On the Ramanujan's mathematics (Rogers-Ramanujan continued fractions, Hardy-Ramanujan number and sixth order mock theta functions) applied to various parameters of Particle Physics: New possible mathematical connections II.

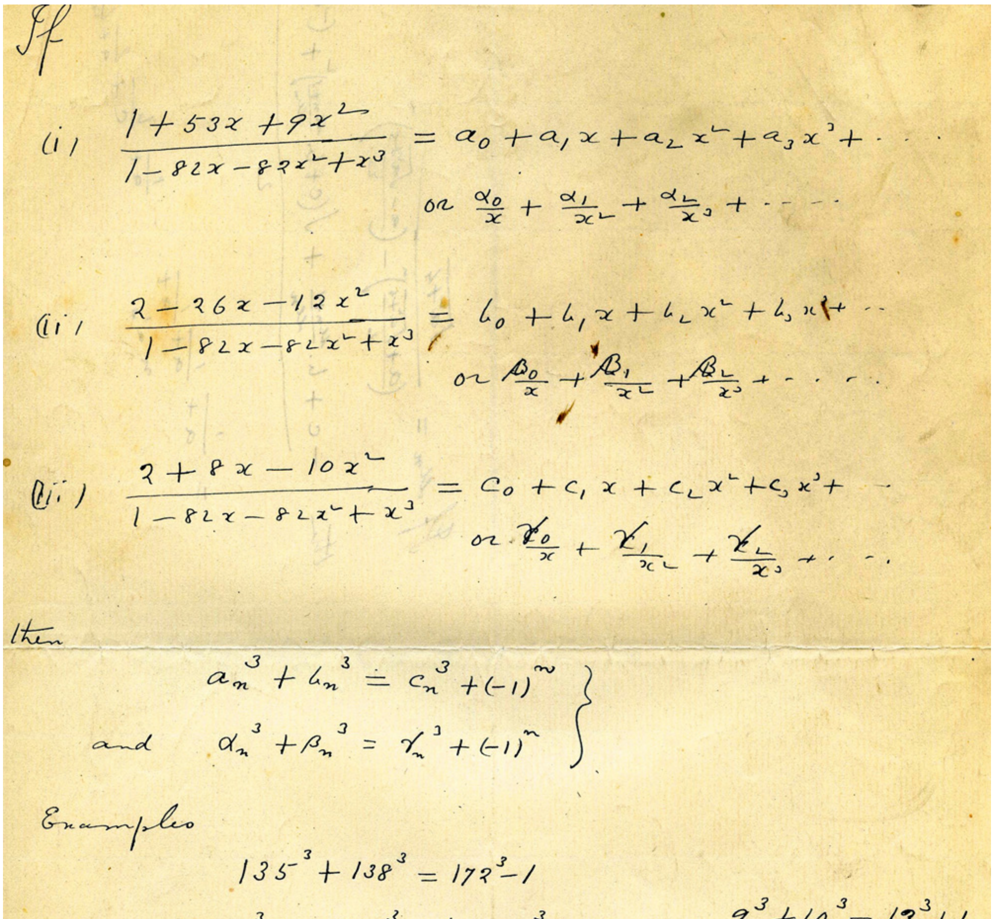
Michele Nardelli[1], Antonio Nardelli

Abstract

In this research thesis, we have analyzed and deepened further Ramanujan expressions (Rogers-Ramanujan continued fractions, Hardy-Ramanujan number and sixth order mock theta functions) applied to various parameters of Particle Physics. We have therefore described new possible mathematical connections.

[1] M.Nardelli studied at Dipartimento di Scienze della Terra Università degli Studi di Napoli Federico II, Largo S. Marcellino, 10 - 80138 Napoli, Dipartimento di Matematica ed Applicazioni "R. Caccioppoli" - Università degli Studi di Napoli "Federico II" – Polo delle Scienze e delle Tecnologie Monte S. Angelo, Via Cintia (Fuorigrotta), 80126 Napoli, Italy

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



If

(i) $\dfrac{1+53x+9x^2}{1-82x-82x^2+x^3} = a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots$

or $\dfrac{\alpha_0}{x} + \dfrac{\alpha_1}{x^2} + \dfrac{\alpha_2}{x^3} + \cdots$

