10^3+(((((sqrt(golden ratio) * exp(Pi*sqrt(427/15)) / (2*5^(1/4)*sqrt(427))+64*(2^5+2^4)+55+(((13 *Wadsworth constant)/30 + π)))))))^1/27]

Input:

$$\frac{1}{\frac{2\pi}{10^3} + \sqrt[27]{\sqrt{\phi} \times \frac{\exp\left(\pi\sqrt{\frac{427}{15}}\right)}{2\sqrt[4]{5}\sqrt{427}} + 64\left(2^5+2^4\right) + 55 + \left(\frac{1}{30}\left(13\,\mathcal{W}_{\text{Wad}}\right) + \pi\right)}}$$

ϕ is the golden ratio

$\mathcal{W}_{\text{Wad}}$ is the Wadsworth constant

Exact result:

$$\frac{1}{\sqrt[27]{\frac{13\,\mathcal{W}_{\text{Wad}}}{30}+\frac{e^{\sqrt{427/15}\,\pi}\sqrt{\frac{\phi}{427}}}{2\sqrt[4]{5}}+3127+\pi+\frac{\pi}{500}}}$$

Exact form:

$$\frac{1}{\sqrt[27]{\frac{e^{\sqrt{427/15}\,\pi}\sqrt{\frac{\phi}{427}}}{2\sqrt[4]{5}}+\frac{312\,713}{100}+\pi+\frac{\pi}{500}}}$$

Decimal approximation:

0.6180635840620916815674470303677610250278341179698988 72030…

0.618063584…

Alternate forms:

$$\frac{1}{\sqrt[27]{\frac{13\,\mathcal{W}_{\text{Wad}}}{30}+3127+\frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{4270}}\,e^{\sqrt{427/15}\,\pi}+\pi+\frac{\pi}{500}}}$$

$$\frac{1}{\sqrt[27]{\frac{13\,\mathcal{W}_{\text{Wad}}}{30}+3127+\frac{\sqrt{\frac{1}{854}\left(1+\sqrt{5}\right)}\,e^{\sqrt{427/15}\,\pi}}{2\sqrt[4]{5}}+\pi+\frac{\pi}{500}}}$$

$$640\,500\Big/\left(50\times 2^{25/27}\times 6405^{26/27}\sqrt[27]{11\,102\,\mathcal{W}_{\text{Wad}}+80\,113\,740+3\times 5^{3/4}\sqrt{854\left(1+\sqrt{5}\right)}\,e^{\sqrt{427/15}\,\pi}+25\,620\,\pi+1281\,\pi}\right)$$

Now, we have that:

Now, the next order reads

$$\mathcal{S}_2^{\rm MGD} = \frac{A_2}{4}$$
$$= \frac{\varepsilon^2}{4}\int_{y_0}^{0} dy\mathcal{L}_2 = \frac{\pi M^2}{32}\left[\mathrm{U}_1(\xi, y_0) + \mathrm{U}_2(\xi)\log\left(\frac{2}{1+y_0}\right) + \mathrm{U}_3(\xi)\log(y_0)\right] ,$$

with ancillary functions $\mathrm{U}_1(\zeta, y_0) = \left[2\zeta(13-3y_0)-(\zeta^2+4)(7-y_0)\right](1-y_0)$, $\mathrm{U}_2(\zeta) = 16(\zeta-2)^2$ and $\mathrm{U}_3(\xi) = 2\left[(\xi-2)^2 - 2\xi\right]$. One can notice the contribution of the MGD parameter, encoding the finite brane tension, as one compares with the HEE for the Schwarzschild spacetime, corresponding to $\ell \to 0$ and, hence, $\xi \to 0$. Henceforth, in the general relativistic case of a rigid brane, $\sigma \to \infty$, one recovers the $2^{\rm nd}$-order correction for Schwarzschild spacetimes. On the other hand, the $2^{\rm nd}$-order corrections ratio are given by

$$\Phi_2^{\rm MGD} = \frac{\mathcal{S}_2^{\rm MGD}}{\mathcal{S}_2^{\rm Schw}} = 1 + \frac{\zeta}{4}(\xi - 6) + 4\xi\left[\frac{1 - y_0 - 2\log\left(\frac{2}{1+y_0}\right)}{7 - 8y_0 + y_0^2 - 2\log y_0 - 16\log\left(\frac{2}{1+y_0}\right)}\right] . \qquad (37)$$

Both corrections, the $1^{\rm st}$- and the $2^{\rm nd}$-order ones, have the MGD parameter as a dominant variable, when considering the minimal surface in large range, correspondly, the lower limit very close to zero. The $1^{\rm st}$-order ratio does not depend on such range. However, the $2^{\rm nd}$-order ratio has the limit

$$\Phi_2^{\rm MGD}|_{y_0 \to 0} = 1 + \frac{\xi}{4}(\zeta - 6) . \qquad (38)$$

As $\xi < 0$, it is observed an increment of the value of this order of correction to the HEE. Irrespectively of the limit taken, the limit $\xi \to 0$ recovers the $2^{\rm nd}$-order correction for the HEE in a Schwarzschild spacetime.

From (37), for $y_0 = 1$, we obtain (38). From the following Ramanujan mock theta function:

(https://en.wikipedia.org/wiki/Mock_modular_form#Order_6)

$$\sigma(q) = \sum_{n \geq 0} \frac{q^{(n+1)(n+2)/2}(-q;q)_n}{(q;q^2)_{n+1}}$$

That is: (A053271 sequence OEIS)

Sum_{n >= 0} q^((n+1)(n+2)/2) (1+q)(1+q^2)...(1+q^n)/((1-q)(1-q^3)...(1-q^(2n+1)))

From which:

sum q^((n+1)(n+2)/2) (1+q)(1+q^2)(1+q^n)))/((1-q)(1-q^3)(1-q^(2n+1))), n = 0 to k

$$\sum_{n=0}^{k} \frac{q^{1/2(n+1)(n+2)}(1+q)(1+q^2)(1+q^n)}{(1-q)(1-q^3)(1-q^{2n+1})}$$

$$\sum_{n=0}^{k} \frac{q^{1/2(n+1)(n+2)}(1+q)(1+q^2)(1+q^n)}{(1-q)(1-q^3)(1-q^{2n+1})}$$

For q = 0.5 and n = 2, we develop the above formula in the following way:

(((0.5^((2+1)(2+2)/2) (1+0.5)(1+0.5^2)(1+0.5^2)))/(((1-0.5)(1-0.5^3)(1-0.5^(2*2+1)))

$$\frac{0.5^{(2+1)\times(2+2)/2}(1+0.5)(1+0.5^2)(1+0.5^2)}{(1-0.5)(1-0.5^3)(1-0.5^{2\times2+1})}$$

0.086405529953917050691244239631336405529953917050691244239...

