On the Ramanujan's mathematics (Rogers-Ramanujan continued fractions, taxicab numbers and Manuscript Book 1 formulae) applied to various sectors of String Theory and to the Black Hole Physics: Further new possible mathematical connections XII.

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Abstract

In this research thesis, we have analyzed and deepened further Ramanujan expressions (Rogers-Ramanujan continued fractions, taxicab numbers and Manuscript Book 1 formulae) applied to some sectors of String Theory and to the Black Hole Physics. We have therefore described other new possible mathematical connections.

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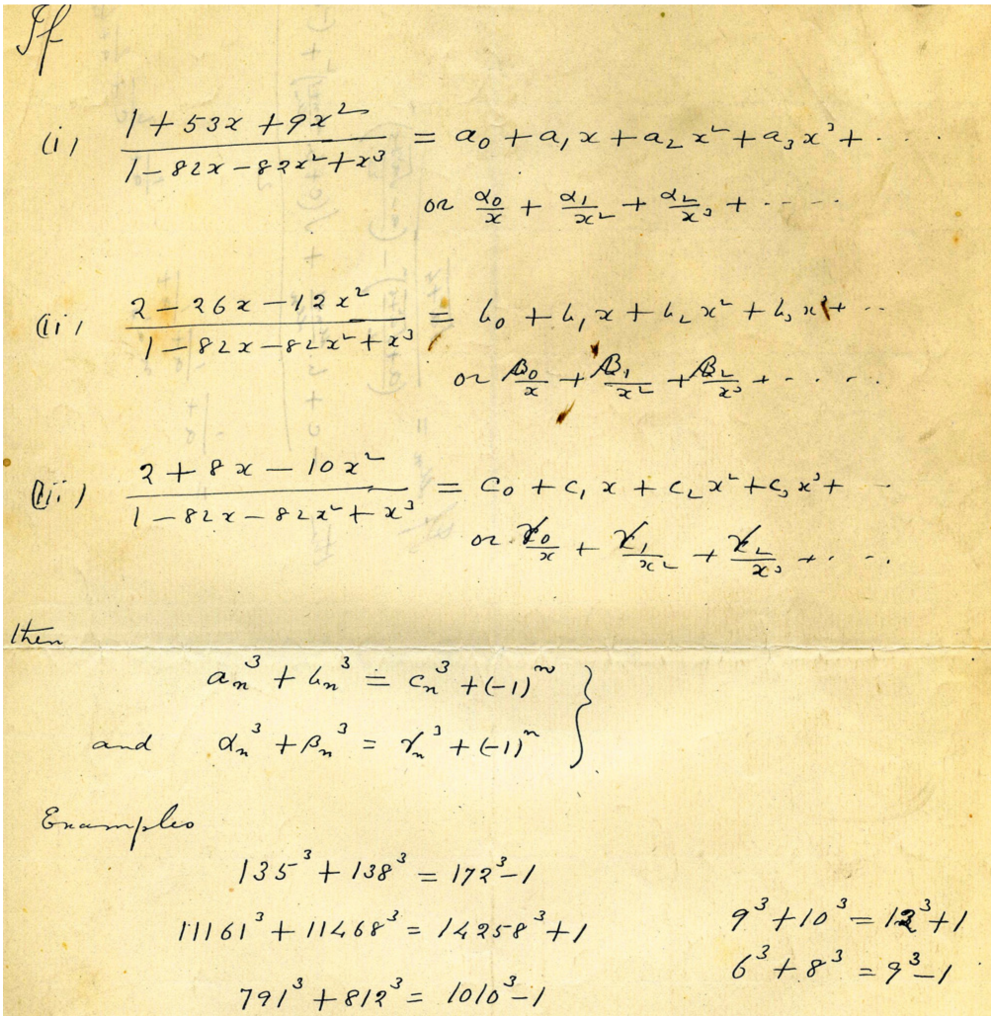
https://www.britannica.com/biography/Srinivasa-Ramanujan



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* $1729 = Ta(2) = 1^3 + 12^3 = 9^3 + 10^3$.

Dark Spinors Hawking Radiation in String Theory Black Holes

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arXiv:1507.03714v2 [gr-qc] 10 Jan 2016

From:

(1). In Boyer-Lindquist coordinates it reads:

$$ds^2 = -\frac{\Delta - a^2\sin^2\theta}{\Sigma}dt^2 + \frac{\Sigma}{\Delta}dr^2 + \Sigma d\theta^2 + \frac{\sin^2\theta}{\Sigma}\left[\left(r^2 - 2\beta r - a^2\right)^2 - \Delta a^2\sin^2\theta\right]d\varphi^2 + \\ -\frac{2a\sin^2\theta}{\Sigma}\left[\left(r^2 - 2\beta r - a^2\right)^2 - \Delta\right]dt d\varphi \quad (2)$$

where

$$\Sigma = r^2 - 2\beta r + a^2\cos^2\theta, \qquad \Delta = r^2 - 2\eta r + a^2 = (r - r_+)(r - r_-) \qquad \beta = \eta\sin h^2\frac{\alpha}{2} \quad (3)$$

and $r_+[r_-]$ are the coordinate outer [inner] singularities.

The metric (2) describes a black hole solution with charge Q, mass M, magnetic dipole moment μ, and angular momentum J, given by

$$Q = \frac{\eta}{\sqrt{2}}\sinh\alpha, \quad M = \frac{\eta}{2}(1 + \cosh\alpha), \quad \mu = \frac{1}{\sqrt{2}}\eta a\sinh\alpha, \quad J = \frac{\eta a}{2}(1 + \cosh\alpha). \quad (4)$$

The associated g-factor can be expressed as $g = \frac{2\mu M}{QJ} = 2$ [28]. The parameters can be expressed in terms of genuinely physical quantities as

$$\eta = M - \frac{Q^2}{2M}, \qquad \alpha = \operatorname{arcsinh}\left(\frac{2\sqrt{2}QM}{2M^2 - Q^2}\right), \qquad a = \frac{J}{M}$$

The coordinate singularities thus read $r_\pm = M - \frac{Q^2}{2M} \pm \sqrt{-\frac{J^2}{M^2} + \left(M - \frac{Q^2}{2M}\right)^2}$ which vanishes unless $|J| < M^2 - \frac{Q^2}{2}$. The area of the outer event horizon is given by

$$A = 8\pi M\left(M - \frac{Q^2}{2M} + \sqrt{-\frac{J^2}{M^2} + \left(M - \frac{Q^2}{2M}\right)^2}\right).$$

Thus in the extremal limit, since $|J| \to M - \frac{Q^2}{2M}$, it reads $A \to 8\pi|J|$. In this limit the horizon is hence finite and the surface gravity κ, or equivalently, the Hawking temperature $T_H = \kappa/2\pi$ is provided by [14]

$$\kappa = \frac{\sqrt{-4J^2 + (2M^2 - Q^2)^2}}{2M(2M^2 - Q^2 + \sqrt{-4J^2 + (2M^2 - Q^2)^2})}$$

$$A = 8\pi M\left(M - \frac{Q^2}{2M} + \sqrt{-\frac{J^2}{M^2} + \left(M - \frac{Q^2}{2M}\right)^2}\right).$$

M = 1.312806e+40, Q = √5

Q = √3 or Q > √3

8Pi*(1.312806e+40)*[(1.312806e+40-(5/(2*1.312806e+40))+sqrt((((-x^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))]

Input interpretation:

$$8\pi\times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{x^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)$$

Result:

$$3.29944\times 10^{41}\left(\sqrt{1.31281\times 10^{40}-5.80228\times 10^{-81}\,x^2}+1.31281\times 10^{40}\right)$$

Alternate form:

$$3.29944\times 10^{41}\sqrt{1.31281\times 10^{40}-5.80228\times 10^{-81}\,x^2}+4.33153\times 10^{81}$$

Roots:

(no roots exist)

Properties as a real function:

Domain

$\{x\in\mathbb{R}: -\frac{1}{2}5\times\sqrt{362\,010\,895\,245\,264\,418\,559\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999} \le x \le \frac{1}{2}5\times\sqrt{362\,010\,895\,245\,264\,418\,559\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999\,999}\}$

Range

$\{y\in\mathbb{R}: 4\,331\,526\,398\,500\,565\,482\,086\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000 \le y \le 32\,994\,413\,481\,508\,810\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(131\,280\,600\,000\,000\,000\,000\,000\,000+\sqrt{1\,312\,806}\right)\}$

Parity

even

ℝ is the set of real numbers

Series expansion at x = -1.50418×10^60:

$$\begin{cases} (4.33153\times10^{81} - 5.13045\times10^{53}\, i) + (1.85193\times10^{9}\, i)(x + 1.50418\times10^{60}) + (3.34245\times10^{-36}\, i)(x + 1.50418\times10^{60})^2 + (1.20652\times10^{-80}\, i)(x + 1.50418\times10^{60})^3 + (5.44397\times10^{-125}\, i)(x + 1.50418\times10^{60})^4 + (2.75115\times10^{-169}\, i)(x + 1.50418\times10^{60})^5 + O((x + 1.50418\times10^{60})^6) & 1.74554\times10^{-20}\, \text{Im}(x) < 5.80228\times10^{-81}\, \text{Im}((x + 1.50418\times10^{60})^2) \\ (4.33153\times10^{81} + 5.13045\times10^{53}\, i) - (1.85193\times10^{9}\, i)(x + 1.50418\times10^{60}) - (3.34245\times10^{-36}\, i)(x + 1.50418\times10^{60})^2 - (1.20652\times10^{-80}\, i)(x + 1.50418\times10^{60})^3 - (5.44397\times10^{-125}\, i)(x + 1.50418\times10^{60})^4 - (2.75115\times10^{-169}\, i)(x + 1.50418\times10^{60})^5 + O((x + 1.50418\times10^{60})^6) & \text{(otherwise)} \end{cases}$$

Series expansion at x = 0:

$$4.33153\times10^{81} - 8.35428\times10^{-60}\, x^2 - 9.23097\times10^{-181}\, x^4 + O(x^5)$$

(Taylor series)

Series expansion at x = 1.50418×10^60:

$$\left(3.29944\times10^{41}\sqrt{2.62561\times10^{40}-1.74554\times10^{-20}\,x}+4.33153\times10^{81}\right)+$$
$$5.48377\times10^{-20}\sqrt{2.62561\times10^{40}-1.74554\times10^{-20}\,x}\,\left(x-1.50418\times10^{60}\right)-$$
$$4.5571\times10^{-81}\sqrt{2.62561\times10^{40}-1.74554\times10^{-20}\,x}\,\left(x-1.50418\times10^{60}\right)^2+$$
$$7.57405\times10^{-142}\sqrt{2.62561\times10^{40}-1.74554\times10^{-20}\,x}\,\left(x-1.50418\times10^{60}\right)^3-$$
$$1.57354\times10^{-202}\sqrt{2.62561\times10^{40}-1.74554\times10^{-20}\,x}\,\left(x-1.50418\times10^{60}\right)^4+$$
$$O\left(\left(x-1.50418\times10^{60}\right)^5\right)$$

(generalized Puiseux series)

Series expansion at x = ∞:

$$\left(25.1327\sqrt{-x^2}+4.33153\times10^{81}\right)-\frac{2.84323\times10^{121}\sqrt{-x^2}}{x^2}+O\left(\left(\frac{1}{x}\right)^4\right)$$

(Puiseux series)

Derivative:

$$\frac{d}{dx}\Big(329\,944\,134\,815\,088\,149\,437\,614\,228\,845\,320\,585\,871\,360\Big(\sqrt{(13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400-5.80228\times10^{-81}\,x^2)}+13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400\Big)\Big)=$$
$$-\frac{1.91443\times10^{-39}\,x}{\sqrt{13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400-5.80228\times10^{-81}\,x^2}}$$

Indefinite integral:

$$\int 8\,\pi\,1.312806\times10^{40}\left(1.312806\times10^{40}-\frac{5}{2\,1.312806\times10^{40}}+\sqrt{-\frac{x^2}{(1.312806\times10^{40})^2}+\left(1.312806\times10^{40}-\left(\frac{5}{2\,1.312806\times10^{40}}\right)^2\right)}\right)dx=$$
$$x\left(1.64972\times10^{41}\sqrt{1.31281\times10^{40}-5.80228\times10^{-81}\,x^2}+4.33153\times10^{81}\right)+2.84323\times10^{121}\sin^{-1}\left(6.64812\times10^{-61}\,x\right)+\text{constant}$$

$\sin^{-1}(x)$ is the inverse sine function

Global maximum:

$$\max\{329\,944\,134\,815\,088\,149\,437\,614\,228\,845\,320\,585\,871\,360\,(\sqrt{(13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400 - 5.80228\times 10^{-81}\,x^2)} + 13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400)\} = 3\,627\,774\,127\,456\,815\,639\,530\,787\,597\,196\,574\,102\,919\,810\,209\,388\,953\,600\left(1\,193\,990\,101\,455\,710\,773\,617\,623\,040 + \sqrt{108\,592\,767\,124\,329}\right) \text{ at } x = 0$$