(ii) $\dfrac{2-26x-12x^2}{1-82x-82x^2+x^3} = b_0 + b_1x + b_2x^2 + b_3x^3 + \cdots$

or $\dfrac{\beta_0}{x} + \dfrac{\beta_1}{x^2} + \dfrac{\beta_2}{x^3} + \cdots$

(iii) $\dfrac{2+8x-10x^2}{1-82x-82x^2+x^3} = c_0 + c_1x + c_2x^2 + c_3x^3 + \cdots$

or $\dfrac{\gamma_0}{x} + \dfrac{\gamma_1}{x^2} + \dfrac{\gamma_2}{x^3} + \cdots$

then

$$a_n^3 + b_n^3 = c_n^3 + (-1)^n$$

and

$$\alpha_n^3 + \beta_n^3 = \gamma_n^3 + (-1)^n$$

Examples

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

$11161^3 + 11468^3 = 14258^3 + 1$

$791^3 + 812^3 = 1010^3 - 1$

$9^3 + 10^3 = 12^3 + 1$

$6^3 + 8^3 = 9^3 - 1$

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

Ramanujan's manuscript

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

From Wikipedia

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

From:

Ramanujan's "Lost" Notebook VII: The Sixth Order Mock Theta Functions
GEORGE E. ANDREWS AND DEAN HICKERSON - ADVANCES IN MATHEMATICS 89, 60-105 (1991)

From:

$$A'_n(1, -1, -q^{-1}, q^2) = \frac{2(-1)^n q^{n^2+n-1}(1+q)}{1+q^{2n-1}} + q^{2n^2-n}(1-q^{2n})\left[\frac{1-q}{1+q} + 2\sum_{j=1}^{n-1} \frac{(-1)^j(1-q^2)}{q^{(j-1)^2}(1+q^{2j-1})(1+q^{2j+1})}\right].$$

For j = 3 and n = 5, we obtain:

(((2(-1)^5*0.5^29 * (1+0.5))))/((((1+0.5^9))))+0.5^45*(1-0.5^10)*[(1-0.5)/(1+0.5)+2*(((-1)^3*(1-0.5^2)))/((0.5^4 * (1+0.5^5)(1+0.5^7)))]

Input:

$$\frac{2(-1)^5 \times 0.5^{29}(1+0.5)}{1+0.5^9}+0.5^{45}\left(1-0.5^{10}\right)\left(\frac{1-0.5}{1+0.5}+2\times\frac{(-1)^3\left(1-0.5^2\right)}{0.5^4\left(1+0.5^5\right)\left(1+0.5^7\right)}\right)$$

Result:

$-5.577689003577036611760292646743526397781859737309601... \times 10^{-9}$

$-5.577689003577...*10^{-9}$

Now, we have that:

$$A'_n(1,-1,-q^{-1},q^2) = \frac{2(-1)^n q^{n^2+n-1}(1+q)}{1+q^{2n-1}} + q^{2n^2-n}(1-q^{2n})\left[-1-2\sum_{j=1}^{n-1}(-1)^j q^{-j^2}-\frac{2(-1)^n}{q^{(n-1)^2}(1+q^{2n-1})}\right]$$

For j = 3, q = 0.5 and n = 5, we obtain:

(((2(-1)^5*0.5^29 (1+0.5))) / (((1+0.5^9))) + 0.5^45(1-0.5^10)*[-1-2*(-1)^3*0.5^9-((2(-1)^5))/((0.5^16*(1+0.5^9)))]

Input:

$$\frac{2(-1)^5 \times 0.5^{29}(1+0.5)}{1+0.5^9}+0.5^{45}\left(1-0.5^{10}\right)\left(-1-2(-1)^3\times 0.5^9-\frac{2(-1)^5}{0.5^{16}\left(1+0.5^9\right)}\right)$$

Result:

$-1.862673432270929574361417735417489893734455108642578... \times 10^{-9}$

-1.86267343227e-9

From which:

((((-1/4096*1/(((((((2(-1)^5*0.5^29 (1+0.5))) / (((1+0.5^9))) + 0.5^45(1-0.5^10)*[-1-2*(-1)^3*0.5^9-((2(-1)^5))/((0.5^16*(1+0.5^9)))]))))))))^1/2 - 256 + 32 - 1/golden ratio

Input:

$$\sqrt{-\frac{\frac{1}{\frac{2(-1)^5\times 0.5^{29}(1+0.5)}{1+0.5^9}+0.5^{45}(1-0.5^{10})\left(-1-2(-1)^3\times 0.5^9-\frac{2(-1)^5}{0.5^{16}(1+0.5^9)}\right)}}{4096}}-256+32-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

137.41788935065528024683552702216485394920672408622828518 24...