0.0864055...

For ξ = 0.0864055, that is the result of above Ramanujan mock theta function, we obtain:

1+(0.0864055/4)*(0.0864055-6)

Input interpretation:

$$1+\frac{0.0864055}{4}(0.0864055-6)$$

Result:

0.8722582276075625

0.8722582276075625

From which:

(((1+(0.0864055/4)*(0.0864055-6))))^1/256

Input interpretation:

$$\sqrt[256]{1+\frac{0.0864055}{4}(0.0864055-6)}$$

Result:

0.999466276...

0.999466276... 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 $\mathbf{0.989117352243 = \phi}$

1/2log base 0.999466276(((1+(0.0864055/4)*(0.0864055-6))))-Pi+1/golden ratio

Input interpretation:

$$\frac{1}{2}\log_{0.999466276}\left(1+\frac{0.0864055}{4}(0.0864055-6)\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476...

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

Alternative representation:

$$\frac{1}{2}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-\pi+\frac{1}{\phi}=-\pi+\frac{1}{\phi}+\frac{\log\left(1-\frac{0.510967}{4}\right)}{2\log(0.999466)}$$

Series representations:

$$\frac{1}{2}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\,(-0.127742)^k}{k}}{2\log(0.999466)}$$

$$\frac{1}{2}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-936.564\log(0.872258)-\frac{1}{2}\log(0.872258)\sum_{k=0}^{\infty}(-0.000533724)^k\,G(k)$$
$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

1/2log base 0.999466276(((1+(0.0864055/4)*(0.0864055-6))))+11+1/golden ratio

Input interpretation:

$$\frac{1}{2}\log_{0.999466276}\left(1+\frac{0.0864055}{4}\,(0.0864055-6)\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618...

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

Alternative representation:

$$\frac{1}{2}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}+\frac{\log\left(1-\frac{0.510967}{4}\right)}{2\log(0.999466)}$$

Series representations:

$$\frac{1}{2}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-0.127742)^k}{k}}{2\log(0.999466)}$$

$$\frac{1}{2}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-936.564\log(0.872258)-\frac{1}{2}\log(0.872258)\sum_{k=0}^{\infty}(-0.000533724)^k\,G(k)$$

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

27*1/4log base 0.999466276(((1+(0.0864055/4)*(0.0864055-6))))+1

Input interpretation:

$$27\times\frac{1}{4}\log_{0.999466276}\left(1+\frac{0.0864055}{4}\,(0.0864055-6)\right)+1$$

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

Result:

1729.00...

1729

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

Alternative representation:

$$\frac{27}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)+1=1+\frac{27\log\left(1-\frac{0.510967}{4}\right)}{4\log(0.999466)}$$

Series representations:

$$\frac{27}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)+1=1-\frac{27\sum_{k=1}^{\infty}\frac{(-1)^k(-0.127742)^k}{k}}{4\log(0.999466)}$$

$$\frac{27}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)+1=$$
$$1-12\,643.6\log(0.872258)-6.75\log(0.872258)\sum_{k=0}^{\infty}(-0.000533724)^k\,G(k)$$
$$\text{for }\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

12*1/4log base 0.999466276(((1+(0.0864055/4)*(0.0864055-6))))-29-11

Input interpretation:

$$12\times\frac{1}{4}\log_{0.999466276}\left(1+\frac{0.0864055}{4}\,(0.0864055-6)\right)-29-11$$

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

Result:

728.000...

728 (Ramanujan taxicab number)

Alternative representation:

$$\frac{12}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-29-11=$$
$$-40+\frac{12\log\left(1-\frac{0.510967}{4}\right)}{4\log(0.999466)}$$

Series representations:

$$\frac{12}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-29-11=$$
$$-40-\frac{3\sum_{k=1}^{\infty}\frac{(-1)^k(-0.127742)^k}{k}}{\log(0.999466)}$$

$$\frac{12}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-29-11 =$$
$$-40-5619.38\log(0.872258)-3\log(0.872258)\sum_{k=0}^{\infty}(-0.000533724)^k\,G(k)$$
$$\text{for}\left(G(0)=0 \text{ and } G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

12*1/4log base 0.999466276(((1+(0.0864055/4)*(0.0864055-6))))-29-11+47

Input interpretation:

$$12\times\frac{1}{4}\log_{0.999466276}\left(1+\frac{0.0864055}{4}\,(0.0864055-6)\right)-29-11+47$$

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

Result:

775.000...

775 result practically equal to the rest mass of Charged rho meson 775.11

Alternative representation:

$$\frac{12}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-29-11+47 = 7+\frac{12\log\left(1-\frac{0.510967}{4}\right)}{4\log(0.999466)}$$

Series representations:

$$\frac{12}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-29-11+47 = 7-\frac{3\sum_{k=1}^{\infty}\frac{(-1)^k\,(-0.127742)^k}{k}}{\log(0.999466)}$$

$$\frac{12}{4}\log_{0.999466}\left(1+\frac{1}{4}\times 0.0864055\,(0.0864055-6)\right)-29-11+47 =$$
$$7-5619.38\log(0.872258)-3\log(0.872258)\sum_{k=0}^{\infty}(-0.000533724)^k\,G(k)$$
$$\text{for}\left(G(0)=0 \text{ and } G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