Global minimal:

$$\min\{329\,944\,134\,815\,088\,149\,437\,614\,228\,845\,320\,585\,871\,360\,(\sqrt{(13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400 - 5.80228\times 10^{-81}\,x^2)} + 13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400)\} = 4\,331\,526\,398\,500\,565\,932\,715\,087\,540\,028\,575\,347\,223\,021\,213\,577\,359\,699\,712\,851\,560\,462\,974\,864\,850\,944\,000 \text{ at } x = -\frac{15\,820\,279\,490\,848\,302\,930\,678\,856\,003\,092\,480}{\sqrt{9\,040\,102\,512\,832\,509\,502\,646\,974\,031\,232\,662\,040\,622\,266\,291\,576\,609}}$$

$$\min\{329\,944\,134\,815\,088\,149\,437\,614\,228\,845\,320\,585\,871\,360\,(\sqrt{(13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400 - 5.80228\times 10^{-81}\,x^2)} + 13\,128\,059\,999\,999\,999\,398\,713\,729\,449\,103\,615\,590\,400)\} = 4\,331\,526\,398\,500\,565\,932\,715\,087\,540\,028\,575\,347\,223\,021\,213\,577\,359\,699\,712\,851\,560\,462\,974\,864\,850\,944\,000 \text{ at } x = \frac{15\,820\,279\,490\,848\,302\,930\,678\,856\,003\,092\,480}{\sqrt{9\,040\,102\,512\,832\,509\,502\,646\,974\,031\,232\,662\,040\,622\,266\,291\,576\,609}}$$

Limit:

$$\lim_{x\to\pm\infty} 3.29944\times 10^{41}\left(1.31281\times 10^{40} + \sqrt{1.31281\times 10^{40} - 5.80228\times 10^{-81}\,x^2}\right) = 4.33153\times 10^{81}$$

thence, we have, for J = -1.50418e+60:

8Pi*(1.312806e+40)*[(1.312806e+40-(5/(2*1.312806e+40))+sqrt((((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))]

Input interpretation:

$$8\pi \times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)$$

Result:

$4.33153\ldots \times 10^{81}$

$4.33153\ldots * 10^{81} = A$

ln((((((8Pi*(1.312806e+40)*[(1.312806e+40-(5/(2*1.312806e+40))+sqrt((((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))])))))))

Input interpretation:

$$\log\left(8\pi \times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)\right)$$

$\log(x)$ is the natural logarithm

Result:

187.97531...

187.97531…

1+1/(3*187.97531252938)

Input interpretation:

$$1+\frac{1}{3\times 187.97531252938}$$

Result:

1.001773282506346328288704817065864358161065637225958727487...

1.0017732825…. result very near to the following Rogers-Ramanujan continued fraction:

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

3Pi*(187.97531252938)-55+13-1/golden ratio

Input interpretation:

$$3\pi\times 187.97531252938-55+13-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1729.0075487069...

1729.0075487069….

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:

$$3\pi\, 187.975312529380000-55+13-\frac{1}{\phi} =$$

$$-42+101506.668765865200^{\circ}--\frac{1}{2\cos(216^{\circ})}$$

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 + 563.925937588140000\,\pi - -\frac{1}{2\cos(216\,^\circ)}$$

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 + 101506.668765865200\,^\circ - \frac{1}{2\cos\left(\frac{\pi}{5}\right)}$$

Series representations:

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 - \frac{1}{\phi} + 2255.70375035256000\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -1169.851875176280 - \frac{1.000000000000000}{\phi} + 1127.851875176280\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 - \frac{1}{\phi} + 563.925937588140000\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 - \frac{1}{\phi} + 1127.85187517628000\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 - \frac{1}{\phi} + 2255.70375035256000\int_0^{1}\sqrt{1-t^2}\,dt$$

$$3\,\pi\,187.975312529380000 - 55 + 13 - \frac{1}{\phi} = -42 - \frac{1}{\phi} + 1127.85187517628000\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

-47+ln[8Pi*(1.312806e+40)*[(1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))]]

Input interpretation:

$$-47+\log\left(8\pi\times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)\right)$$

log(x) is the natural logarithm

Result:

140.97531...

140.97531…

From:

(140.975312529387315154 - golden ratio)

Input interpretation:

$140.975312529387315154-\phi$

ϕ is the golden ratio

Result:

139.357278540637420306...

139.3572785…. result practically equal to the rest mass of Pion meson 139.57 MeV

(140.975312529387315154 - 13-golden ratio^2)

Input interpretation:

$140.975312529387315154-13-\phi^2$

ϕ is the golden ratio

Result:

125.357278540637420306...

125.3572785…. 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:

$$140.9753125293873151540000 - 13 - \phi^2 = 127.9753125293873151540000 - (2 \sin(54 °))^2$$

$$140.9753125293873151540000 - 13 - \phi^2 = 127.9753125293873151540000 - (-2 \cos(216 °))^2$$

$$140.9753125293873151540000 - 13 - \phi^2 = 127.9753125293873151540000 - (-2 \sin(666 °))^2$$

We have also:

-21+[[8Pi*(1.312806e+40)*[1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2))]]]^1/37

Input interpretation:

$$-21 + \left(8\pi \times 1.312806 \times 10^{40} \left(1.312806 \times 10^{40} - \frac{5}{2 \times 1.312806 \times 10^{40}} + \sqrt{-\frac{(-1.50418 \times 10^{60})^2}{(1.312806 \times 10^{40})^2} + \left(1.312806 \times 10^{40} - \left(\frac{5}{2 \times 1.312806 \times 10^{40}}\right)^2\right)}\right)\right)^{\wedge}(1/37)$$

Result:

139.8406...

139.8406…. result practically equal to the rest mass of Pion meson 139.57 MeV

-34-golden ratio+[[8Pi*(1.312806e+40)*[1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2))]]]^1/37

Input interpretation:

$$-34-\phi+\left(8\pi\times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)\right)^{\wedge}(1/37)$$

ϕ is the golden ratio

Result:

125.2225723979358381924159675830050004216576576900037213713...

125.22257239…. 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

-34-x+[[8Pi*(1.312806e+40)*[1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2))]]]^1/37 = 125.2225723979358

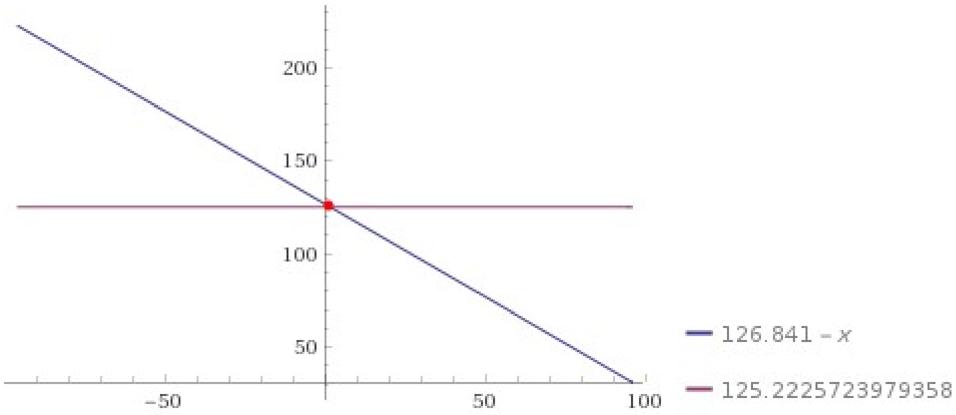
Input interpretation:

$$-34-x+\left(8\pi\times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)\right)^{\wedge}(1/37)=125.2225723979358$$

Result:

$126.841-x=125.2225723979358$

Plot:



Alternate forms:

$1.61803 - x = 0$

$126.841 - x = 125.2225723979358$

Solution:

$x \approx 1.61803$

1.61803 result equal to the value of the golden ratio

-21-golden ratio-Pi+[[8Pi*(1.312806e+40)*[1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))]]]^1/37

Input interpretation:

$$-21-\phi-\pi+\left(8\pi\times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)\right)^{\wedge}(1/37)$$

ϕ is the golden ratio

Result:

135.0810...

135.081....≈ 135 (Ramanujan taxicab number) and result practically equal to the rest mass of Pion meson 134.9766 MeV

-21-golden ratio-x+[[8Pi*(1.312806e+40)*[1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))]]]^1/37 = 135.080979744346

Input interpretation:

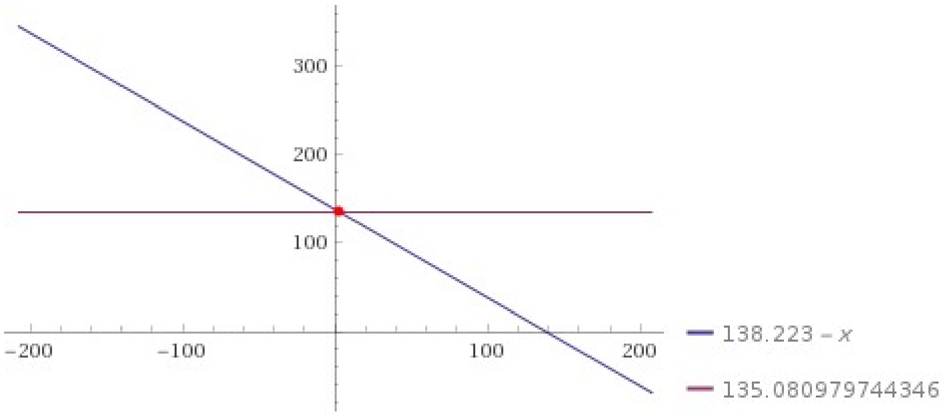
$$-21-\phi-x+\left(8\pi\times 1.312806\times 10^{40}\left(1.312806\times 10^{40}-\frac{5}{2\times 1.312806\times 10^{40}}+\sqrt{-\frac{(-1.50418\times 10^{60})^2}{(1.312806\times 10^{40})^2}+\left(1.312806\times 10^{40}-\left(\frac{5}{2\times 1.312806\times 10^{40}}\right)^2\right)}\right)\right)\text{\^{}}(1/37)=135.080979744346$$

ϕ is the golden ratio

Result:

$138.223-x=135.080979744346$

Plot:



Alternate forms:

$3.14159-x=0$

$138.223-x=135.080979744346$

Solution:

$x \approx 3.14159$

3.14159 = **π**

-21-x-Pi+[[8Pi*(1.312806e+40)*[1.312806e+40-(5/(2*1.312806e+40))+sqrt((-(-1.50418e+60)^2/(1.312806e+40)^2+(1.312806e+40-(5/(2*1.312806e+40))^2)))]]]^1/37 = 135.080979744346

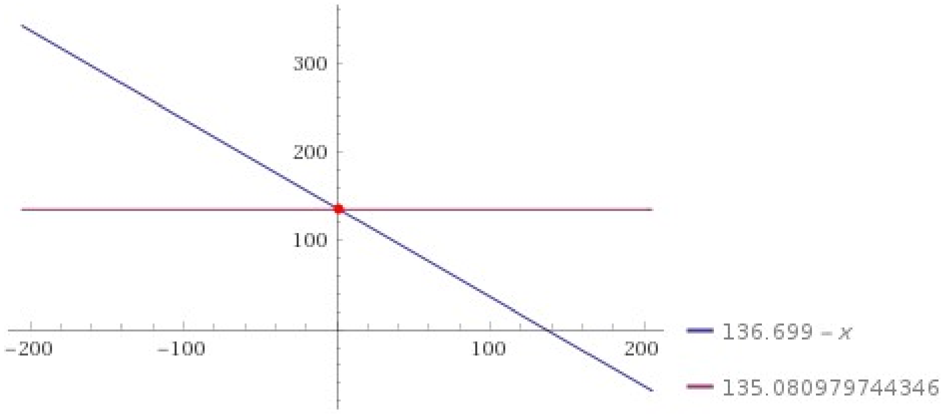
Input interpretation:

$$-21 - x - \pi + \left(8\,\pi \times 1.312806 \times 10^{40} \left(1.312806 \times 10^{40} - \frac{5}{2 \times 1.312806 \times 10^{40}} + \sqrt{-\frac{(-1.50418 \times 10^{60})^2}{(1.312806 \times 10^{40})^2} + \left(1.312806 \times 10^{40} - \left(\frac{5}{2 \times 1.312806 \times 10^{40}}\right)^2\right)}\right)\right) \text{^}(1/37) = 135.080979744346$$

Result:

$136.699 - x = 135.080979744346$

Plot:



Alternate forms:

$1.61803 - x = 0$

$136.699 - x = 135.080979744346$

Solution:

$x \approx 1.61803$

1.61803 = golden ratio

Now, we have that:

$$\kappa = \frac{\sqrt{-4J^2 + (2M^2 - Q^2)^2}}{2M\left(2M^2 - Q^2 + \sqrt{-4J^2 + (2M^2 - Q^2)^2}\right)}$$

M = 1.312806e+40, Q = √5 J = -1.50418e+60

sqrt(((-4*(-1.50418e+60)^2+(2*1.312806e+40^2-5)^2)))/(((2*1.312806e+40(2*1.312806e+40^2-5+sqrt(((-4*(-1.50418e+60)^2+(2*1.312806e+40^2-5)^2)))

Input interpretation:

$$\left(\sqrt{-4\left(-1.50418\times10^{60}\right)^2+\left(2\left(1.312806\times10^{40}\right)^2-5\right)^2}\right)/\left(2\times1.312806\times10^{40}\left(2\left(1.312806\times10^{40}\right)^2-5+\sqrt{-4\left(-1.50418\times10^{60}\right)^2+\left(2\left(1.312806\times10^{40}\right)^2-5\right)^2}\right)\right)$$

Result:

$1.90432\ldots \times 10^{-41}$

$1.90432\ldots * 10^{-41} = \kappa$

We have also:

((((((sqrt(((-4*(-1.50418e+60)^2+(2*1.312806e+40^2-5)^2)))/(((2*1.312806e+40(2*1.312806e+40^2-5+sqrt(((-4*(-1.50418e+60)^2+(2*1.312806e+40^2-5)^2))))))))))))^1/2048

Input interpretation:

$$\left(\left(\sqrt{-4\left(-1.50418\times 10^{60}\right)^2+\left(2\left(1.312806\times 10^{40}\right)^2-5\right)^2}\right)\Big/\left(2\times 1.312806\times 10^{40}\left(2\left(1.312806\times 10^{40}\right)^2-5+\sqrt{-4\left(-1.50418\times 10^{60}\right)^2+\left(2\left(1.312806\times 10^{40}\right)^2-5\right)^2}\right)\right)\right)\text{^}(1/2048)$$

Result:

0.955250031...