137.417889…

This result is very near to the inverse of fine-structure constant 137,035

And.

1/(((((((-1/4096*1/(((((((2(-1)^5*0.5^29 (1+0.5))) / (((1+0.5^9))) + 0.5^45(1-0.5^10)*[-1-2*(-1)^3*0.5^9-((2(-1)^5))/((0.5^16*(1+0.5^9)))]))))))))^1/2 - 256 + 32 - 1/golden ratio)))

Input:

$$\frac{1}{\sqrt{-\frac{\frac{1}{\frac{2(-1)^5\times 0.5^{29}(1+0.5)}{1+0.5^9}+0.5^{45}(1-0.5^{10})\left(-1-2(-1)^3\times 0.5^9-\frac{2(-1)^5}{0.5^{16}(1+0.5^9)}\right)}}{4096}}-256+32-\frac{1}{\phi}}$$

ϕ is the golden ratio

Result:

0.00727707...

0.0072707...

This result is very near to the fine-structure constant

We have also:

27*1/2*((((-1/4096*1/((((2(-1)^5*0.5^29 (1+0.5))) / (((1+0.5^9))) + 0.5^45(1-0.5^10)*((-1-2*(-1)^3*0.5^9-((2(-1)^5))/((0.5^16*(1+0.5^9))))))))^1/2 - (233+1.618) + 0.6556795424)))

Where 0.6556795424 is the following Rogers-Ramanujan continued fraction:

$$\sqrt{\frac{e\pi}{2}}\,erfc\left(\frac{\sqrt{2}}{2}\right) \approx 0.6556795424$$

27*1/2*((((-1/4096*1/((((2(-1)^5*0.5^29 (1+0.5))) / (((1+0.5^9))) + 0.5^45(1-0.5^10)*((-1-2*(-1)^3*0.5^9-((2(-1)^5))/((0.5^16*(1+0.5^9))))))))^1/2 - (233+1.618) + ((sqrt((e*Pi)/2))erfc(sqrt2/2)))))

Input:

$$27\times\frac{1}{2}\left(\sqrt{-\frac{\frac{1}{\frac{2(-1)^5\times 0.5^{29}(1+0.5)}{1+0.5^9}+0.5^{45}(1-0.5^{10})\left(-1-2(-1)^3\times 0.5^9-\frac{2(-1)^5}{0.5^{16}(1+0.5^9)}\right)}}{4096}}-(233+1.618)+\sqrt{\frac{e\,\pi}{2}}\,\text{erfc}\left(\frac{\sqrt{2}}{2}\right)\right)$$

erfc(x) is the complementary error function

Result:

1728.99…

1728.99…

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 (taxicab number)

Now, we have:

$$A'_n(q^2, -1, 0, q) = \frac{2q^{3n(n+1)/2}(1+q^{n+1})(1-q^{2n+2})}{(1-q)(1-q^2)} \times \sum_{j=0}^{n} \frac{(-1)^j(1-q^{2j+1})}{q^{j^2+j}(1+q^j)(1+q^{j+1})}.$$

For j = 3, q = 0.5 and n = 5, we obtain:

(((2*0.5^(15(5+1)/2)*(1+0.5^6)(1-0.5^12))))/(((1-0.5)(1-0.5^2))) * ((((-1)^3*(1-0.5^7))))/ ((((0.5^12(1+0.5^3)(1+0.5^4))))

Input:

$$\frac{2\times 0.5^{15\times(5+1)/2}(1+0.5^6)(1-0.5^{12})}{(1-0.5)(1-0.5^2)} \times \frac{(-1)^3(1-0.5^7)}{0.5^{12}(1+0.5^3)(1+0.5^4)}$$

Result:

$-5.232973096241824118895273582608092064950980392156862... \times 10^{-10}$

-5.23297309624e-10

From these three results, we obtain:

[-(1 / -5.5776890035e-9 * 1 / -1.8626734322e-9 * 1/ -5.2329730962e-10)]^1/8 - 55

Input interpretation:

$$\sqrt[8]{-\left(-\frac{1}{5.5776890035\times 10^{-9}}\left(-\frac{1}{1.8626734322\times 10^{-9}}\right)\left(-\frac{1}{5.2329730962\times 10^{-10}}\right)\right)}-55$$

Result:

1864.0335183...