Now, we have that:

$$\Phi_2^{\mathrm{EMGD}_1} = 8\left[\frac{y_0^2 - 4y_0 + 3 - 2\log(y_0) - 8\log\left(\frac{2}{1+y_0}\right)}{y_0^2 - 8y_0 + 7 - 2\log(y_0) - 16\log\left(\frac{2}{1+y_0}\right)}\right] \quad (52)$$

For $y_0 = 0.99$, we obtain:

8*[((((0.99^2-4*0.99+3-2 ln(0.99)-8 ln(2/1.99))))/((((0.99^2-8*0.99+7-2 ln(0.99)-16 ln(2/1.99))))]

Input:

$$8 \times \frac{0.99^2 - 4 \times 0.99 + 3 - 2\log(0.99) - 8\log\left(\frac{2}{1.99}\right)}{0.99^2 - 8 \times 0.99 + 7 - 2\log(0.99) - 16\log\left(\frac{2}{1.99}\right)}$$

$\log(x)$ is the natural logarithm

Result:

317234.6106478058859430701207273346791451318951095538859066...

317234.6106478…

Alternative representations:

$$\frac{8\left(0.99^2 - 4 \times 0.99 + 3 - 2\log(0.99) - 8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2 - 8 \times 0.99 + 7 - 2\log(0.99) - 16\log\left(\frac{2}{1.99}\right)} = \left(\frac{8\left(-0.96 - 2\log(a)\log_a(0.99) - 8\log(a)\log_a\left(\frac{2}{1.99}\right) + 0.99^2\right)}{-0.92 - 2\log(a)\log_a(0.99) - 16\log(a)\log_a\left(\frac{2}{1.99}\right) + 0.99^2} = \frac{8\,(0.0201 - 2\log(a)\log_a(0.99) - 8\log(a)\log_a(1.00503))}{0.0601 - 2\log(a)\log_a(0.99) - 16\log(a)\log_a(1.00503)}\right)$$

$$\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)} = \left(\frac{8\left(-0.96-2\log_e(0.99)-8\log_e\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log_e(0.99)-16\log_e\left(\frac{2}{1.99}\right)+0.99^2} = \frac{8\,(0.0201-2\log_e(0.99)-8\log_e(1.00503))}{0.0601-2\log_e(0.99)-16\log_e(1.00503)}\right)$$

$$\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)} = \left(\frac{8\left(-0.96+2\,\mathrm{Li}_1(0.01)+8\,\mathrm{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2\right)}{-0.92+2\,\mathrm{Li}_1(0.01)+16\,\mathrm{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2} = \frac{8\,(0.0201+8\,\mathrm{Li}_1(-0.00502513)+2\,\mathrm{Li}_1(0.01))}{0.0601+16\,\mathrm{Li}_1(-0.00502513)+2\,\mathrm{Li}_1(0.01)}\right)$$

Series representations:

$$\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)} = \frac{-0.0804+\sum_{k=1}^{\infty}\frac{-8(-1)^k(-0.01)^k-32(-0.00502513)^k}{k}}{-0.03005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.01)^k-8(-0.00502513)^k}{k}}$$

$$\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)} = \left(8\left(-0.005025+i\pi\left\lfloor\frac{\arg(0.99-x)}{2\pi}\right\rfloor+4\,i\pi\left\lfloor\frac{\arg(1.00503-x)}{2\pi}\right\rfloor+2.5\log(x)+0.125\sum_{k=1}^{\infty}\frac{(-1)^k\left(-4\,(0.99-x)^k-16\,(1.00503-x)^k\right)x^{-k}}{k}\right)\right) \Big/ \left(-0.015025+i\pi\left\lfloor\frac{\arg(0.99-x)}{2\pi}\right\rfloor+8\,i\pi\left\lfloor\frac{\arg(1.00503-x)}{2\pi}\right\rfloor+4.5\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(-0.5\,(0.99-x)^k-4\,(1.00503-x)^k\right)x^{-k}}{k}\right) \quad \text{for } x<0$$

$$\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)} =$$

$$\frac{-0.0804+\sum_{j=1}^{\infty}\left(8\left(\operatorname{Res}_{s=-j}\frac{(-0.01)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\right)+32\left(\operatorname{Res}_{s=-j}\frac{e^{5.2933\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\right)\right)}{-0.03005+\sum_{j=1}^{\infty}\left(\operatorname{Res}_{s=-j}\frac{(-0.01)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}+8\left(\operatorname{Res}_{s=-j}\frac{e^{5.2933\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\right)\right)}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

$\Gamma(x)$ is the gamma function

$\operatorname{Res}_{z=z_0} f$ is a complex residue

and:

1+1/sqrt((8*[(((0.99^2-4*0.99+3-2 ln(0.99)-8 ln(2/1.99))))/(((0.99^2-8*0.99+7-2 ln(0.99)-16 ln(2/1.99))))]))

Input:

$$1+\frac{1}{\sqrt{8\times\frac{0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}}$$

$\log(x)$ is the natural logarithm

Result:

1.001775455200579765569659068701249369523822062429397193634...

1.0017754552… result very near to the following Rogers-Ramanujan continued fraction:

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

Alternative representations:

$$1+\frac{1}{\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}} =$$

$$\left(1+\frac{1}{\sqrt{\frac{8\left(-0.96-2\log_e(0.99)-8\log_e\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log_e(0.99)-16\log_e\left(\frac{2}{1.99}\right)+0.99^2}}} = 1+\frac{1}{\sqrt{\frac{8(0.0201-2\log_e(0.99)-8\log_e(1.00503))}{0.0601-2\log_e(0.99)-16\log_e(1.00503)}}}\right)$$

$$1+\frac{1}{\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}} =$$

$$\left(1+\frac{1}{\sqrt{\frac{8\left(-0.96-2\log(a)\log_a(0.99)-8\log(a)\log_a\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log(a)\log_a(0.99)-16\log(a)\log_a\left(\frac{2}{1.99}\right)+0.99^2}}} = 1+\frac{1}{\sqrt{\frac{8(0.0201-2\log(a)\log_a(0.99)-8\log(a)\log_a(1.00503))}{0.0601-2\log(a)\log_a(0.99)-16\log(a)\log_a(1.00503)}}}\right)$$

$$1+\frac{1}{\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}}=$$

$$\left(1+\frac{1}{\sqrt{\frac{8\left(-0.96+2\,\text{Li}_1(0.01)+8\,\text{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2\right)}{-0.92+2\,\text{Li}_1(0.01)+16\,\text{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2}}}=\right.$$

$$\left.1+\frac{1}{\sqrt{\frac{8\,(0.0201+8\,\text{Li}_1(-0.00502513)+2\,\text{Li}_1(0.01))}{0.0601+16\,\text{Li}_1(-0.00502513)+2\,\text{Li}_1(0.01)}}}\right)$$