0.955250031…. result very near to the following Rogers-Ramanujan continued fraction:

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

A = 4.33153…*10^{81}

1+1/((((4.33153e+81) * (1.90432 × 10^-41)^2)))-18/10^3

Input interpretation:

$$1+\frac{1}{4.33153\times 10^{81}\left(1.90432\times 10^{-41}\right)^2}-\frac{18}{10^3}$$

Result:

1.618617856783841036057906862489493826207174523035915763218...

1.6186178567…. result that is a very good approximation to the value of the golden ratio 1,618033988749...

((((4.33153e+81) * (1.90432 × 10^-41))))

Input interpretation:

$4.33153\times10^{81}\times1.90432\times10^{-41}$

Result:

82 486 192 096 000 000 000 000 000 000 000 000 000 000

Scientific notation:

$8.2486192096\times10^{40}$

$8.2486192096*10^{40}$

((((4.33153e+81) * (1.90432 × 10^-41))))^1/19-Pi

Input interpretation:

$\sqrt[19]{4.33153\times10^{81}\times1.90432\times10^{-41}}-\pi$

Result:

139.2531...

139.2531…. result practically equal to the rest mass of Pion meson 139.57 MeV

((((4.33153e+81) * (1.90432 × 10^-41))))^1/19-13-Pi-1/golden ratio

Input interpretation:

$\sqrt[19]{4.33153\times10^{81}\times1.90432\times10^{-41}}-13-\pi-\frac{1}{\phi}$

ϕ is the golden ratio

Result:

125.6350...

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

Now, we have:

$$Q = \frac{\eta}{\sqrt{2}} \sinh\alpha, \quad M = \frac{\eta}{2}(1+\cosh\alpha), \quad \mu = \frac{1}{\sqrt{2}}\eta a \sinh\alpha\,, \quad J = \frac{\eta a}{2}(1+\cosh\alpha)\,. \qquad (4)$$

The associated g-factor can be expressed as $g = \frac{2\mu M}{QJ} = 2$ [28]. The parameters can be expressed in terms of genuinely physical quantities as

$$\eta = M - \frac{Q^2}{2M}, \qquad \alpha = \operatorname{arcsinh}\left(\frac{2\sqrt{2}QM}{2M^2 - Q^2}\right), \qquad a = \frac{J}{M}$$

The coordinate singularities thus read $r_\pm = M - \frac{Q^2}{2M} \pm \sqrt{-\frac{J^2}{M^2} + \left(M - \frac{Q^2}{2M}\right)^2}$ which vanishes unless

Finally the Hawking temperature of the Kerr-Sen dilaton-axion black hole is acquired:

$$T_H = \frac{1}{2\pi} \frac{(r_+ + m)}{r_+^2 - 2\beta r_+ + a^2} \qquad (34)$$

which is an universal formula also obtained by other methods for the Hawking temperature from fermions tunnelling [30]. Obviously when the parameter a tends to zero, Eq.(34) provides the well-known Hawking radiation associated to the static black hole.

For:

$$r_\pm = M - \frac{Q^2}{2M} \pm \sqrt{-\frac{J^2}{M^2} + \left(M - \frac{Q^2}{2M}\right)^2}$$

$$\beta = \eta \sin h^2 \frac{\alpha}{2}$$

$$T_H = \frac{1}{2\pi} \frac{(r_+ + m)}{r_+^2 - 2\beta r_+ + a^2}$$

M = 1.312806e+40, Q = √5;   J = -1.50418e+60

$$\eta = M - \frac{Q^2}{2M}, \qquad \alpha = \operatorname{arcsinh}\left(\frac{2\sqrt{2}QM}{2M^2 - Q^2}\right), \qquad a = \frac{J}{M}$$

We obtain:

(-1.50418e+60)/(1.312806e+40)

Input interpretation:

$$-\frac{1.50418\times 10^{60}}{1.312806\times 10^{40}}$$

Result:

$-1.1457747755570891662591426303657966218923435755168 69\ldots \times 10^{20}$

$-1.145774775557*10^{20} = a$

asinh (((2sqrt2*sqrt5*1.312806e+40)/(2*(1.312806e+40)^2-5)))

Input interpretation:

$$\sinh^{-1}\left(\frac{2\sqrt{2}\sqrt{5}\times 1.312806\times 10^{40}}{2(1.312806\times 10^{40})^2-5}\right)$$

$\sinh^{-1}(x)$ is the inverse hyperbolic sine function

Result:

$2.40879\ldots \times 10^{-40}$

$2.40879*10^{-40} = \alpha$

(1.312806e+40)-5/(2*1.312806e+40)

Input interpretation:

$$1.312806\times 10^{40} - \frac{5}{2\times 1.312806\times 10^{40}}$$

Result:

$1.3128059999999999999999999999999999999999999999999\ldots \times 10^{40}$

$1.3128059999\ldots*10^{40} = \eta$

We have:

$1.3128059999*10^{40} = \eta \quad 2.40879*10^{-40} = \alpha \quad -1.145774775557*10^{20} = a$

M = 1.312806e+40, Q = √5; J = -1.50418e+60

From

$$r_{\pm} = M - \frac{Q^2}{2M} \pm \sqrt{-\frac{J^2}{M^2} + \left(M - \frac{Q^2}{2M}\right)^2}$$

We obtain:

(1.312806e+40)-5/(2*1.312806e+40)+sqrt[(((((-(-1.50418e+60)^2/(1.312806e+40)^2+((((1.312806e+40)-5/(2*1.312806e+40)))^2)))))]

Input interpretation:

$$1.312806\times10^{40} - \frac{5}{2\times1.312806\times10^{40}} + \sqrt{-\frac{(-1.50418\times10^{60})^2}{(1.312806\times10^{40})^2} + \left(1.312806\times10^{40} - \frac{5}{2\times1.312806\times10^{40}}\right)^2}$$

Result:

$2.62561\ldots\times10^{40}$

$2.62561*10^{40} = r_{\pm}$

Now:

$$\beta = \eta \sin h^2 \frac{\alpha}{2}$$

1.3128059999e+40 sinh^2(1/2*2.40879e-40)

Input interpretation:

$$1.3128059999\times10^{40}\ \sinh^2\left(\frac{1}{2}\times2.40879\times10^{-40}\right)$$

sinh(x) is the hyperbolic sine function

Result:

$1.90431\ldots\times10^{-40}$

$1.90431*10^{-40} = \beta$

From

$$T_H = \frac{1}{2\pi}\frac{(r_+ + m)}{r_+^2 - 2\beta r_+ + a^2}$$

we obtain, in conclusion:

1/(2Pi)*(2.62561e+40+x)/(((((2.62561e+40)^2-(2*1.90431e-40*2.62561e+40)+(-1.145774775557e+20)^2)))

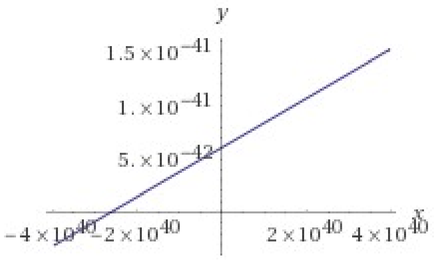
Input interpretation:

$$\frac{1}{2\pi}\times(2.62561\times10^{40}+x)/((2.62561\times10^{40})^2 - 2\times1.90431\times10^{-40}\times2.62561\times10^{40}+(-1.145774775557\times10^{20})^2)$$

Result:

$$2.30866\times10^{-82}\,(x+2.62561\times10^{40})$$

Plot:



(x from −3.9 × 10^40 to 3.9 × 10^40)

Geometric figure:

line

Alternate form:

$$2.30866\times10^{-82}\,x+6.06164\times10^{-42}$$

Root:

$x = -26\,256\,099\,999\,999\,997\,661\,706\,325\,792\,465\,457\,512\,448$

Integer root:

$x = -26\,256\,099\,999\,999\,997\,661\,706\,325\,792\,465\,457\,512\,448$

Properties as a real function:

Domain

ℝ (all real numbers)

Range

$\mathbb{R}$ (all real numbers)

Surjectivity

surjective onto $\mathbb{R}$

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

Derivative:

$$\frac{d}{dx}(2.30866\times10^{-82}\,(x+26\,256\,099\,999\,999\,997\,661\,706\,325\,792\,465\,457\,512\,448)) = 2.30866\times10^{-82}$$

Indefinite integral:

$$\int((2.62561\times10^{40}+x)/((2\pi)((2.62561\times10^{40})^2-2\,1.90431\times10^{-40}\,2.62561\times10^{40}+(-1.145774775557\times10^{20})^2)))\,dx = 1.15433\times10^{-82}\,x^2+6.06164\times10^{-42}\,x+\text{constant}$$

Definite integral after subtraction of diverging parts:

$$\int_0^{\infty}(2.30866\times10^{-82}\,(2.62561\times10^{40}+x)-(6.06164\times10^{-42}+2.30866\times10^{-82}\,x))\,dx = 0$$

Result:

$-2.6256099999999997661706325792465457512448\times10^{40}$

$-2.62560999\ldots*10^{40} = m$

Thence:

$$T_H = \frac{1}{2\pi}\frac{(r_+ + m)}{r_+^2 - 2\beta r_+ + a^2}$$

1/(2Pi)*((2.62561e+40)+(-2.625609999999e+40))/(((((2.62561e+40)^2-(2*1.90431e-40*2.62561e+40)+(-1.145774775557e+20)^2)))

Input interpretation:

$$\frac{1}{2\pi}\times(2.62561\times10^{40}-2.625609999999\times10^{40})/((2.62561\times10^{40})^2-2\times1.90431\times10^{-40}\times2.62561\times10^{40}+(-1.145774775557\times10^{20})^2)$$

Result:

$2.30866... \times 10^{-54}$

$2.30866*10^{-54}$

((((1/(2Pi)*((2.62561e+40)+(-2.625609999999e+40))/(((((2.62561e+40)^2-(2*1.90431e-40*2.62561e+40)+(-1.145774775557e+20)^2))))))))^1/2048

Input interpretation:

$$\left(\frac{1}{2\pi}\times(2.62561\times 10^{40}-2.625609999999\times 10^{40})/\left((2.62561\times 10^{40})^2-2\times 1.90431\times 10^{-40}\times 2.62561\times 10^{40}+(-1.145774775557\times 10^{20})^2\right)\right)\hat{}\,(1/2048)$$

Result:

0.941478126032570097150860406962716674916829330183207457169...

0.941478126….result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 (see Appendix) and to the value of the following Rogers-Ramanujan continued fraction:

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

From:

Astronomy & Astrophysics manuscript no. ms c ESO 2019 - September 24, 2019
Planck 2018 results. VI. Cosmological parameters

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

We know that α' is the Regge slope (string tension). With regard the Omega mesons, the values are:

ω	6	$m_{u/d} = 0 - 60$	0.910 – 0.918
ω/ω_3	5 + 3	$m_{u/d} = 255 - 390$	0.988 – 1.18
ω/ω_3	5 + 3	$m_{u/d} = 240 - 345$	0.937 – 1.000

1/16*log base 0.941478126((((1/(2Pi)*((2.62561e+40)+(-2.625609999999e+40))/(((((2.62561e+40)^2-(2*1.90431e-40*2.62561e+40)+(-1.145774775557e+20)^2)))))))-Pi+1/golden ratio

Input interpretation:

$$\frac{1}{16}\log_{0.941478126}\left(\frac{1}{2\pi}\times(2.62561\times10^{40}-2.625609999999\times10^{40})/\left((2.62561\times10^{40})^2-2\times1.90431\times10^{-40}\times2.62561\times10^{40}+(-1.145774775557\times10^{20})^2\right)\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.4764412617304468835898852604086515598353238092466896923...