1864.0335183... result practically equal to the rest mass of D meson 1864.84

[-(-5.5776890035e-9 / -1.8626734322e-9 / -5.2329730962e-10)]^1/3 -55-5+1/golden ratio

Input interpretation:

$$\sqrt[3]{-\left(-\frac{\frac{-5.5776890035\times10^{-9}}{-1.8626734322\times10^{-9}}}{5.2329730962\times10^{-10}}\right)}-55-5+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1729.2583868...

1729.2583868…

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 (taxicab number)

10^27((π^(1/2 - e/2) sqrt(-cos(e π)))) [-(-5.5776890035e-9 * -1.8626734322e-9 * -5.2329730962e-10)]

Input interpretation:

$$10^{27}\left(\pi^{1/2-e/2}\sqrt{-\cos(e\,\pi)}\right)\left(-\left(-5.5776890035\times10^{-9}\left(-1.8626734322\times10^{-9}\right)\left(-5.2329730962\times10^{-10}\right)\right)\right)$$

Result:

1.6181070818062184937461813841203416608736496547586219313 78...

1.618107081806… result that is a very good approximation to the value of the golden ratio 1,618033988749...

And:

[-(-5.5776890035e-9 * -1.8626734322e-9 * -5.2329730962e-10)]^1/4096

Input interpretation:

$$\sqrt[4096]{-(-5.5776890035\times10^{-9}\,(-1.8626734322\times10^{-9})\,(-5.2329730962\times10^{-10}))}$$

Result:

0.98534366640817...

0.98534366640817… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

27*sqrt(((log base 0.98534366640817[-(-5.5776890035e-9 * -1.8626734322e-9 * -5.2329730962e-10)])))+1

Input interpretation:

$$27\sqrt{\log_{0.98534366640817}(-(-5.5776890035\times10^{-9}\,(-1.8626734322\times10^{-9})\,(-5.2329730962\times10^{-10})))}+1$$

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

Result:

1729.00000000...

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 (taxicab number)

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".*

2sqrt(((log base 0.98534366640817[-(-5.5776890035e-9 * -1.8626734322e-9 * -5.2329730962e-10)])))+8+golden ratio

Input interpretation:

$$2\sqrt{\log_{0.98534366640817}\left(-\left(-5.5776890035\times10^{-9}\right)\left(-1.8626734322\times10^{-9}\right)\left(-5.2329730962\times10^{-10}\right)\right)}+8+\phi$$

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

ϕ is the golden ratio

Result:

137.618033989...

137.618033989…

This result is very near to the inverse of fine-structure constant 137,035

2sqrt(((log base 0.98534366640817[-(-5.5776890035e-9 * -1.8626734322e-9 * -5.2329730962e-10)])))+11+1/golden ratio

Input interpretation:

$$2\sqrt{\log_{0.98534366640817}\left(-\left(-5.5776890035\times 10^{-9}\left(-1.8626734322\times 10^{-9}\right)\left(-5.2329730962\times 10^{-10}\right)\right)\right)}+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618033989...

139.618033989… result practically equal to the rest mass of Pion meson 139.57 MeV

2sqrt(((log base 0.98534366640817[-(-5.5776890035e-9 * -1.8626734322e-9 * -5.2329730962e-10)])))-Pi+1/golden ratio

Input interpretation:

$$2\sqrt{\log_{0.98534366640817}\left(-\left(-5.5776890035\times 10^{-9}\left(-1.8626734322\times 10^{-9}\right)\left(-5.2329730962\times 10^{-10}\right)\right)\right)}-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476441335...