Series representations:

$$1+\frac{1}{\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}}=$$

$$1+1\Bigg/\left(\sqrt{\frac{7\,(-0.00719286+\log(0.99)+3.42857\log(1.00503))}{-0.03005+\log(0.99)+8\log(1.00503)}}\right.$$
$$\left.\sum_{k=0}^{\infty}e^{-1.94591\,k}\binom{\frac{1}{2}}{k}\left(\frac{-0.00719286+\log(0.99)+3.42857\log(1.00503)}{-0.03005+\log(0.99)+8\log(1.00503)}\right)^{-k}\right)$$

$$1+\frac{1}{\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}}=$$

$$1+1\Bigg/\left(\sqrt{\frac{7\,(-0.00719286+\log(0.99)+3.42857\log(1.00503))}{-0.03005+\log(0.99)+8\log(1.00503)}}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-0.142857)^k\left(\frac{-0.00719286+\log(0.99)+3.42857\log(1.00503)}{-0.03005+\log(0.99)+8\log(1.00503)}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$1+\frac{1}{\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}}=$$

$$\frac{1+\sqrt{\frac{-0.0804+\sum_{k=1}^{\infty}\frac{-8(-1)^k(-0.01)^k-32(-0.00502513)^k}{k}}{-0.03005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.01)^k-8(-0.00502513)^k}{k}}}}{\sqrt{\frac{-0.0804+\sum_{k=1}^{\infty}\frac{-8(-1)^k(-0.01)^k-32(-0.00502513)^k}{k}}{-0.03005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.01)^k-8(-0.00502513)^k}{k}}}}$$

Pi*sqrt(((8*[((((0.99^2-4*0.99+3-2 ln(0.99)-8 ln(2/1.99))))/((((0.99^2-8*0.99+7-2 ln(0.99)-16 ln(2/1.99))))]))))-29-11-2/5

Input:

$$\pi\sqrt{8\times\frac{0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}$$

log(*x*) is the natural logarithm

Result:

1729.0575749159554459915069899481948810416312263698396175 27...

1729.05757491…

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

Alternative representations:

$$\pi\sqrt{\frac{8\left(0.99^2-4\times0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}=$$

$$\left(-40-\frac{2}{5}+\pi\sqrt{\frac{8\left(-0.96-2\log(a)\log_a(0.99)-8\log(a)\log_a\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log(a)\log_a(0.99)-16\log(a)\log_a\left(\frac{2}{1.99}\right)+0.99^2}}=\right.$$

$$\left.-\frac{202}{5}+\pi\sqrt{\frac{8\,(0.0201-2\log(a)\log_a(0.99)-8\log(a)\log_a(1.00503))}{0.0601-2\log(a)\log_a(0.99)-16\log(a)\log_a(1.00503)}}\right)$$

$$\pi\sqrt{\frac{8\left(0.99^2-4\times0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}=$$

$$\left(-40-\frac{2}{5}+\pi\sqrt{\frac{8\left(-0.96-2\log_e(0.99)-8\log_e\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log_e(0.99)-16\log_e\left(\frac{2}{1.99}\right)+0.99^2}}=\right.$$

$$\left.-\frac{202}{5}+\pi\sqrt{\frac{8\,(0.0201-2\log_e(0.99)-8\log_e(1.00503))}{0.0601-2\log_e(0.99)-16\log_e(1.00503)}}\right)$$

$$\pi\sqrt{\frac{8\left(0.99^2-4\times0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}=$$

$$\left(-40-\frac{2}{5}+\pi\sqrt{\frac{8\left(-0.96+2\,\mathrm{Li}_1(0.01)+8\,\mathrm{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2\right)}{-0.92+2\,\mathrm{Li}_1(0.01)+16\,\mathrm{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2}}=\right.$$

$$\left.-\frac{202}{5}+\pi\sqrt{\frac{8\,(0.0201+8\,\mathrm{Li}_1(-0.00502513)+2\,\mathrm{Li}_1(0.01))}{0.0601+16\,\mathrm{Li}_1(-0.00502513)+2\,\mathrm{Li}_1(0.01)}}\right)$$

Series representations:

$$\pi\sqrt{\frac{8\left(0.99^2-4\times0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}=$$

$$\frac{1}{5}\left(-202+5\pi\sqrt{\frac{-0.0804+\sum_{k=1}^{\infty}\frac{-8(-1)^k(-0.01)^k-32(-0.00502513)^k}{k}}{-0.03005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.01)^k-8(-0.00502513)^k}{k}}}\right)$$

$$\pi\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}=$$

$$-\frac{202}{5}+\pi\sqrt{\frac{7(-0.00719286+\log(0.99)+3.42857\log(1.00503))}{-0.03005+\log(0.99)+8\log(1.00503)}}$$

$$\sum_{k=0}^{\infty} e^{-1.94591k}\binom{\frac{1}{2}}{k}\left(\frac{-0.00719286+\log(0.99)+3.42857\log(1.00503)}{-0.03005+\log(0.99)+8\log(1.00503)}\right)^{-k}$$

$$\pi\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}-29-11-\frac{2}{5}=$$

$$-\frac{202}{5}+\pi\sqrt{\frac{7(-0.00719286+\log(0.99)+3.42857\log(1.00503))}{-0.03005+\log(0.99)+8\log(1.00503)}}$$

$$\sum_{k=0}^{\infty}\frac{(-0.142857)^k\left(\frac{-0.00719286+\log(0.99)+3.42857\log(1.00503)}{-0.03005+\log(0.99)+8\log(1.00503)}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

sqrt(((8*[((((0.99^2-4*0.99+3-2 ln(0.99)-8 ln(2/1.99))))/(((0.99^2-8*0.99+7-2 ln(0.99)-16 ln(2/1.99))))]))))+123+47-4-2/golden ratio

Input:

$$\sqrt{8\times\frac{0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}+123+47-4-\frac{2}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Result:

727.99977130104424384961961703757484968927135751841189897 32...