125.4764412617… 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

Note that:

125.4764412617 GeV = K

Input interpretation:

convert

125.4764412617 GeV/k_B (gigaelectronvolts per Boltzmann constant) to kelvins

Result:

$1.45609363645\times10^{15}$ K (kelvins)

$1.45609363645*10^{15}$ K

Thence from a result as $2.30866*10^{-54}$, that tend to 0, we obtain the corresponding values: 125.4764412617 GeV = $1.45609363645*10^{15}$ K, i.e. a large number

Additional conversions:

$1.45609363645 \times 10^{15}$ °C (degrees Celsius)

$2.62096854561 \times 10^{15}$ °F (degrees Fahrenheit)

$2.62096854561 \times 10^{15}$ °R (degrees Rankine)

$1.16487490916 \times 10^{15}$ °Ré (degrees Réaumur)

$7.64449159136 \times 10^{14}$ °Rø (degrees Rømer)

Interpretations:

temperature

Basic unit dimensions:

[temperature]

Corresponding quantities:

Thermodynamic energy E from $E = kT$:

125 GeV (gigaelectronvolts)

Approximate luminous exitance from a planar blackbody radiator perpendicular to its surface:

2.973×10^{22} lx (lux)

Acceleration a needed to achieve given temperature as an Unruh temperature from $T = \hbar a/(2\pi ck)$:

3.591×10^{35} m/s^2 (meters per second squared)

Gravitational acceleration g needed to achieve given temperature as a Hawking temperature from $T = \hbar g/(2\pi ck)$:

3.591×10^{35} m/s^2 (meters per second squared)

1/16*log base 0.941478126((((1/(2Pi)*((2.62561e+40)+(-2.625609999999e+40))/(((((2.62561e+40)^2-(2*1.90431e-40*2.62561e+40)+(-1.145774775557e+20)^2))))))))+11+1/golden ratio

Input interpretation:

$$\frac{1}{16}\log_{0.941478126}\left(\frac{1}{2\pi}\times(2.62561\times10^{40}-2.625609999999\times10^{40})/((2.62561\times10^{40})^2-2\times1.90431\times10^{-40}\times2.62561\times10^{40}+(-1.145774775557\times10^{20})^2)\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.6180339153202401220525286436881544440324932086217955133...

139.618033915…. result practically equal to the rest mass of Pion meson 139.57 MeV

27*1/32*log base 0.941478126((((1/(2Pi)*((2.62561e+40)+(-2.625609999999e+40))/(((((2.62561e+40)^2-(2*1.90431e-40*2.62561e+40)+(-1.145774775557e+20)^2))))))))+1

Input interpretation:

$$27\times\frac{1}{32}\log_{0.941478126}\left(\frac{1}{2\pi}\times(2.62561\times10^{40}-2.625609999999\times10^{40})/((2.62561\times10^{40})^2-2\times1.90431\times10^{-40}\times2.62561\times10^{40}+(-1.145774775557\times10^{20})^2)\right)+1$$

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

Result:

1728.99999008699661196947214425853970405214484389016440791...

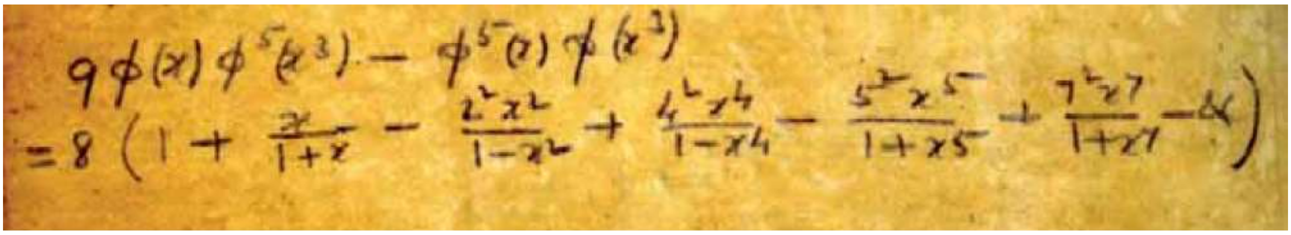
1728.99999… ≈ 1729

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

From

Manuscript Book I of Srinivasa Ramanujan

Now, we have that (page 211)



$$9\phi(x)\phi^5(x^3) - \phi^5(x)\phi(x^3) = 8\left(1 + \frac{x}{1+x} - \frac{2^2x^2}{1-x^2} + \frac{4^2x^4}{1-x^4} - \frac{5^2x^5}{1+x^5} + \frac{7^2x^7}{1+x^7} - \&c\right)$$

8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7)

Input:

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)$$

Exact result:

$$\frac{812296}{7095}$$

Decimal approximation:

114.4885130373502466525722339675828047921071176885130373502...

114.4885130735…..

8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7))+11

Input:

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11$$

Exact result:

$$\frac{890341}{7095}$$

Decimal approximation:

125.48851303735024665257223396758280479210711768851303735 02...

125.488513037… 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

8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7))+18+7

Input:

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+18+7$$

Exact result:

$$\frac{989671}{7095}$$

Decimal approximation:

139.48851303735024665257223396758280479210711768851303735 02...

139.488513…. result practically equal to the rest mass of Pion meson 139.57 MeV

400/(3Pi^2)*((8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7))+11+golden ratio^2))-golden ratio

Input:

$$\frac{400}{3\pi^2}\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)-\phi$$

ϕ is the golden ratio

Result:

$$\frac{400\left(\phi^2+\frac{890341}{7095}\right)}{3\pi^2}-\phi$$

Decimal approximation:

1729.0362296135530568107036724487095902269048530361416376 78...

1729.0362296…

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

Property:

$$-\phi+\frac{400\left(\frac{890341}{7095}+\phi^2\right)}{3\pi^2}$$ is a transcendental number

Alternate forms:

$$-\frac{-144157360-567600\sqrt{5}+4257\pi^2+4257\sqrt{5}\,\pi^2}{8514\pi^2}$$

$$\frac{567600\phi^2-4257\pi^2\phi+71227280}{4257\pi^2}$$

$$-\phi+\frac{400\phi^2}{3\pi^2}+\frac{71227280}{4257\pi^2}$$

Alternative representations:

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times2^2}{1-2^2}+\frac{4^2\times2^4}{1-2^4}-\frac{5^2\times2^5}{1+2^5}+\frac{7^2\times2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi=$$
$$2\cos(216\,°)+\frac{400\left(11+(-2\cos(216\,°))^2+8\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times4^2}{1-2^4}-\frac{2^5\times5^2}{1+2^5}+\frac{2^7\times7^2}{1+2^7}\right)\right)}{3\pi^2}$$

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times2^2}{1-2^2}+\frac{4^2\times2^4}{1-2^4}-\frac{5^2\times2^5}{1+2^5}+\frac{7^2\times2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi=$$
$$-2\cos\left(\frac{\pi}{5}\right)+\frac{400\left(11+\left(2\cos\left(\frac{\pi}{5}\right)\right)^2+8\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times4^2}{1-2^4}-\frac{2^5\times5^2}{1+2^5}+\frac{2^7\times7^2}{1+2^7}\right)\right)}{3\pi^2}$$

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times2^2}{1-2^2}+\frac{4^2\times2^4}{1-2^4}-\frac{5^2\times2^5}{1+2^5}+\frac{7^2\times2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi=$$
$$2\cos(216\,°)+\frac{400\left(11+(-2\cos(216\,°))^2+8\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times4^2}{1-2^4}-\frac{2^5\times5^2}{1+2^5}+\frac{2^7\times7^2}{1+2^7}\right)\right)}{3(180\,°)^2}$$

Series representations:

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi = -\phi+\frac{400\left(\frac{890341}{7095}+\phi^2\right)}{3\left(\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^2}$$

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi = -\phi+\frac{400\left(\frac{890341}{7095}+\phi^2\right)}{3\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{2}{1+4k}+\frac{2}{2+4k}+\frac{1}{3+4k}\right)\right)^2}$$

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi = -\phi+\frac{400\left(\frac{890341}{7095}+\phi^2\right)}{3\left(\sum_{k=0}^{\infty}16^{-k}\left(\frac{4}{1+8k}-\frac{2}{4+8k}-\frac{1}{5+8k}-\frac{1}{6+8k}\right)\right)^2}$$

Integral representations:

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi = -\phi+\frac{6400\left(\frac{890341}{7095}+\phi^2\right)}{27\left(\sqrt{3}+32\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)^2}$$

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi = \frac{36039340+141900\sqrt{5}-4257\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^2-4257\sqrt{5}\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^2}{8514\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^2}$$

$$\frac{\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+11+\phi^2\right)400}{3\pi^2}-\phi = \frac{36039340+141900\sqrt{5}-4257\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^2-4257\sqrt{5}\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^2}{8514\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^2}$$

2Pi*(8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7)))+7+golden ratio

Input:

$$2\pi\left(8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)\right)+7+\phi$$

ϕ is the golden ratio

Result:

$$\phi+7+\frac{1624592\,\pi}{7095}$$

Decimal approximation:

727.97057694586749553326487426619286146425277272731836552 72...

727.97057…≈ 728 (Ramanujan taxicab number)

Property:

$7+\phi+\frac{1624592\,\pi}{7095}$ is a transcendental number

Alternate forms:

$$\frac{106425+7095\sqrt{5}+3249184\,\pi}{14190}$$

$$\frac{7095\,\phi+49665+1624592\,\pi}{7095}$$

$$\frac{15}{2}+\frac{\sqrt{5}}{2}+\frac{1624592\,\pi}{7095}$$

Alternative representations:

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7-2\cos(216\,°)+16\,\pi\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times 4^2}{1-2^4}-\frac{2^5\times 5^2}{1+2^5}+\frac{2^7\times 7^2}{1+2^7}\right)$$

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7-2\cos(216\,°)+2880\,°\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times 4^2}{1-2^4}-\frac{2^5\times 5^2}{1+2^5}+\frac{2^7\times 7^2}{1+2^7}\right)$$

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7+2\cos\left(\frac{\pi}{5}\right)+16\,\pi\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times 4^2}{1-2^4}-\frac{2^5\times 5^2}{1+2^5}+\frac{2^7\times 7^2}{1+2^7}\right)$$

Series representations:

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7+\phi+\frac{6\,498\,368\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}{7095}$$

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7+\phi+\sum_{k=0}^{\infty}-\frac{6\,498\,368\,(-1)^k\,5^{-2(1+k)}\times 239^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1419\,(1+2k)}$$

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7+\phi+\frac{1\,624\,592\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)}{7095}$$

Integral representations:

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+7+\phi = 7+\phi+\frac{6\,498\,368}{7095}\int_0^1\sqrt{1-t^2}\,dt$$

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times2^2}{1-2^2}+\frac{4^2\times2^4}{1-2^4}-\frac{5^2\times2^5}{1+2^5}+\frac{7^2\times2^7}{1+2^7}\right)+7+\phi = 7+\phi+\frac{3249184}{7095}\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$(2\pi)\,8\left(1+\frac{2}{1+2}-\frac{2^2\times2^2}{1-2^2}+\frac{4^2\times2^4}{1-2^4}-\frac{5^2\times2^5}{1+2^5}+\frac{7^2\times2^7}{1+2^7}\right)+7+\phi = 7+\phi+\frac{3249184}{7095}\int_0^\infty\frac{1}{1+t^2}\,dt$$

(8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7)))+18+golden ratio^2

Input:

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times2^2}{1-2^2}+\frac{4^2\times2^4}{1-2^4}-\frac{5^2\times2^5}{1+2^5}+\frac{7^2\times2^7}{1+2^7}\right)+18+\phi^2$$

ϕ is the golden ratio

Result:

$$\phi^2+\frac{940006}{7095}$$

Decimal approximation:

135.1065470261001415007768208019484429098274268683188002123...

135.10654702… ≈ 135 (Ramanujan taxicab number) and result practically equal to the rest mass of Pion meson 134.9766 MeV

Alternate forms:

$$\frac{1901297+7095\sqrt{5}}{14190}$$

$$\frac{7095\,\phi^2 + 940\,006}{7095}$$

$$\frac{1\,901\,297}{14\,190} + \frac{\sqrt{5}}{2}$$

Alternative representations:

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 18 + \phi^2 = 18 + 8\left(\frac{5}{3} - -\frac{16}{3} + \frac{2^4 \times 4^2}{1-2^4} - \frac{2^5 \times 5^2}{1+2^5} + \frac{2^7 \times 7^2}{1+2^7}\right) + (2\sin(54\,°))^2$$

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 18 + \phi^2 = 18 + (-2\cos(216\,°))^2 + 8\left(\frac{5}{3} - -\frac{16}{3} + \frac{2^4 \times 4^2}{1-2^4} - \frac{2^5 \times 5^2}{1+2^5} + \frac{2^7 \times 7^2}{1+2^7}\right)$$

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 18 + \phi^2 = 18 + 8\left(\frac{5}{3} - -\frac{16}{3} + \frac{2^4 \times 4^2}{1-2^4} - \frac{2^5 \times 5^2}{1+2^5} + \frac{2^7 \times 7^2}{1+2^7}\right) + (-2\sin(666\,°))^2$$

(8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7)))+21+golden ratio^2

Input:

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 21 + \phi^2$$

ϕ is the golden ratio

Result:

$$\phi^2 + \frac{961\,291}{7095}$$

Decimal approximation:

138.1065470261001415007768208019484429098274268683188002123...