125.476441335… 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 that: (page 86)

$$J_1\phi(q)=1+2\sum_{r\geqslant 1}\frac{q^{r(6r+1)}}{1-q^r+q^{2r}}-2\sum_r\frac{q^{(r+1)(6r+4)}-q^{(2r+3)(3r+2)}}{1-q^{6r+4}}$$

$$=1+2\sum_{r\geqslant 1}\frac{q^{r(6r+1)}}{1-q^r+q^{2r}}-2\sum_r\frac{q^{(r+1)(6r+4)}}{1+q^{3r+2}}.$$

For q = 0.5 and r = 1, we obtain:

1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2)))

Input:

$$1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}$$

Result:

1.020831483783143939393939393939393939393939393939393939...

1.0208314837…

Repeating decimal:

$1.02083148378314\overline{39}$ (period 2)

[1/(((1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2))))))]^1/24

Input:

$$\sqrt[24]{\frac{1}{1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}}}$$

Result:

0.99914131...

0.99914131… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

5log base 0.99914131[1/(((1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2)))))))]+5+1/golden ratio

Input interpretation:

$$5 \log_{0.99914131}\left(\frac{1}{1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+5+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.618...

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

Alternative representation:

$$5 \log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+5+\frac{1}{\phi}=5+\frac{1}{\phi}+\frac{5\log\left(\frac{1}{1+\frac{2\times 0.5^7}{0.5+0.5^2}-\frac{2\times 0.5^{20}}{1+0.5^5}}\right)}{\log(0.999141)}$$

Series representations:

$$5 \log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+5+\frac{1}{\phi}=5+\frac{1}{\phi}-\frac{5\sum_{k=1}^{\infty}\frac{(-1)^k(-0.0204064)^k}{k}}{\log(0.999141)}$$

$$5 \log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+5+\frac{1}{\phi}=$$
$$5+\frac{1}{\phi}-5820.32\log(0.979594)-5\log(0.979594)\sum_{k=0}^{\infty}(-0.00085869)^k\,G(k)$$
$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

5log base 0.99914131[1/(((1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2))))))]+18+golden ratio

Input interpretation:

$$5\log_{0.99914131}\left(\frac{1}{1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18+\phi$$

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

ϕ is the golden ratio

Result:

139.618...

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

Alternative representation:

$$5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18+\phi=18+\phi+\frac{5\log\left(\frac{1}{1+\frac{2\times 0.5^7}{0.5+0.5^2}-\frac{2\times 0.5^{20}}{1+0.5^5}}\right)}{\log(0.999141)}$$

Series representations:

$$5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18+\phi=18+\phi-\frac{5\sum_{k=1}^{\infty}\frac{(-1)^k(-0.0204064)^k}{k}}{\log(0.999141)}$$

$$5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18+\phi =$$

$$18+\phi-5820.32\log(0.979594)-5\log(0.979594)\sum_{k=0}^{\infty}(-0.00085869)^k\,G(k)$$

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

5log base 0.99914131[1/(((1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2))))))]+18-1/golden ratio

Input interpretation:

$$5\log_{0.99914131}\left(\frac{1}{1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

137.382...

137.382…

This result is very near to the inverse of fine-structure constant 137,035

Alternative representation:

$$5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}=18-\frac{1}{\phi}+\frac{5\log\left(\frac{1}{1+\frac{2\times 0.5^7}{0.5+0.5^2}-\frac{2\times 0.5^{20}}{1+0.5^5}}\right)}{\log(0.999141)}$$

Series representations:

$$5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}=18-\frac{1}{\phi}-\frac{5\sum_{k=1}^{\infty}\frac{(-1)^k(-0.0204064)^k}{k}}{\log(0.999141)}$$

$$5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}=$$
$$18-\frac{1}{\phi}-5820.32\log(0.979594)-5\log(0.979594)\sum_{k=0}^{\infty}(-0.00085869)^k\,G(k)$$
$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}G(-j+k)}{1+j}\right)$$

1/(((5log base 0.99914131[1/(((1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2))))))]+18-1/golden ratio)))

Input interpretation:

$$\frac{1}{5\log_{0.99914131}\left(\frac{1}{1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}}$$

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

ϕ is the golden ratio

Result:

0.00727896…

0.00727896…

This result is very near to the fine-structure constant

Alternative representation:

$$\frac{1}{5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}}=\frac{1}{18-\frac{1}{\phi}+\frac{5\log\left(\frac{1}{1+\frac{2\times 0.5^7}{0.5+0.5^2}-\frac{2\times 0.5^{20}}{1+0.5^5}}\right)}{\log(0.999141)}}$$