727.9997713… ≈ 728 (Ramanujan taxicab number)

Alternative representations:

$$\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}+123+47-4-\frac{2}{\phi}=$$

$$\left(166-\frac{2}{\phi}+\sqrt{\frac{8\left(-0.96-2\log(a)\log_a(0.99)-8\log(a)\log_a\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log(a)\log_a(0.99)-16\log(a)\log_a\left(\frac{2}{1.99}\right)+0.99^2}}=\right.$$

$$\left.166-\frac{2}{\phi}+\sqrt{\frac{8(0.0201-2\log(a)\log_a(0.99)-8\log(a)\log_a(1.00503))}{0.0601-2\log(a)\log_a(0.99)-16\log(a)\log_a(1.00503)}}\right)$$

$$\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}+123+47-4-\frac{2}{\phi}=$$

$$\left(166-\frac{2}{\phi}+\sqrt{\frac{8\left(-0.96-2\log_e(0.99)-8\log_e\left(\frac{2}{1.99}\right)+0.99^2\right)}{-0.92-2\log_e(0.99)-16\log_e\left(\frac{2}{1.99}\right)+0.99^2}}=\right.$$

$$\left.166-\frac{2}{\phi}+\sqrt{\frac{8(0.0201-2\log_e(0.99)-8\log_e(1.00503))}{0.0601-2\log_e(0.99)-16\log_e(1.00503)}}\right)$$

$$\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}+123+47-4-\frac{2}{\phi}=$$

$$\left(166-\frac{2}{\phi}+\sqrt{\frac{8\left(-0.96+2\,\mathrm{Li}_1(0.01)+8\,\mathrm{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2\right)}{-0.92+2\,\mathrm{Li}_1(0.01)+16\,\mathrm{Li}_1\left(1-\frac{2}{1.99}\right)+0.99^2}}=\right.$$

$$\left.166-\frac{2}{\phi}+\sqrt{\frac{8(0.0201+8\,\mathrm{Li}_1(-0.00502513)+2\,\mathrm{Li}_1(0.01))}{0.0601+16\,\mathrm{Li}_1(-0.00502513)+2\,\mathrm{Li}_1(0.01)}}\right)$$

Series representations:

$$\sqrt{\frac{8\left(0.99^2-4\times 0.99+3-2\log(0.99)-8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2-8\times 0.99+7-2\log(0.99)-16\log\left(\frac{2}{1.99}\right)}}+123+47-4-\frac{2}{\phi}=$$

$$166-\frac{2}{\phi}+\sqrt{\frac{7(-0.00719286+\log(0.99)+3.42857\log(1.00503))}{-0.03005+\log(0.99)+8\log(1.00503)}}$$

$$\sum_{k=0}^{\infty} e^{-1.94591k}\binom{\frac{1}{2}}{k}\left(\frac{-0.00719286+\log(0.99)+3.42857\log(1.00503)}{-0.03005+\log(0.99)+8\log(1.00503)}\right)^{-k}$$

$$\sqrt{\frac{8\left(0.99^2 - 4\times 0.99 + 3 - 2\log(0.99) - 8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2 - 8\times 0.99 + 7 - 2\log(0.99) - 16\log\left(\frac{2}{1.99}\right)}} + 123 + 47 - 4 - \frac{2}{\phi} =$$

$$\frac{-2 + 166\,\phi + \phi\sqrt{\frac{-0.0804+\sum_{k=1}^{\infty}\frac{-8(-1)^k(-0.01)^k - 32(-0.00502513)^k}{k}}{-0.03005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.01)^k - 8(-0.00502513)^k}{k}}}}{\phi}$$

$$\sqrt{\frac{8\left(0.99^2 - 4\times 0.99 + 3 - 2\log(0.99) - 8\log\left(\frac{2}{1.99}\right)\right)}{0.99^2 - 8\times 0.99 + 7 - 2\log(0.99) - 16\log\left(\frac{2}{1.99}\right)}} + 123 + 47 - 4 - \frac{2}{\phi} =$$

$$166 - \frac{2}{\phi} + \sqrt{\frac{7(-0.00719286 + \log(0.99) + 3.42857\log(1.00503))}{-0.03005 + \log(0.99) + 8\log(1.00503)}}$$
$$\sum_{k=0}^{\infty}\frac{(-0.142857)^k\left(\frac{-0.00719286+\log(0.99)+3.42857\log(1.00503)}{-0.03005+\log(0.99)+8\log(1.00503)}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

For $y_0 = 0.01$, we obtain:

8*[((((0.01^2-4*0.01+3-2 ln(0.01)-8 ln(2/1.01))))/(((0.01^2-8*0.01+7-2 ln(0.01)-16 ln(2/1.01))))]

Input:

$$8\times\frac{0.01^2 - 4\times 0.01 + 3 - 2\log(0.01) - 8\log\left(\frac{2}{1.01}\right)}{0.01^2 - 8\times 0.01 + 7 - 2\log(0.01) - 16\log\left(\frac{2}{1.01}\right)}$$

log(x) is the natural logarithm

Result:

10.3166...