138.10654702… ≈ 138 (Ramanujan taxicab number)

Alternate forms:

$$\frac{1943867+7095\sqrt{5}}{14190}$$

$$\frac{7095\,\phi^2+961291}{7095}$$

$$\frac{1943867}{14190}+\frac{\sqrt{5}}{2}$$

Alternative representations:

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+21+\phi^2 = 21+8\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times 4^2}{1-2^4}-\frac{2^5\times 5^2}{1+2^5}+\frac{2^7\times 7^2}{1+2^7}\right)+(2\sin(54°))^2$$

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+21+\phi^2 = 21+(-2\cos(216°))^2+8\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times 4^2}{1-2^4}-\frac{2^5\times 5^2}{1+2^5}+\frac{2^7\times 7^2}{1+2^7}\right)$$

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+21+\phi^2 = 21+8\left(\frac{5}{3}--\frac{16}{3}+\frac{2^4\times 4^2}{1-2^4}-\frac{2^5\times 5^2}{1+2^5}+\frac{2^7\times 7^2}{1+2^7}\right)+(-2\sin(666°))^2$$

(8(1+2/(1+2)-(2^2*2^2)/(1-2^2)+(4^2*2^4)/(1-2^4)-(5^2*2^5)/(1+2^5)+(7^2*2^7)/(1+2^7)))+55+golden ratio^2

Input:

$$8\left(1+\frac{2}{1+2}-\frac{2^2\times 2^2}{1-2^2}+\frac{4^2\times 2^4}{1-2^4}-\frac{5^2\times 2^5}{1+2^5}+\frac{7^2\times 2^7}{1+2^7}\right)+55+\phi^2$$

ϕ is the golden ratio

Result:

$$\phi^2 + \frac{1202521}{7095}$$

Decimal approximation:

172.1065470261001415007768208019484429098274268683188002123...

172.10654702… ≈ 172 (Ramanujan taxicab number)

Alternate forms:

$$\frac{2426327 + 7095\sqrt{5}}{14190}$$

$$\frac{7095\,\phi^2 + 1202521}{7095}$$

$$\frac{2426327}{14190} + \frac{\sqrt{5}}{2}$$

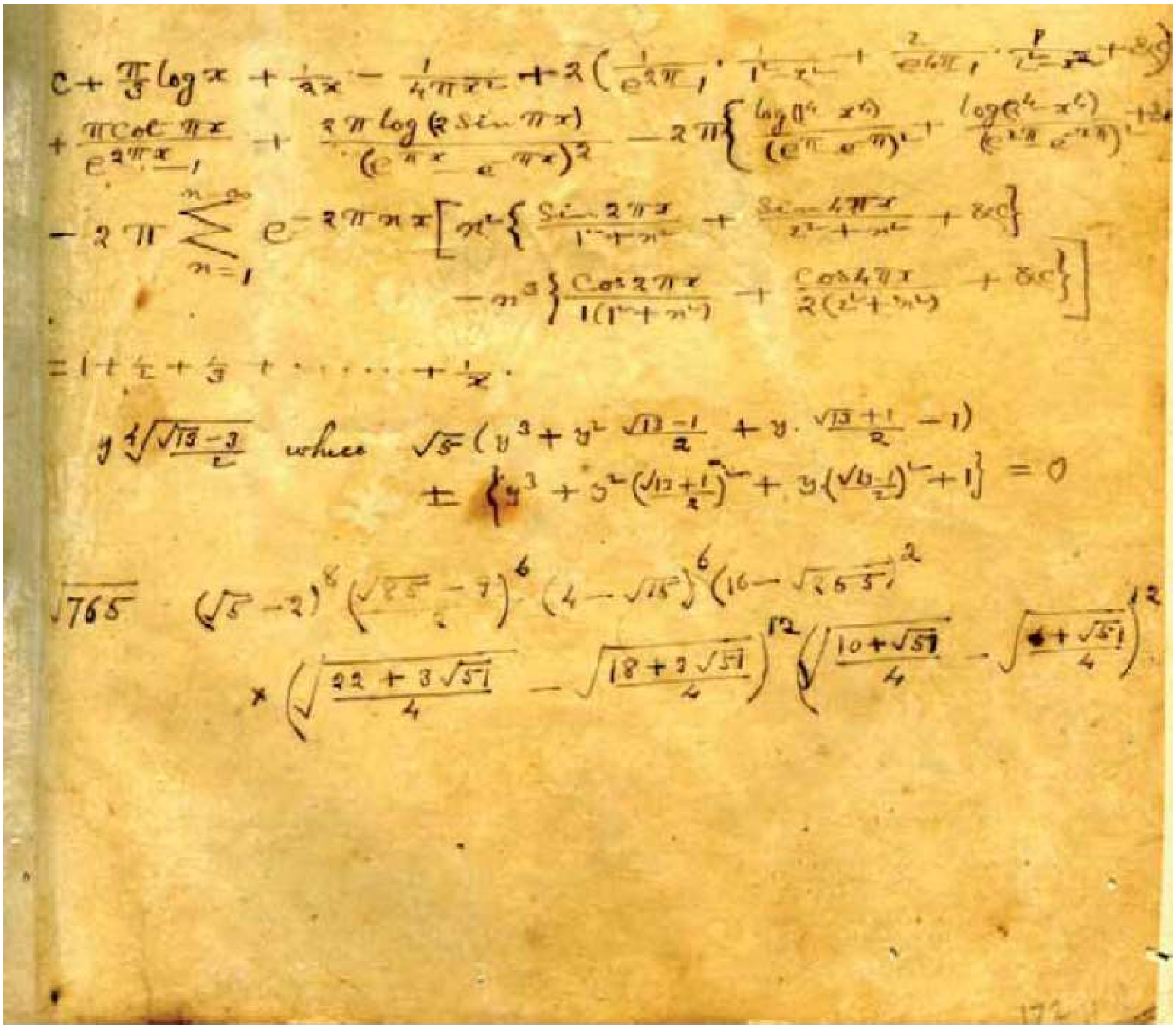
Alternative representations:

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 55 + \phi^2 = 55 + 8\left(\frac{5}{3} - -\frac{16}{3} + \frac{2^4 \times 4^2}{1-2^4} - \frac{2^5 \times 5^2}{1+2^5} + \frac{2^7 \times 7^2}{1+2^7}\right) + (2\sin(54°))^2$$

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 55 + \phi^2 = 55 + (-2\cos(216°))^2 + 8\left(\frac{5}{3} - -\frac{16}{3} + \frac{2^4 \times 4^2}{1-2^4} - \frac{2^5 \times 5^2}{1+2^5} + \frac{2^7 \times 7^2}{1+2^7}\right)$$

$$8\left(1 + \frac{2}{1+2} - \frac{2^2 \times 2^2}{1-2^2} + \frac{4^2 \times 2^4}{1-2^4} - \frac{5^2 \times 2^5}{1+2^5} + \frac{7^2 \times 2^7}{1+2^7}\right) + 55 + \phi^2 = 55 + 8\left(\frac{5}{3} - -\frac{16}{3} + \frac{2^4 \times 4^2}{1-2^4} - \frac{2^5 \times 5^2}{1+2^5} + \frac{2^7 \times 7^2}{1+2^7}\right) + (-2\sin(666°))^2$$

Now, we have that, page 330:



sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12

Input:

$$\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}$$

Exact result:

$$\frac{3}{64}\sqrt{85}\left(\sqrt{5}-2\right)^8\left(4-\sqrt{15}\right)^6\left(\sqrt{85}-9\right)^6\left(16-\sqrt{255}\right)^2 \left(\frac{\sqrt{10+\sqrt{51}}}{2}-\frac{1}{2}\sqrt{6+\sqrt{51}}\right)^{12}\left(\frac{1}{2}\sqrt{22+3\sqrt{51}}-\frac{1}{2}\sqrt{18+2\sqrt{51}}\right)^{12}$$

Decimal approximation:

1.251381269751669233712121031066244174707345707134016 1... × 10^{-29}

1.25138126…*10^{-29} this value tend to 0

1/((((sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12))))

Input:

$$1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)$$

Exact result:

$$64\Big/\left(3\sqrt{85}\left(\sqrt{5}-2\right)^8\left(4-\sqrt{15}\right)^6\left(\sqrt{85}-9\right)^6\left(16-\sqrt{255}\right)^2 \left(\frac{\sqrt{10+\sqrt{51}}}{2}-\frac{1}{2}\sqrt{6+\sqrt{51}}\right)^{12}\left(\frac{1}{2}\sqrt{22+3\sqrt{51}}-\frac{1}{2}\sqrt{18+2\sqrt{51}}\right)^{12}\right)$$

Decimal approximation:

7.991169631286277185588488513029245432199273452937990 3... × 10^{28}

7.99116963…*10^{28} this value is a large number (tend to ∞)

2ln(((1/((((sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12)))))))-5-2.618034

Input interpretation:

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.618034$$

log(x) is the natural logarithm

Result:

125.483405…

125.483405… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternative representations:

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803 =$$

$$-7.61803+2\log_e\left(1\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(\frac{1}{2}\left(-9+\sqrt{85}\right)\right)^6\left(16-\sqrt{255}\right)^2\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\sqrt{765}\right)\right)$$

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803=$$

$$-7.61803+2\log(a)\log_a\left(1\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(\frac{1}{2}\left(-9+\sqrt{85}\right)\right)^6\left(16-\sqrt{255}\right)^2\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\sqrt{765}\right)\right)$$

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803=$$

$$-7.61803-2\,\mathrm{Li}_1\left(1-1\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(\frac{1}{2}\left(-9+\sqrt{85}\right)\right)^6\left(16-\sqrt{255}\right)^2\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\sqrt{765}\right)\right)$$

Series representations:

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803 =$$

$$-7.61803+2\log\left(-1+64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)\right)-$$

$$2\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\left(-1+64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)\right)^{-k}$$

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803 =$$

$$-7.61803+4i\pi\left\lfloor\frac{1}{2\pi}\arg\left(-x+64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)\right)\right\rfloor+2\log(x)-$$

$$2\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k x^{-k}\left(-x+64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)\right)^{k} \quad \text{for } x<0$$

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803=$$

$$-7.61803+4i\pi\left\lfloor\frac{1}{2\pi}\left(\pi-\arg\left(64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}z_0\right)\right)-\arg(z_0)\right)\right\rfloor+$$

$$2\log(z_0)-2\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\left(64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)-z_0\right)^k z_0^{-k}$$

Integral representations:

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-5-2.61803=-7.61803+2\int_1^{\frac{64}{\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}}}\frac{1}{t}\,dt$$

$$2\log\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)-$$

$$5-2.61803=-7.61803+\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\Gamma(1-s)}\Gamma(-s)^2\,\Gamma(1+s)\left(-1+64\Big/\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12}\left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)\right)^{-s}ds\quad\text{for } -1<\gamma<0$$

and:

(((1/((((sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12)))))))^1/16

Input:

$$\left(1\Big/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)\hat{}\,(1/16)$$

Exact result:

$$2^{3/8}\Big/\left(\sqrt[16]{3}\,\sqrt[32]{85}\,\sqrt{\sqrt{5}-2}\,\left(\left(4-\sqrt{15}\right)\left(\sqrt{85}-9\right)\right)^{3/8}\sqrt[8]{16-\sqrt{255}}\left(\left(\frac{\sqrt{10+\sqrt{51}}}{2}-\frac{1}{2}\sqrt{6+\sqrt{51}}\right)\left(\frac{1}{2}\sqrt{22+3\sqrt{51}}-\frac{1}{2}\sqrt{18+2\sqrt{51}}\right)\right)^{3/4}\right)$$

Decimal approximation:

64.034370850185964488990622856211861640345597573494381664452...

64.03437085… ≈ 64

Alternate forms:

$$\left(2\times 2^{7/8}\right)/\left(\sqrt[16]{3}\ \sqrt[32]{85}\ \sqrt{\sqrt{5}-2}\ \left(-36+9\sqrt{15}-5\sqrt{51}+4\sqrt{85}\right)^{3/8}\sqrt[8]{16-\sqrt{255}}\ \left(\left(\sqrt{6+\sqrt{51}}-\sqrt{10+\sqrt{51}}\right)\left(\sqrt{2\left(9+\sqrt{51}\right)}-\sqrt{22+3\sqrt{51}}\right)\right)^{3/4}\right)$$

$$\left(4\sqrt[4]{2}\right)/\left(\sqrt[16]{3}\ \sqrt[32]{85}\ \sqrt{\sqrt{5}-2}\ \left(\left(4-\sqrt{15}\right)\left(\sqrt{85}-9\right)\right)^{3/8}\sqrt[8]{16-\sqrt{255}}\ \left(\left(\sqrt{6+\sqrt{51}}-\sqrt{10+\sqrt{51}}\right)\left(\sqrt{18-2\sqrt{30}}+\sqrt{2}\left(-3\sqrt{\frac{3}{2}}-\sqrt{\frac{17}{2}}+\sqrt{9+\sqrt{30}}\right)\right)\right)^{3/4}\right)$$

2(((1/((((sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12)))))))^1/16-Pi+0.618

Input:

$$2\left(1/\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6\left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12}\left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\right)\hat{}\,(1/16)-\pi+0.618$$

Result:

125.54515...