Series representations:

$$\frac{1}{5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}} = \frac{1}{18-\frac{1}{\phi}-\frac{5\sum_{k=1}^{\infty}\frac{(-1)^k(-0.0204064)^k}{k}}{\log(0.999141)}}$$

$$\frac{1}{5\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+18-\frac{1}{\phi}} =$$

$$-\left((0.2\,\phi)\Big/\left(0.2+\phi\,(-3.6+1164.06\log(0.979594))+\phi\log(0.979594)\sum_{k=0}^{\infty}(-0.00085869)^k\,G(k)\right)\right)$$

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

27*(((1/2*5log base 0.99914131[1/(((1+2*((0.5^((6+1))))/((1-0.5+0.5^2)) – 2 * ((0.5^(2*10))) / ((1+0.5^(3+2))))))]+4)))+1

Input interpretation:

$$27\left(\frac{1}{2}\times 5\log_{0.99914131}\left(\frac{1}{1+2\times\frac{0.5^{6+1}}{1-0.5+0.5^2}-2\times\frac{0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+4\right)+1$$

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

Result:

1729.00...

1729

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

Alternative representation:

$$27\left(\frac{5}{2}\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+4\right)+1=$$

$$1+27\left(4+\frac{5\log\left(\frac{1}{1+\frac{2\times 0.5^7}{0.5+0.5^2}-\frac{2\times 0.5^{20}}{1+0.5^5}}\right)}{2\log(0.999141)}\right)$$

Series representations:

$$27\left(\frac{5}{2}\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+4\right)+1=$$

$$109-\frac{135\sum_{k=1}^{\infty}\frac{(-1)^k(-0.0204064)^k}{k}}{2\log(0.999141)}$$

$$27\left(\frac{5}{2}\log_{0.999141}\left(\frac{1}{1+\frac{2\times 0.5^{6+1}}{1-0.5+0.5^2}-\frac{2\times 0.5^{2\times 10}}{1+0.5^{3+2}}}\right)+4\right)+1=$$

$$109.-78574.4\log(0.979594)-67.5\log(0.979594)\sum_{k=0}^{\infty}(-0.00085869)^k\,G(k)$$

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

Now, we have that:

For r = 2

$$J_{0,3}\psi(q)+\frac{1}{2}J_{1,2}^2=\sum_r\frac{q^{3r(r+1)/2}(1-q^{3r}+q^{6r})}{1+q^{9r}}$$

$$=\sum_r\frac{q^{3r(r+1)/2}}{1+q^{9r}}-\sum_r\frac{q^{3r(r+3)/2}}{1+q^{9r}}+\sum_r\frac{q^{3r(r+5)/2}}{1+q^{9r}}.$$

(0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)

Input:

$$\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}$$

Result:

0.001923076923076923076923076923076923076923076923076923076...

0.00192307692…

(((((0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)))))^1/512

Input:

$$\sqrt[512]{\frac{0.5^9}{1+0.5^{18}} - \frac{0.5^{15}}{1+0.5^{18}} + \frac{0.5^{21}}{1+0.5^{18}}}$$

Result:

0.98785978...

0.98785978… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

1/4log base 0.98785978(((((0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)))))-Pi+1/golden ratio

Input interpretation:

$$\frac{1}{4}\log_{0.98785978}\left(\frac{0.5^9}{1+0.5^{18}} - \frac{0.5^{15}}{1+0.5^{18}} + \frac{0.5^{21}}{1+0.5^{18}}\right) - \pi + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476...

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

Alternative representation:

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)-\pi+\frac{1}{\phi}=-\pi+\frac{1}{\phi}+\frac{\log\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)}{4\log(0.98786)}$$

Series representations:

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-0.998077)^k}{k}}{4\log(0.98786)}$$

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi-20.4677\log(0.00192308)-\frac{1}{4}\log(0.00192308)\sum_{k=0}^{\infty}(-0.0121402)^k G(k)$$

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

Note that:

1/4log base 0.98785978(((((0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)))))-Pi+1/x = 125.4763890892

Input interpretation:

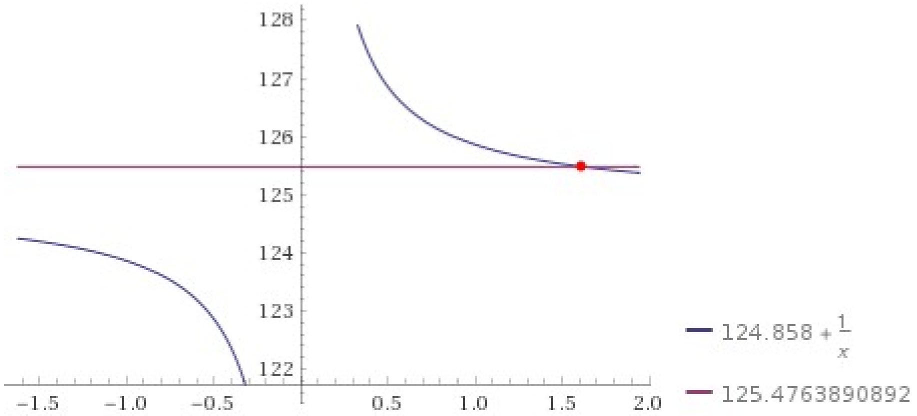
$$\frac{1}{4}\log_{0.98785978}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)-\pi+\frac{1}{x}=125.4763890892$$

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

Result:

$$124.858 + \frac{1}{x} = 125.4763890892$$

Plot:



Alternate form assuming x is real:

$$\frac{1.61803}{x} = 1$$

Alternate form:

$$\frac{124.858\,(x + 0.00800908)}{x} = 125.4763890892$$

Alternate form assuming x is positive:

$x = 1.61803$ (for $x \neq 0$)

Solution:

$x \approx 1.61803$

1.61803 result that is equal to the value of the golden ratio 1,618033988749...

Now:

1/4log base 0.98785978(((((0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)))))+11+1/golden ratio

Input interpretation:

$$\frac{1}{4} \log_{0.98785978}\left(\frac{0.5^9}{1 + 0.5^{18}} - \frac{0.5^{15}}{1 + 0.5^{18}} + \frac{0.5^{21}}{1 + 0.5^{18}}\right) + 11 + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618...

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

Alternative representation:

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\frac{\log\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)}{4\log(0.98786)}$$

Series representations:

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-0.998077)^k}{k}}{4\log(0.98786)}$$

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-20.4677\log(0.00192308)-\frac{1}{4}\log(0.00192308)\sum_{k=0}^{\infty}(-0.0121402)^k\,G(k)$$

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

This is the Ramanujan fundamental formula for obtain a beautiful and highly precise golden ratio:

$$\sqrt[5]{\left(\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5e^{\left(-\sqrt{5}\pi\right)^5}}-\frac{11\times 5e^{\left(-\sqrt{5}\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5e^{\left(-\sqrt{5}\pi\right)^5}\right)}-\frac{5\sqrt{5}\times 5e^{\left(-\sqrt{5}\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5e^{\left(-\sqrt{5}\pi\right)^5}\right)}\right)}$$

1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))

Input:

$$\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}$$

Exact result:

$$\frac{1}{\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}}$$

Decimal approximation:

11.090169943749474241022934171828190588601545899028814310677...

11.090169943749474241022934171828190588601545899028814310677

(11*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))

Input:

$$\frac{11\times5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}$$

Exact result:

$$\frac{55\,e^{-25\sqrt{5}\,\pi^5}}{2\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)}$$

Decimal approximation:

$9.9929022507071872307053630412945712274243697626525 5... \times 10^{-7428}$

9.99290225070718723070536304129457122742436976265255 × 10^-7428

(5sqrt(5)*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))

Input:

$$\frac{5\sqrt{5}\times5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}$$

Exact result:

$$\frac{25\sqrt{5}\, e^{-25\sqrt{5}\,\pi^5}}{2\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)}$$

Decimal approximation:

$1.0156731238678143887477757629564691789882352909878 4\ldots \times 10^{-7427}$

1.01567312386781438874777576295646917898823529098784 × 10^-7427

Input interpretation:

$$\left(1\Big/\left(\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)-\frac{9.992902250707187230705363041294571227424369762652 55}{10^{7428}}-\frac{1.01567312386781438874777576295646917898823529098784}{10^{7427}}\right)\right)\hat{}\,(1/5)$$

Result:

1.6180339887498948482045868343656381177203091798057 62862135...