10.3166…

Alternative representations:

$$\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}=\frac{8\left(2.96-2\log(a)\log_a(0.01)-8\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log(a)\log_a(0.01)-16\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2}$$

$$\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}=\frac{8\left(2.96-2\log_e(0.01)-8\log_e\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log_e(0.01)-16\log_e\left(\frac{2}{1.01}\right)+0.01^2}$$

$$\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}=\frac{8\left(2.96+2\operatorname{Li}_1(0.99)+8\operatorname{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2\right)}{6.92+2\operatorname{Li}_1(0.99)+16\operatorname{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2}$$

Series representations:

$$\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}=\frac{-11.8404+\sum_{k=1}^{\infty}\frac{-8(-1)^k(-0.99)^k-32(-0.980198)^k}{k}}{-3.46005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}}$$

$$\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}=\left(8\left(-0.740025+i\pi\left\lfloor\frac{\arg(0.01-x)}{2\pi}\right\rfloor+4i\pi\left\lfloor\frac{\arg(1.9802-x)}{2\pi}\right\rfloor+2.5\log(x)+0.125\sum_{k=1}^{\infty}\frac{(-1)^k\left(-4(0.01-x)^k-16(1.9802-x)^k\right)x^{-k}}{k}\right)\right)\Big/\left(-1.73003+i\pi\left\lfloor\frac{\arg(0.01-x)}{2\pi}\right\rfloor+8i\pi\left\lfloor\frac{\arg(1.9802-x)}{2\pi}\right\rfloor+4.5\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(-0.5(0.01-x)^k-4(1.9802-x)^k\right)x^{-k}}{k}\right)\quad\text{for } x<0$$

$$\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}=$$

$$\frac{-11.8404+\sum_{j=1}^{\infty}\left(8\left(\text{Res}_{s=-j}\frac{(-0.99)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\right)+32\left(\text{Res}_{s=-j}\frac{e^{0.0200007\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\right)\right)}{-3.46005+\sum_{j=1}^{\infty}\left(\text{Res}_{s=-j}\frac{(-0.99)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}+8\left(\text{Res}_{s=-j}\frac{e^{0.0200007\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\right)\right)}$$

(((8*[(((0.01^2-4*0.01+3-2 ln(0.01)-8 ln(2/1.01))))/(((0.01^2-8*0.01+7-2 ln(0.01)-16 ln(2/1.01))))]))^2+29+4

Input:

$$\left(8\times\frac{0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4$$

$\log(x)$ is the natural logarithm

Result:

139.432...

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

Alternative representations:

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4=$$
$$33+\left(\frac{8\left(2.96-2\log_e(0.01)-8\log_e\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log_e(0.01)-16\log_e\left(\frac{2}{1.01}\right)+0.01^2}\right)^2$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4=$$
$$33+\left(\frac{8\left(2.96-2\log(a)\log_a(0.01)-8\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log(a)\log_a(0.01)-16\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2}\right)^2$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4=$$
$$33+\left(\frac{8\left(2.96+2\,\mathrm{Li}_1(0.99)+8\,\mathrm{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2\right)}{6.92+2\,\mathrm{Li}_1(0.99)+16\,\mathrm{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2}\right)^2$$

Series representations:

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4=$$
$$\left(33\left(16.2203-6.9201\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}+\left(\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}\right)^2-5.7408\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-4(-0.980198)^k}{k}+1.93939\left(\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-4(-0.980198)^k}{k}\right)^2\right)\right)\Bigg/\left(-3.46005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}\right)^2$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4=$$
$$33+\left(64\left(2.9601-2\left(2i\pi\left\lfloor\frac{\arg(0.01-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(0.01-x)^k x^{-k}}{k}\right)-8\left(2i\pi\left\lfloor\frac{\arg(1.9802-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.9802-x)^k x^{-k}}{k}\right)\right)^2\right)\Bigg/\left(6.9201-2\left(2i\pi\left\lfloor\frac{\arg(0.01-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(0.01-x)^k x^{-k}}{k}\right)-16\left(2i\pi\left\lfloor\frac{\arg(1.9802-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.9802-x)^k x^{-k}}{k}\right)\right)^2 \quad \text{for } x<0$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+29+4=$$

$$33+\left(64\left(-0.740025+i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{0.01}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+\right.\right.$$

$$4\,i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{1.9802}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+2.5\log(z_0)+$$

$$\left.\left.\sum_{k=1}^{\infty}\frac{(-1)^k\left(-0.5\,(0.01-z_0)^k-2\,(1.9802-z_0)^k\right)z_0^{-k}}{k}\right)^2\right)\Big/$$

$$\left(-1.73003+i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{0.01}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+8\,i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{1.9802}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+\right.$$

$$\left.4.5\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(-0.5\,(0.01-z_0)^k-4\,(1.9802-z_0)^k\right)z_0^{-k}}{k}\right)^2$$

(((8*[(((0.01^2-4*0.01+3-2 ln(0.01)-8 ln(2/1.01))))/(((0.01^2-8*0.01+7-2 ln(0.01)-16 ln(2/1.01))))]))^2+18+1/golden ratio

Input:

$$\left(8\times\frac{0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Result:

125.050...

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

Alternative representations:

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}=18+\frac{1}{\phi}+\left(\frac{8\left(2.96-2\log_e(0.01)-8\log_e\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log_e(0.01)-16\log_e\left(\frac{2}{1.01}\right)+0.01^2}\right)^2$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}=18+\frac{1}{\phi}+\left(\frac{8\left(2.96-2\log(a)\log_a(0.01)-8\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log(a)\log_a(0.01)-16\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2}\right)^2$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}=18+\frac{1}{\phi}+\left(\frac{8\left(2.96+2\,\mathrm{Li}_1(0.99)+8\,\mathrm{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2\right)}{6.92+2\,\mathrm{Li}_1(0.99)+16\,\mathrm{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2}\right)^2$$

Series representations:

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}=$$
$$\left(18\left(0.665108+19.7606\,\phi-0.38445\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}-\right.\right.$$
$$6.9201\,\phi\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}+$$
$$0.0555556\left(\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}\right)^2+$$
$$\phi\left(\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}\right)^2-$$
$$10.5248\,\phi\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-4\,(-0.980198)^k}{k}+$$
$$\left.\left.3.55556\,\phi\left(\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-4\,(-0.980198)^k}{k}\right)^2\right)\right)\Big/$$
$$\left(\phi\left(-3.46005+\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}\right)^2\right)$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}=$$

$$18+\frac{1}{\phi}+\left(64\left(2.9601-2\left(2\,i\,\pi\left\lfloor\frac{\arg(0.01-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-x)^k\,x^{-k}}{k}\right)-8\left(2\,i\,\pi\left\lfloor\frac{\arg(1.9802-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-x)^k\,x^{-k}}{k}\right)\right)^2\right)\Big/$$

$$\left(6.9201-2\left(2\,i\,\pi\left\lfloor\frac{\arg(0.01-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-x)^k\,x^{-k}}{k}\right)-16\left(2\,i\,\pi\left\lfloor\frac{\arg(1.9802-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-x)^k\,x^{-k}}{k}\right)\right)^2 \quad \text{for } x<0$$

$$\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+18+\frac{1}{\phi}=$$

$$18+\frac{1}{\phi}+\left(64\left(2.9601-2\left(\log(z_0)+\left\lfloor\frac{\arg(0.01-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-z_0)^k\,z_0^{-k}}{k}\right)-8\left(\log(z_0)+\left\lfloor\frac{\arg(1.9802-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-z_0)^k\,z_0^{-k}}{k}\right)\right)^2\right)\Big/$$

$$\left(6.9201-2\left(\log(z_0)+\left\lfloor\frac{\arg(0.01-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-z_0)^k\,z_0^{-k}}{k}\right)-16\left(\log(z_0)+\left\lfloor\frac{\arg(1.9802-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-z_0)^k\,z_0^{-k}}{k}\right)\right)^2$$

27*1/2(((((((8*[(((0.01^2-4*0.01+3-2 ln(0.01)-8 ln(2/1.01))))/(((0.01^2-8*0.01+7-2 ln(0.01)-16 ln(2/1.01))))])))^2+21))))+8+1/golden ratio

Input:

$$27 \times \frac{1}{2}\left(\left(8 \times \frac{0.01^2 - 4 \times 0.01 + 3 - 2\log(0.01) - 8\log\left(\frac{2}{1.01}\right)}{0.01^2 - 8 \times 0.01 + 7 - 2\log(0.01) - 16\log\left(\frac{2}{1.01}\right)}\right)^2 + 21\right) + 8 + \frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Result:

1728.95...

1728.95…

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

Alternative representations:

$$\frac{27}{2}\left(\left(\frac{8\left(0.01^2 - 4 \times 0.01 + 3 - 2\log(0.01) - 8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2 - 8 \times 0.01 + 7 - 2\log(0.01) - 16\log\left(\frac{2}{1.01}\right)}\right)^2 + 21\right) + 8 + \frac{1}{\phi} = 8 + \frac{1}{\phi} + \frac{27}{2}\left(21 + \left(\frac{8\left(2.96 - 2\log_e(0.01) - 8\log_e\left(\frac{2}{1.01}\right) + 0.01^2\right)}{6.92 - 2\log_e(0.01) - 16\log_e\left(\frac{2}{1.01}\right) + 0.01^2}\right)^2\right)$$

$$\frac{27}{2}\left(\left(\frac{8\left(0.01^2 - 4 \times 0.01 + 3 - 2\log(0.01) - 8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2 - 8 \times 0.01 + 7 - 2\log(0.01) - 16\log\left(\frac{2}{1.01}\right)}\right)^2 + 21\right) + 8 + \frac{1}{\phi} = 8 + \frac{1}{\phi} + \frac{27}{2}\left(21 + \left(\frac{8\left(2.96 - 2\log(a)\log_a(0.01) - 8\log(a)\log_a\left(\frac{2}{1.01}\right) + 0.01^2\right)}{6.92 - 2\log(a)\log_a(0.01) - 16\log(a)\log_a\left(\frac{2}{1.01}\right) + 0.01^2}\right)^2\right)$$

$$\frac{27}{2}\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)+8+\frac{1}{\phi}=$$

$$8+\frac{1}{\phi}+\frac{27}{2}\left(21+\left(\frac{8\left(2.96+2\,\mathrm{Li}_1(0.99)+8\,\mathrm{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2\right)}{6.92+2\,\mathrm{Li}_1(0.99)+16\,\mathrm{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2}\right)^2\right)$$

Series representations:

$$\frac{27}{2}\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)+8+\frac{1}{\phi}=$$

$$\left(291.5\left(0.164281+73.8587\,\phi+17.5474\,\phi\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+4\times 0.980198^k\right)}{k}+\right.\right.$$
$$2.96398\,\phi\left(\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+4\times 0.980198^k\right)}{k}\right)^2+$$
$$0.0474792\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}+$$
$$13.8402\,\phi\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}+$$
$$0.00343053\left(\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}\right)^2+$$
$$\left.\left.\phi\left(\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}\right)^2\right)\right)\Big/$$
$$\left(\phi\left(6.9201+\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}\right)^2\right)$$

$$\frac{27}{2}\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)+8+\frac{1}{\phi}=$$

$$\left(291.5\left(0.0410701+18.4647\,\phi-0.0237396\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}-6.9201\,\phi\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}+0.00343053\left(\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}\right)^2+\phi\left(\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}\right)^2-8.77368\,\phi\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-4\,(-0.980198)^k}{k}+2.96398\,\phi\left(\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-4\,(-0.980198)^k}{k}\right)^2\right)\right)\Big/\left(\phi\left(-3.46005+\sum_{k=1}^{\infty}\frac{-(-1)^k\,(-0.99)^k-8\,(-0.980198)^k}{k}\right)^2\right)$$

$$\frac{27}{2}\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)+8+\frac{1}{\phi}=8+\frac{1}{\phi}+\frac{27}{2}$$

$$\left(21+\left(64\left(2.9601-2\left(2\,i\,\pi\left\lfloor\frac{\arg(0.01-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-x)^k\,x^{-k}}{k}\right)-8\left(2\,i\,\pi\left\lfloor\frac{\arg(1.9802-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-x)^k\,x^{-k}}{k}\right)\right)^2\right)\Big/\left(6.9201-2\left(2\,i\,\pi\left\lfloor\frac{\arg(0.01-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-x)^k\,x^{-k}}{k}\right)-16\left(2\,i\,\pi\left\lfloor\frac{\arg(1.9802-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-x)^k\,x^{-k}}{k}\right)\right)^2\right)\quad \text{for } x<0$$

6*(((((((8*[(((0.01^2-4*0.01+3-2 ln(0.01)-8 ln(2/1.01))))/(((0.01^2-8*0.01+7-2 ln(0.01)-16 ln(2/1.01))))]))))^2+21))))-34-2-1/2

Input:

$$6\left(\left(8\times\frac{0.01^2-4\times0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)}{0.01^2-8\times0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}$$

$\log(x)$ is the natural logarithm

Result:

728.092...