125.54515… 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 ((((sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12))))^1/4096

Input:

$$\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)\hat{}\,(1/4096)$$

Exact result:

$$\frac{1}{2^{3/2048}}\sqrt[4096]{3}\sqrt[8192]{85}\sqrt[512]{\sqrt{5}-2}\left(\left(4-\sqrt{15}\right)\left(\sqrt{85}-9\right)\right)^{3/2048}\sqrt[2048]{16-\sqrt{255}} \left(\left(\frac{\sqrt{10+\sqrt{51}}}{2}-\frac{1}{2}\sqrt{6+\sqrt{51}}\right)\left(\frac{1}{2}\sqrt{22+3\sqrt{51}}-\frac{1}{2}\sqrt{18+2\sqrt{51}}\right)\right)^{3/1024}$$

Decimal approximation:

0.9838835481478292664783934366392267019869925778740566808 81...

0.983883548… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

[log base 0.983883548((((sqrt765 (sqrt5-2)^8 ((sqrt85-9)/2)^6 (4-sqrt15)^6 (16-sqrt255)^2 ((sqrt(((22+3sqrt51)/4))-sqrt(((18+2sqrt51)/4))))^12 (((sqrt(((10+sqrt51)/4))-sqrt((6+sqrt51)/4))))^12))))]

Input interpretation:

$$\log_{0.983883548}\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)$$

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

Result:

4095.999962122277448960173118305862840676373851901832178996...

4095.99996212… ≈ 4096

Alternative representation:

$$\log_{0.983884}\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right) = \frac{1}{\log(0.983884)}\log\left(\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(\frac{1}{2}\left(-9+\sqrt{85}\right)\right)^6 \left(16-\sqrt{255}\right)^2\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12} \left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\sqrt{765}\right)$$

Series representations:

$$\log_{0.983884}\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right) = -\frac{1}{\log(0.983884)}\left(\sum_{k=1}^{\infty}\frac{1}{k}(-1)^k\left(-1+\frac{1}{64}\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6 \left(16-\sqrt{255}\right)^2\sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12} \left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)^k\right)$$

$$\log_{0.983884}\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right) = -61.5484\log\left(\frac{1}{64}\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2 \sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12} \left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right) - \log\left(\frac{1}{64}\left(-2+\sqrt{5}\right)^8\left(4-\sqrt{15}\right)^6\left(-9+\sqrt{85}\right)^6\left(16-\sqrt{255}\right)^2 \sqrt{765}\left(-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}\right)^{12} \left(-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}+\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}\right)^{12}\right)\sum_{k=0}^{\infty}(-0.0161165)^k G(k)$$

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

$$\log_{0.983884}\left(\sqrt{765}\left(\sqrt{5}-2\right)^8\left(\frac{1}{2}\left(\sqrt{85}-9\right)\right)^6\left(4-\sqrt{15}\right)^6 \left(16-\sqrt{255}\right)^2\left(\sqrt{\frac{1}{4}\left(22+3\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(18+2\sqrt{51}\right)}\right)^{12} \left(\sqrt{\frac{1}{4}\left(10+\sqrt{51}\right)}-\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)^{12}\right)=$$

$$\log_{0.983884}\left(\frac{1}{64}\sqrt{764}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^8\left(4-\sqrt{14}\sum_{k=0}^{\infty}14^{-k}\binom{\frac{1}{2}}{k}\right)^6 \left(-9+\sqrt{84}\sum_{k=0}^{\infty}84^{-k}\binom{\frac{1}{2}}{k}\right)^6\left(16-\sqrt{254}\sum_{k=0}^{\infty}254^{-k}\binom{\frac{1}{2}}{k}\right)^2\left(\sum_{k=0}^{\infty}764^{-k}\binom{\frac{1}{2}}{k}\right) \left(\sum_{k=0}^{\infty}4^k\binom{\frac{1}{2}}{k}\right)\left(-\left(2+\sqrt{51}\right)^{-k}\sqrt{\frac{1}{4}\left(2+\sqrt{51}\right)}+\left(6+\sqrt{51}\right)^{-k}\sqrt{\frac{1}{4}\left(6+\sqrt{51}\right)}\right)\right)^{12} \left(\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\right)\left(\left(\frac{4}{3}\right)^k\left(6+\sqrt{51}\right)^{-k}\sqrt{\frac{3}{4}\left(6+\sqrt{51}\right)}- 2^k\left(7+\sqrt{51}\right)^{-k}\sqrt{\frac{1}{2}\left(7+\sqrt{51}\right)}\right)\right)^{12}\right)$$

Integral representations:

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

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

2*sqrt(4095.99996212227)-Pi+1/golden ratio

Input interpretation:

$$2\sqrt{4095.99996212227}-\pi+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.476440743321...

125.476440743321... 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

Series representations:

$$2\sqrt{4095.999962122270000}-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi+2\sqrt{4094.999962122270000}\sum_{k=0}^{\infty}e^{-8.31752198703741884 0 k}\binom{\frac{1}{2}}{k}$$

$$2\sqrt{4095.999962122270000}-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi+2\sqrt{4094.999962122270000}\sum_{k=0}^{\infty}\frac{(-0.000244200246459035653 6)^k\left(-\frac{1}{2}\right)_k}{k!}$$

$$2\sqrt{4095.999962122270000}-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi+\frac{\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\, e^{-8.31752198703741884 0 s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}$$

2*sqrt(4095.99996212227)+11+1/golden ratio

Input interpretation:

$$2\sqrt{4095.99996212227}+11+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.618033396910...

139.61803339691… result practically equal to the rest mass of Pion meson 139.57 MeV

Series representations:

$$2\sqrt{4095.999962122270000}+11+\frac{1}{\phi}=11+\frac{1}{\phi}+2\sqrt{4094.999962122270000}\sum_{k=0}^{\infty}e^{-8.31752198703741884 0 k}\binom{\frac{1}{2}}{k}$$

$$2\sqrt{4095.999962122270000}+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\sqrt{4094.999962122270000}\sum_{k=0}^{\infty}\frac{(-0.000244200246459035653 6)^k\left(-\frac{1}{2}\right)_k}{k!}$$

$$2\sqrt{4095.999962122270000}+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}e^{-8.317521987037418840\,s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}$$

27*sqrt(4095.99996212227)+1

Input interpretation:

$$27\sqrt{4095.99996212227}+1$$

Result:

1728.99999201017...

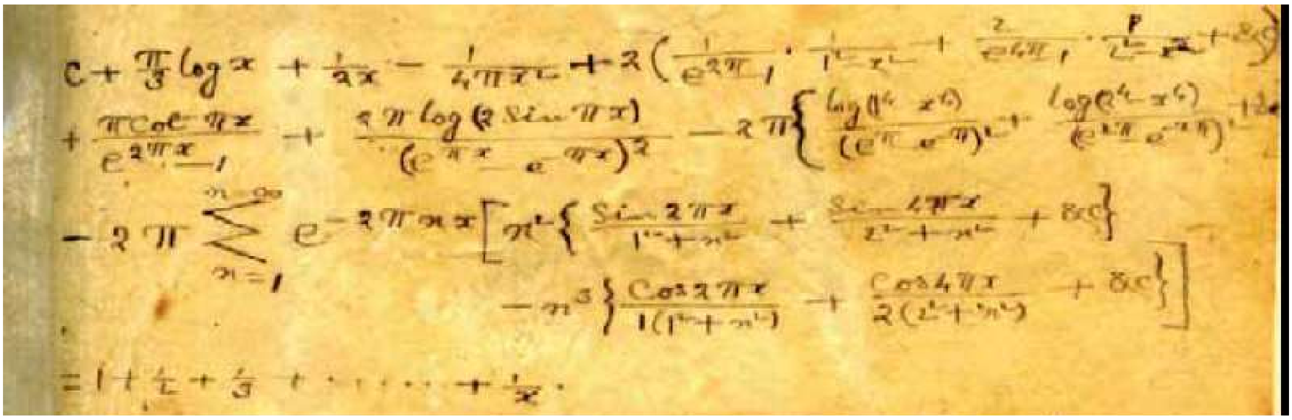
1728.99999201017... ≈ 1729

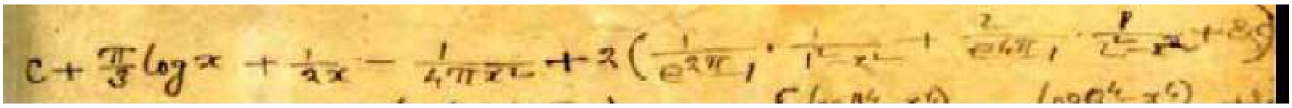
This result is very near to the mass of candidate glueball $f_0(1710)$ meson. Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. As a consequence, it is sometimes called a Zagier as a pun on the Gross–Zagier theorem. The number 1728 is one less than the Hardy–Ramanujan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

From Wikipedia:

*"The fundamental group of the complex form, compact real form, or any algebraic version of E_6 is the cyclic group **Z**/3**Z**, and its outer automorphism group is the cyclic group **Z**/2**Z**. Its fundamental representation is 27-dimensional (complex), and a basis is given by the 27 lines on a cubic surface. The dual representation, which is inequivalent, is also 27-dimensional. In particle physics, E_6 plays a role in some grand unified theories".*

We have that (page 330):





For x = 1/2 = 0.5 and C = 3

C + Pi/3 ln0.5 + 1/(2*0.5)- 1/(4Pi*0.5^2)+2((((1/(e^(2Pi)-1)*1/(1-0.5^2)+2/(e^(4Pi)-1)*1/(4-0.5^2))))

Input:

$$3+\frac{\pi}{3}\log(0.5)+\frac{1}{2\times 0.5}-\frac{1}{4\pi\times 0.5^2}+2\left(\frac{1}{e^{2\pi}-1}\times\frac{1}{1-0.5^2}+\frac{2}{e^{4\pi}-1}\times\frac{1}{4-0.5^2}\right)$$

log(x) is the natural logarithm

Result:

2.96082...

2.96082…

Alternative representations:

$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=$$
$$3+\frac{\pi\log_e(0.5)}{3}+\frac{1}{1}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(-1+e^{2\pi})}+\frac{2}{(4-0.5^2)(-1+e^{4\pi})}\right)$$

$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=3+$$
$$\frac{1}{3}\pi\log(a)\log_a(0.5)+\frac{1}{1}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(-1+e^{2\pi})}+\frac{2}{(4-0.5^2)(-1+e^{4\pi})}\right)$$

$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=$$
$$3-\frac{\pi\,\mathrm{Li}_1(0.5)}{3}+\frac{1}{1}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(-1+e^{2\pi})}+\frac{2}{(4-0.5^2)(-1+e^{4\pi})}\right)$$

Series representations:

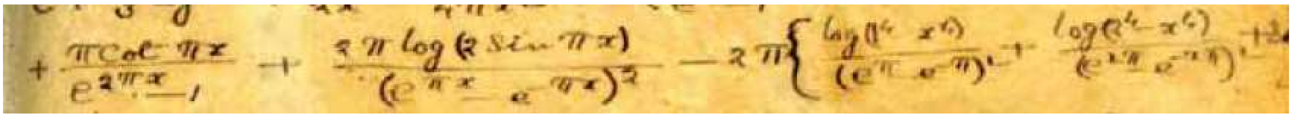
$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=$$
$$4+\frac{2.66667}{-1+e^{2\pi}}+\frac{1.06667}{-1+e^{4\pi}}-\frac{1}{\pi}-\frac{1}{3}\pi\sum_{k=1}^{\infty}\frac{(-1)^k(-0.5)^k}{k}$$

$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=$$
$$4+\frac{2.66667}{-1+e^{2\pi}}+\frac{1.06667}{-1+e^{4\pi}}-\frac{1}{\pi}-\frac{1}{3}\pi\sum_{k=1}^{\infty}\frac{(-1)^k(-0.5)^k}{k}$$

$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=$$
$$4+\frac{2.66667}{-1+e^{2\pi}}+\frac{1.06667}{-1+e^{4\pi}}-\frac{1}{\pi}+\frac{2}{3}i\pi^2\left\lfloor\frac{\arg(0.5-x)}{2\pi}\right\rfloor+$$
$$\frac{1}{3}\pi\log(x)-\frac{1}{3}\pi\sum_{k=1}^{\infty}\frac{(-1)^k(0.5-x)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representation:

$$3+\frac{1}{3}\log(0.5)\pi+\frac{1}{2\times 0.5}-\frac{1}{4\pi\,0.5^2}+2\left(\frac{1}{(1-0.5^2)(e^{2\pi}-1)}+\frac{2}{(4-0.5^2)(e^{4\pi}-1)}\right)=$$
$$4+\frac{2.66667}{-1+e^{2\pi}}+\frac{1.06667}{-1+e^{4\pi}}-\frac{1}{\pi}+\frac{\pi}{3}\int_1^{0.5}\frac{1}{t}\,dt$$



For x = 1/2

Pi*cot(Pi*0.5) / (e^(2Pi*0.5)-1) + 2Pi ln(2 sin(Pi*0.5))/(e^(Pi*0.5)-e^(-Pi*0.5))^2 – 2Pi((((ln(1-0.5^4)/(e^Pi-e^(-Pi))^2+ln(16-0.5^4)/(e^(2Pi)-e^(-2Pi))^2))))

Input:

$$\pi \times \frac{\cot(\pi \times 0.5)}{e^{2\pi\times 0.5}-1} + 2\pi \times \frac{\log(2\sin(\pi\times 0.5))}{\left(e^{\pi\times 0.5}-e^{-\pi\times 0.5}\right)^2} - 2\pi\left(\frac{\log(1-0.5^4)}{(e^{\pi}-e^{-\pi})^2} + \frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right)$$

cot(x) is the cotangent function

log(x) is the natural logarithm

Result:

0.206288...

0.206288…

Alternative representations:

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1} + \frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2} - 2\pi\left(\frac{\log(1-0.5^4)}{(e^{\pi}-e^{-\pi})^2} + \frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right) = \frac{\pi\left(i+\frac{2i}{-1+e^{i\pi}}\right)}{-1+e^{\pi}} + \frac{2\pi\log(2\cos(0))}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2} - 2\pi\left(\frac{\log(1-0.5^4)}{(-e^{-\pi}+e^{\pi})^2} + \frac{\log(16-0.5^4)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}\right)$$

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1} + \frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2} - 2\pi\left(\frac{\log(1-0.5^4)}{(e^{\pi}-e^{-\pi})^2} + \frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right) = -\frac{i(\pi\coth((-0.5\,i)\,\pi))}{-1+e^{\pi}} + \frac{2\pi\log(a)\log_a(2\sin(0.5\,\pi))}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2} - 2\pi\left(\frac{\log(a)\log_a(1-0.5^4)}{(-e^{-\pi}+e^{\pi})^2} + \frac{\log(a)\log_a(16-0.5^4)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}\right)$$

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2}-2\pi\left(\frac{\log(1-0.5^4)}{\left(e^{\pi}-e^{-\pi}\right)^2}+\frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right)=$$
$$\frac{\pi\left(i+\frac{2i}{-1+e^{i\pi}}\right)}{-1+e^{\pi}}+\frac{2\pi\log(a)\log_a(2\sin(0.5\pi))}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2}-$$
$$2\pi\left(\frac{\log(a)\log_a(1-0.5^4)}{\left(-e^{-\pi}+e^{\pi}\right)^2}+\frac{\log(a)\log_a(16-0.5^4)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}\right)$$

Integral representations:

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2}-2\pi\left(\frac{\log(1-0.5^4)}{\left(e^{\pi}-e^{-\pi}\right)^2}+\frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right)=$$
$$-\frac{\pi}{-1+e^{\pi}}\int_{\frac{\pi}{2}}^{0.5\pi}\csc^2(t)\,dt-\frac{2\pi\log(0.9375)}{\left(-e^{-\pi}+e^{\pi}\right)^2}-$$
$$\frac{2\pi\log(15.9375)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}+\frac{2\pi\log\left(\pi\int_0^1\cos(0.5\pi t)\,dt\right)}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2}$$

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2}-2\pi\left(\frac{\log(1-0.5^4)}{\left(e^{\pi}-e^{-\pi}\right)^2}+\frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right)=$$
$$-\frac{\pi}{-1+e^{\pi}}\int_{\frac{\pi}{2}}^{0.5\pi}\csc^2(t)\,dt-\frac{2\pi\log(0.9375)}{\left(-e^{-\pi}+e^{\pi}\right)^2}-\frac{2\pi\log(15.9375)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}+$$
$$\frac{2\pi\log\left(\frac{0.25\sqrt{\pi}}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\mathcal{A}^{-(0.0625\pi^2)/s+s}}{s^{3/2}}\,ds\right)}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2}\quad\text{for } \gamma>0$$

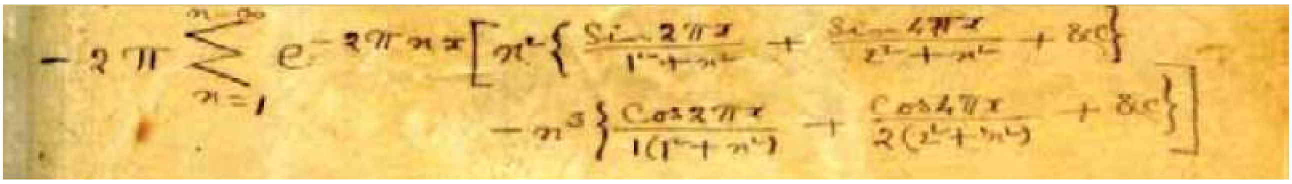
$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2}-2\pi\left(\frac{\log(1-0.5^4)}{\left(e^{\pi}-e^{-\pi}\right)^2}+\frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right)=$$
$$-\frac{\pi}{-1+e^{\pi}}\int_{\frac{\pi}{2}}^{0.5\pi}\csc^2(t)\,dt-\frac{2\pi\log(0.9375)}{\left(-e^{-\pi}+e^{\pi}\right)^2}-\frac{2\pi\log(15.9375)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}+$$
$$\frac{2\pi\log\left(\frac{\sqrt{\pi}}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{0.25\,e^{2.77259\,s}\,\pi^{1-2s}\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds\right)}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2}\quad\text{for } 0<\gamma<1$$

Multiple-argument formulas:

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{\left(e^{\pi\,0.5}-e^{-\pi\,0.5}\right)^2}-2\pi\left(\frac{\log(1-0.5^4)}{\left(e^{\pi}-e^{-\pi}\right)^2}+\frac{\log(16-0.5^4)}{\left(e^{2\pi}-e^{-2\pi}\right)^2}\right)=$$
$$-2\pi\left(\frac{\log(0.9375)}{\left(-e^{-\pi}+e^{\pi}\right)^2}+\frac{\log(15.9375)}{\left(-e^{-2\pi}+e^{2\pi}\right)^2}\right)+$$
$$\frac{2\pi(\log(2)+\log(\sin(0.5\pi)))}{\left(-e^{-0.5\pi}+e^{0.5\pi}\right)^2}+\frac{\pi(\cot(0.25\pi)-\tan(0.25\pi))}{2(-1+e^{\pi})}$$

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{(e^{\pi\,0.5}-e^{-\pi\,0.5})^2}-2\pi\left(\frac{\log(1-0.5^4)}{(e^{\pi}-e^{-\pi})^2}+\frac{\log(16-0.5^4)}{(e^{2\pi}-e^{-2\pi})^2}\right)=$$
$$\frac{\pi(-3\cot(0.166667\pi)+\cot^3(0.166667\pi))}{(-1+e^{\pi})(-1+3\cot^2(0.166667\pi))}-$$
$$2\pi\left(\frac{\log(0.9375)}{(-e^{-\pi}+e^{\pi})^2}+\frac{\log(15.9375)}{(-e^{-2\pi}+e^{2\pi})^2}\right)+\frac{2\pi(\log(2)+\log(\sin(0.5\pi)))}{(-e^{-0.5\pi}+e^{0.5\pi})^2}$$

$$\frac{\pi\cot(\pi\,0.5)}{e^{2\pi\,0.5}-1}+\frac{(2\pi)\log(2\sin(\pi\,0.5))}{(e^{\pi\,0.5}-e^{-\pi\,0.5})^2}-2\pi\left(\frac{\log(1-0.5^4)}{(e^{\pi}-e^{-\pi})^2}+\frac{\log(16-0.5^4)}{(e^{2\pi}-e^{-2\pi})^2}\right)=$$
$$\frac{\pi(-1+\cot(-0.5\pi)\cot(\pi))}{(-1+e^{\pi})(\cot(-0.5\pi)+\cot(\pi))}-$$
$$2\pi\left(\frac{\log(0.9375)}{(-e^{-\pi}+e^{\pi})^2}+\frac{\log(15.9375)}{(-e^{-2\pi}+e^{2\pi})^2}\right)+\frac{2\pi(\log(2)+\log(\sin(0.5\pi)))}{(-e^{-0.5\pi}+e^{0.5\pi})^2}$$



For x = 1/2 and n = 2

-2Pi* (e^(-2Pi*2*0.5))*(2^2(sin(2Pi*1/2)/(1+4)+sin(4Pi*0.5)/(4+4)-8((((cos(2Pi*0.5)/(1(1+4)))+((((cos(4Pi*0.5)/(2(4+4))))))))))

Input:

$$-2\pi e^{-2\pi\times2\times0.5}\left(2^2\left(\frac{\sin\left(2\pi\times\frac{1}{2}\right)}{1+4}+\frac{\sin(4\pi\times0.5)}{4+4}-8\left(\frac{\cos(2\pi\times0.5)}{1(1+4)}+\frac{\cos(4\pi\times0.5)}{2(4+4)}\right)\right)\right)$$

Result:

−0.0516274...

−0.05162735042901456149533991271596422600729620248329024148...

-0.0516273504…

Alternative representations:

$$-2\times2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi e^{-2\pi\,2\times0.5}=$$
$$-8\pi\left(\frac{1}{5}\cos\left(-\frac{\pi}{2}\right)+\frac{1}{8}\cos(-1.5\pi)-8\left(\frac{1}{5}\cosh(i\pi)+\frac{1}{16}\cosh(2i\pi)\right)\right)e^{-2\pi}$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$-8\pi\left(\frac{1}{5}\cos\left(-\frac{\pi}{2}\right)+\frac{1}{8}\cos(-1.5\pi)-8\left(\frac{1}{5}\cosh(-i\pi)+\frac{1}{16}\cosh((-2i)\pi)\right)\right)e^{-2\pi}$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$-8\pi\left(-\frac{1}{5}\cos\left(\frac{3\pi}{2}\right)-\frac{1}{8}\cos(2.5\pi)-8\left(\frac{1}{5}\cosh(-i\pi)+\frac{1}{16}\cosh((-2i)\pi)\right)\right)e^{-2\pi}$$

Series representations:

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\sum_{k=0}^{\infty}\frac{(-1)^k e^{-2\pi}\pi^{1+2k}\left(\left(-1.6-2e^{1.38629k}\right)\pi(2k)!+\left(12.8+4e^{1.38629k}\right)(1+2k)!\right)}{(2k)!(1+2k)!}$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\sum_{k=0}^{\infty}\frac{(-1)^k e^{-2\pi}\pi\left(\left(12.8+4e^{1.38629k}\right)\pi^{2k}-3.2J_{1+2k}(\pi)(2k)!-2J_{1+2k}(2\pi)(2k)!\right)}{(2k)!}$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\sum_{k=0}^{\infty}\frac{1}{5k!}2e^{-2\pi}\pi\left((-1)^{1+k}(8J_{1+2k}(\pi)+5J_{1+2k}(2\pi))k!+2\cos\left(\frac{k\pi}{2}+z_0\right)\left(16(\pi-z_0)^k+5(2\pi-z_0)^k\right)\right)$$

Integral representations:

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$16.8e^{-2\pi}\pi+\int_0^1 e^{-2\pi}\pi^2(-1.6\cos(\pi t)-2\cos(2\pi t)-12.8\sin(\pi t)-8\sin(2\pi t))\,dt$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\int_{\frac{\pi}{2}}^{2\pi} e^{-2\pi}\,\pi\,(-1.06667\cos(0-0.333333\pi+0.666667t)-$$
$$1.33333\cos(0-0.666667\pi+1.33333t)-$$
$$4.26667\sin(0+0.333333\pi+0.333333t)-4\sin(t))\,dt$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\int_0^1 e^{-2\pi}\,\pi^2\,(-1.6\cos(\pi t)-2\cos(2\pi t))\,dt+$$
$$\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-2\pi}\,\mathcal{A}^{-(1.25\pi^2)/s+s}\left(2\,\mathcal{A}^{(0.25\pi^2)/s}+6.4\,\mathcal{A}^{\pi^2/s}\right)\sqrt{\pi}}{i\sqrt{s}}\,ds \quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\frac{1}{5}e^{-2\pi}\,\pi\left(-84+128\cos^2(0.5\pi)+40\cos^2(\pi)-8\sin(\pi)-5\,U_1(\cos(\pi))\sin(\pi)\right)$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$\frac{2}{5}e^{-2\pi}\,\pi\left(-42+64\cos^2(0.5\pi)+20\cos^2(\pi)-8\cos\left(\frac{\pi}{2}\right)\sin\left(\frac{\pi}{2}\right)-5\cos(\pi)\sin(\pi)\right)$$

$$-2\times 2^2\left(\frac{\sin\left(\frac{2\pi}{2}\right)}{1+4}+\frac{\sin(4\pi\,0.5)}{4+4}-8\left(\frac{\cos(2\pi\,0.5)}{1(1+4)}+\frac{\cos(4\pi\,0.5)}{2(4+4)}\right)\right)\pi\,e^{-2\pi\,2\times 0.5}=$$
$$-\frac{2}{5}e^{-2\pi}\,\pi\left(-42+64\sin^2(0.5\pi)+8\cos\left(\frac{\pi}{2}\right)\sin\left(\frac{\pi}{2}\right)+5\cos(\pi)\sin(\pi)+20\sin^2(\pi)\right)$$

Thence, we obtain:

(2.96082096782292266455507130109+0.20628814922463399289199102-0.051627350429014561495339)

Input interpretation:

$$2.96082096782292266455507130109 + 0.206288149224633992891991102 - 0.051627350429014561495339$$

Result:

3.11548176661854209595172332109

3.1154817666....