728.092... ≈ 728 (Ramanujan taxicab number)

Alternative representations:

$$6\left(\left(\frac{8\left(0.01^2-4\times0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}=$$
$$-\frac{73}{2}+6\left(21+\left(\frac{8\left(2.96-2\log_e(0.01)-8\log_e\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log_e(0.01)-16\log_e\left(\frac{2}{1.01}\right)+0.01^2}\right)^2\right)$$

$$6\left(\left(\frac{8\left(0.01^2-4\times0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}=$$
$$-\frac{73}{2}+6\left(21+\left(\frac{8\left(2.96-2\log(a)\log_a(0.01)-8\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2\right)}{6.92-2\log(a)\log_a(0.01)-16\log(a)\log_a\left(\frac{2}{1.01}\right)+0.01^2}\right)^2\right)$$

$$6\left(\left(\frac{8\left(0.01^2-4\times0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}=$$
$$-\frac{73}{2}+6\left(21+\left(\frac{8\left(2.96+2\,\text{Li}_1(0.99)+8\,\text{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2\right)}{6.92+2\,\text{Li}_1(0.99)+16\,\text{Li}_1\left(1-\frac{2}{1.01}\right)+0.01^2}\right)^2\right)$$

Series representations:

$$6\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}=$$

$$\left(89.5\left(85.482+25.4006\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+4\times 0.980198^k\right)}{k}+4.2905\left(\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+4\times 0.980198^k\right)}{k}\right)^2+13.8402\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}+\left(\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}\right)^2\right)\right)\Big/\left(6.9201+\sum_{k=1}^{\infty}\frac{2(-1)^k\left((-0.99)^k+8\times 0.980198^k\right)}{k}\right)^2$$

$$6\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}=$$

$$\left(89.5\left(21.3705-6.9201\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}+\left(\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}\right)^2-12.7003\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-4(-0.980198)^k}{k}+4.2905\left(\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-4(-0.980198)^k}{k}\right)^2\right)\right)\Big/\left(-3.46005+\sum_{k=1}^{\infty}\frac{-(-1)^k(-0.99)^k-8(-0.980198)^k}{k}\right)^2$$

$$6\left(\left(\frac{8\left(0.01^2-4\times 0.01+3-2\log(0.01)-8\log\left(\frac{2}{1.01}\right)\right)}{0.01^2-8\times 0.01+7-2\log(0.01)-16\log\left(\frac{2}{1.01}\right)}\right)^2+21\right)-34-2-\frac{1}{2}=-\frac{73}{2}+$$

$$6\left(21+\left(64\left(2.9601-2\left(2i\pi\left\lfloor\frac{\arg(0.01-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-x)^k\,x^{-k}}{k}\right)-8\left(2i\pi\left\lfloor\frac{\arg(1.9802-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-x)^k\,x^{-k}}{k}\right)\right)^2\right)\Big/\left(6.9201-2\left(2i\pi\left\lfloor\frac{\arg(0.01-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.01-x)^k\,x^{-k}}{k}\right)-16\left(2i\pi\left\lfloor\frac{\arg(1.9802-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.9802-x)^k\,x^{-k}}{k}\right)\right)^2\right)\quad \text{for } x<0$$

Appendix

From:

Three-dimensional AdS gravity and extremal CFTs at c = 8m

Spyros D. Avramis, Alex Kehagiasb and Constantina Mattheopoulou

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m	L_0	d	S	S_{BH}
3	1	196883	12.1904	12.5664
	2	21296876	16.8741	17.7715
	3	842609326	20.5520	21.7656
4	2/3	139503	11.8458	11.8477
	5/3	69193488	18.0524	18.7328
	8/3	6928824200	22.6589	23.6954
5	1/3	20619	9.9340	9.3664
	4/3	86645620	18.2773	18.7328
	7/3	24157197490	23.9078	24.7812
6	1	42987519	17.5764	17.7715
	2	40448921875	24.4233	25.1327
	3	8463511703277	29.7668	30.7812
7	2/3	7402775	15.8174	15.6730
	5/3	33934039437	24.2477	24.7812
	8/3	16953652012291	30.4615	31.3460
8	1/3	278511	12.5372	11.8477
	4/3	13996384631	23.3621	23.6954
	7/3	19400406113385	30.5963	31.3460

Table 1: Degeneracies, microscopic entropies and semiclassical entropies for the first few values of m and L_0.

Conclusion

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

Note that:

$$g_{22} = \sqrt{(1+\sqrt{2})}.$$

Hence

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

so that

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

Hence

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

Thence:

$$64 g_{22}^{-24} = 4096 e^{-\pi\sqrt{22}} + \cdots$$

And

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

That are connected with 64, 128, 256, 512, 1024 and $4096 = 64^2$

All the results of the most important connections are signed in blue throughout the drafting of the paper. We highlight as in the development of the various equations we use always the constants π, ϕ, 1/ϕ, the Fibonacci and Lucas numbers, linked to the golden ratio, that play a fundamental role in the development, and therefore, in the final results of the analyzed expressions.

References

Stability of the graviton Bose-Einstein condensate in the brane-world
R. Casadio - Dipartimento di Fisica e Astronomia, Università di Bologna, via Irnerio 46, 40126 Bologna, Italy - INFN, Sezione di Bologna, viale B. Pichat 6, 40127 Bologna, Italy
Roldao da Rocha - CMCC, Universidade Federal do ABC, 09210-580, Santo André, SP, Brazil - arXiv: 1610.01572v1 [hep-th] 5 Oct 2016

Holographic entanglement entropy under the minimal geometric deformation and extensions
R. da Rocha, A. A. Tomaz - arXiv:1905.01548v2 [hep-th] 29 Dec 2019