1+1/((1/2(2.960820967822+0.206288149224-0.051627350429)))

Input interpretation:

$$1 + \frac{1}{\frac{1}{2}(2.960820967822 + 0.206288149224 - 0.051627350429)}$$

Result:

1.641955289685978404876901251679786569392353711077671497521...

$1.64195528... \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934 ...$

1/2(((2.960820967822+0.206288149224-0.051627350429)))^5-7

Input interpretation:

$$\frac{1}{2}(2.960820967822 + 0.206288149224 - 0.051627350429)^5 - 7$$

Result:

139.7560701878362354517579208507929104665428556881136454226...

139.75607018... result practically equal to the rest mass of Pion meson 139.57 MeV

1/2(((2.960820967822+0.206288149224-0.051627350429)))^5-21

Input interpretation:

$$\frac{1}{2}(2.960820967822 + 0.206288149224 - 0.051627350429)^5 - 21$$

Result:

125.756070187836235451757920850792910466542855688113645422 6...

125.75607018... 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

27*1/2((1/2(((2.960820967822+0.206288149224-0.051627350429)))^5-18))-8-1/golden ratio

Input interpretation:

$$27 \times \frac{1}{2}\left(\frac{1}{2}(2.960820967822 + 0.206288149224 - 0.051627350429)^5 - 18\right) - 8 - \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1729.58891355...

1729.58891355…

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:

$$\frac{27}{2}\left(\frac{1}{2}(2.9608209678220000 + 0.2062881492240000 - 0.0516273504290000)^5 - 18\right) - 8 - \frac{1}{\phi} = -8 + \frac{27}{2}\left(-18 + \frac{3.115481766617000^5}{2}\right) - \frac{1}{2\sin(54°)}$$

$$\frac{27}{2}\left(\frac{1}{2}(2.9608209678220000+0.2062881492240000-0.0516273504290000)^5-18\right)-8-\frac{1}{\phi}=-8+\frac{27}{2}\left(-18+\frac{3.115481766617000^5}{2}\right)--\frac{1}{2\cos(216°)}$$

$$\frac{27}{2}\left(\frac{1}{2}(2.9608209678220000+0.2062881492240000-0.0516273504290000)^5-18\right)-8-\frac{1}{\phi}=-8+\frac{27}{2}\left(-18+\frac{3.115481766617000^5}{2}\right)--\frac{1}{2\sin(666°)}$$

We note that $\frac{\pi^2}{6} = 1.644934$ ..., while from this expression, where the value is 3.1154817666...., we obtain:

1/6(((2.960820967822+0.206288149224-0.051627350429)))^2

Input interpretation:

$$\frac{1}{6}(2.960820967822+0.206288149224-0.051627350429)^2$$

Result:

1.617704439687163875937448166666666666666666666666666666...

Repeating decimal:

$1.61770443968716387593744816\overline{6}$ (period 1)

1.6177044396871... result that is a very good approximation to the value of the golden ratio 1,618033988749...

1/10^27* ((((1/6(((2.960820967822+0.206288149224-0.051627350429)))^2 + 55/10^3))))

Input interpretation:

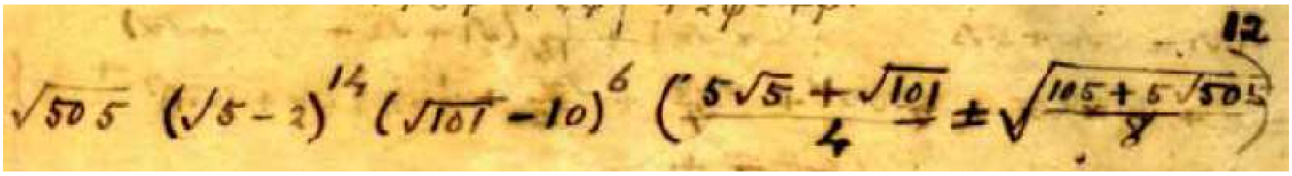
$$\frac{1}{10^{27}}\left(\frac{1}{6}(2.960820967822+0.206288149224-0.051627350429)^2+\frac{55}{10^3}\right)$$

Result:

$1.67270443968716387593744816666666666666666666666666... \times 10^{-27}$

$1.67270443968716...*10^{-27}$ result practically equal to the proton mass

Now, we have that (page 331):



$\sqrt{505}\,(\sqrt{5}-2)^{14}(\sqrt{101}-10)^{6}\left(\frac{5\sqrt{5}+\sqrt{101}}{4}\pm\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^{12}$

sqrt505 (sqrt5-2)^14 (sqrt101-10)^6 ((((1/4*(5sqrt5+sqrt101)+sqrt((1/8*105+5sqrt505)))))^12

Input:

$$\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{1}{8}\times 105+5\sqrt{505}}\right)^{12}$$

Result:

$$\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{105}{8}+5\sqrt{505}}\right)^{12}$$

Decimal approximation:

0.236775064412460098799348383170800838574530236659763229772...

0.23677506…

Alternate forms:

$$\frac{1}{16\,777\,216}\left(218\,643\,557\,581\,264\,400-97\,780\,371\,518\,819\,340\sqrt{5}-21\,755\,847\,119\,317\,740\sqrt{101}+9\,729\,510\,613\,377\,489\sqrt{505}\right)\left(\sqrt{10\left(21+8\sqrt{505}\right)}+5\sqrt{5}+\sqrt{101}\right)^{12}$$

$$\frac{\sqrt{505}\,(\sqrt{5}-2)^{14}\,(\sqrt{101}-10)^{6}\left(5\sqrt{5}+\sqrt{101}+\sqrt{10\,(21+8\sqrt{505})}\right)^{12}}{16\,777\,216}$$

$$\frac{1}{16\,777\,216}\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(5\sqrt{5}+\sqrt{101}+\sqrt{105-5\,i\sqrt{31\,879}}+\sqrt{5\,i\left(\sqrt{31\,879}+-21\,i\right)}\right)^{12}$$

7*((((sqrt505 (sqrt5-2)^14 (sqrt101-10)^6 ((((1/4*(5sqrt5+sqrt101)+sqrt((1/8*105+5sqrt505)))))^12)))))

Input:

$$7\left(\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{1}{8}\times 105+5\sqrt{505}}\right)^{12}\right)$$

Result:

$$7\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{105}{8}+5\sqrt{505}}\right)^{12}$$

Decimal approximation:

1.657425450887220691595438682195605870021711656618342608407...

1.657425450887… result very near to the 14th root of the following Ramanujan's class invariant $Q=\left(G_{505}/G_{101/5}\right)^{3}$ = 1164,2696 i.e. 1,65578...

Alternate forms:

$$\frac{1}{16777216}\left(218643557581264400-97780371518819340\sqrt{5}-21755847119317740\sqrt{101}+9729510613377489\sqrt{505}\right)\left(\sqrt{10\left(21+8\sqrt{505}\right)}+5\sqrt{5}+\sqrt{101}\right)^{12}7$$

$$\frac{7\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(5\sqrt{5}+\sqrt{101}+\sqrt{10\left(21+8\sqrt{505}\right)}\right)^{12}}{16777216}$$

$$\frac{1}{16777216}7\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(5\sqrt{5}+\sqrt{101}+\sqrt{105-5i\sqrt{31879}}+\sqrt{5i\left(\sqrt{31879}+-21i\right)}\right)^{12}$$

729*((((sqrt505 (sqrt5-2)^14 (sqrt101-10)^6 ((((1/4*(5sqrt5+sqrt101)+sqrt((1/8*105+5sqrt505)))))^12)))))

Where 729 = 9^3 (see Ramanujan cubes)

Input:

$$729\left(\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{1}{8}\times 105+5\sqrt{505}}\right)^{12}\right)$$

Result:

$$729\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{105}{8}+5\sqrt{505}}\right)^{12}$$

Decimal approximation:

172.60902195668341202472497133151381132083254252496739450 41...

172.60902195… ≈ 172 (Ramanujan taxicab number)

Alternate forms:

$$\frac{1}{16777216}\left(218643557581264400-97780371518819340\sqrt{5}-21755847119317740\sqrt{101}+9729510613377489\sqrt{505}\right)\left(\sqrt{10\left(21+8\sqrt{505}\right)}+5\sqrt{5}+\sqrt{101}\right)^{12}729$$

$$\frac{729\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(5\sqrt{5}+\sqrt{101}+\sqrt{10\left(21+8\sqrt{505}\right)}\right)^{12}}{16777216}$$

$$\frac{1}{16777216}729\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(5\sqrt{5}+\sqrt{101}+\sqrt{105-5i\sqrt{31879}}+\sqrt{5i\left(\sqrt{31879}+-21i\right)}\right)^{12}$$

(((729*((((sqrt505 (sqrt5-2)^14 (sqrt101-10)^6 ((((1/4*(5sqrt5+sqrt101)+sqrt((1/8*105+5sqrt505)))))^12)))))-34+1/golden ratio)))

Input:

$$729\left(\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{1}{8}\times 105+5\sqrt{505}}\right)^{12}\right)-34+\frac{1}{\phi}$$

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi} - 34 + 729 \sqrt{505} \left(\sqrt{5} - 2\right)^{14} \left(\sqrt{101} - 10\right)^{6} \left(\frac{1}{4}\left(5\sqrt{5} + \sqrt{101}\right) + \sqrt{\frac{105}{8} + 5\sqrt{505}}\right)^{12}$$

Decimal approximation:

139.2270559454333068729295581658794494385528517047731573662...

139.227055945… result practically equal to the rest mass of Pion meson 139.57 MeV

(((729*((((sqrt505 (sqrt5-2)^14 (sqrt101-10)^6 ((((1/4*(5sqrt5+sqrt101)+sqrt((1/8*105+5sqrt505)))))^12)))))-47-2+golden ratio)))

Input:

$$729 \left(\sqrt{505} \left(\sqrt{5} - 2\right)^{14} \left(\sqrt{101} - 10\right)^{6} \left(\frac{1}{4}\left(5\sqrt{5} + \sqrt{101}\right) + \sqrt{\frac{1}{8} \times 105 + 5\sqrt{505}}\right)^{12}\right) - 47 - 2 + \phi$$

ϕ is the golden ratio

Exact result:

$$\phi - 49 + 729 \sqrt{505} \left(\sqrt{5} - 2\right)^{14} \left(\sqrt{101} - 10\right)^{6} \left(\frac{1}{4}\left(5\sqrt{5} + \sqrt{101}\right) + \sqrt{\frac{105}{8} + 5\sqrt{505}}\right)^{12}$$

Decimal approximation:

125.2270559454333068729295581658794494385528517047731573662...

125.227055945… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

1/2*27*((((((729*((((sqrt505 (sqrt5-2)^14 (sqrt101-10)^6 ((((1/4*(5sqrt5+sqrt101)+sqrt((1/8*105+5sqrt505)))))^12)))))-47+golden ratio^2))))))-2

Input:

$$\frac{1}{2}\times 27\left(729\left(\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{1}{8}\times 105+5\sqrt{505}}\right)^{12}\right)-47+\phi^2\right)-2$$

ϕ is the golden ratio

Exact result:

$$\frac{27}{2}\left(\phi^2-47+729\sqrt{505}\left(\sqrt{5}-2\right)^{14}\left(\sqrt{101}-10\right)^{6}\left(\frac{1}{4}\left(5\sqrt{5}+\sqrt{101}\right)+\sqrt{\frac{105}{8}+5\sqrt{505}}\right)^{12}\right)-2$$

Decimal approximation:

1729.065255263349642784549035239372567420463498014437624444...

1729.06525526.....

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

Conclusions

Note that:

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

Hence

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

so that

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

Hence

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

Thence:

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

And

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

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

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

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.

“For this reason Ramanujan elaborated a theory of reality around Zero (representing absolute Reality) and Infinity (the manifold manifestations of that reality): their mathematical product represented all the numbers, each of which corresponded to individual acts of creation. For him, "the numbers and their mathematical ratios let us understand how everything was in harmony in the universe".”

(https://www.cittanuova.it/ramanujanhardy-e-il-piacere-di-scoprire/?ms=006&se=007)

References

Dark Spinors Hawking Radiation in String Theory Black Holes

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