Or:

((((1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))-(-
1.6382898797095665677239458827012056245798314722584 × 10^-7429)))^1/5

Input interpretation:

$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)--\frac{1.6382898797095665677239458827012056245798314722584}{10^{7429}}}}$$

Result:

1.6180339887498948482045868343656381177203091798057 62862135...

The result, thence, is:

1.6180339887498948482045868343656381177203091798057628

This is a wonderful golden ratio, fundamental constant of various fields of mathematics and physics

Translating the formula from the cosmological point of view, the two infinitesimal values with exponents -7427 and -7428 could represent the slightest ripples of the so-called supersymmetric vacuum which, therefore, like any vacuum, is not really "empty". The golden ratio represents then the very first symmetry break, even before the Big Bang, from which it emerged and was formalized the infinite-dimensional Hilbert space that is of a fractal nature, as is the golden ratio whose value is also a Hausdorff dimension. So ϕ represents the thought-information that becomes a creative act and from which the formal phase begins with the infinite representations of the absolute reality that corresponds to the two infinitesimal values mentioned above.

Now, we have that:

1/4log base 0.98785978(((((0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)))))+11-golden ratio

Input interpretation:

$$\frac{1}{4}\log_{0.98785978}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi$$

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

ϕ is the golden ratio

Result:

137.382...

137.382…

This result is very near to the inverse of fine-structure constant 137,035

Alternative representation:

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi = 11-\phi+\frac{\log\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)}{4\log(0.98786)}$$

Series representations:

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi=11-\phi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-0.998077)^k}{k}}{4\log(0.98786)}$$

$$\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi=$$
$$11-\phi-20.4677\log(0.00192308)-0.25\log(0.00192308)\sum_{k=0}^{\infty}(-0.0121402)^k G(k)$$
$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}G(-j+k)}{1+j}\right)$$

1/((((1/4log base 0.98785978(((((0.5^9) / (1+0.5^18) – (0.5^15) / (1+0.5^18) + (0.5^21) / (1+0.5^18)))))+11-golden ratio))))

Input interpretation:

$$\frac{1}{\frac{1}{4}\log_{0.98785978}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi}$$

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

ϕ is the golden ratio

Result:

0.00727898...

0.00727898…

This result is very near to the fine-structure constant

Alternative representation:

$$\frac{1}{\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi}=\frac{1}{11-\phi+\frac{\log\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)}{4\log(0.98786)}}$$

Series representations:

$$\frac{1}{\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi} = \frac{1}{11-\phi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-0.998077)^k}{k}}{4\log(0.98786)}}$$

$$\frac{1}{\frac{1}{4}\log_{0.98786}\left(\frac{0.5^9}{1+0.5^{18}}-\frac{0.5^{15}}{1+0.5^{18}}+\frac{0.5^{21}}{1+0.5^{18}}\right)+11-\phi} = -\left(1\Big/\left(-11+\phi+20.4677\log(0.00192308)+0.25\log(0.00192308)\sum_{k=0}^{\infty}(-0.0121402)^k G(k)\right)\right)$$

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

Now, we have that:

$$J_{1,6}\rho(q)=\sum_r \frac{(-1)^r q^{r(3r+4)}}{1-q^{6r+1}}$$

$$J_{1,6}\sigma(q)=\sum_r \frac{(-1)^r q^{(r+1)(3r+1)}}{1-q^{6r+3}}, \qquad (4.11 – 4.12)$$

For q = 0.5 and r = 2

(((-1)^2 0.5^(2(3*2+4)))) / ((1-0.5^(6*2+1)))

Input:

$$\frac{(-1)^2\times 0.5^{2(3\times2+4)}}{1-0.5^{6\times2+1}}$$

Result:

$9.537907459406665852765230130631180564033695519472591 8\ldots\times10^{-7}$

$9.537907459\ldots*10^{-7}$

(((-1)^2 0.5^((2+1)(3*2+1)))) / ((1-0.5^(6*2+3)))

Input:

$$\frac{(-1)^2 \times 0.5^{(2+1)(3\times 2+1)}}{1-0.5^{6\times 2+3}}$$

Result:

$4.768517105624561296426282540360728782006286812952055 4... \times 10^{-7}$

4.7685171056…*10^-7

We have:

((((((-1)^2 0.5^(2(3*2+4)))) / ((1-0.5^(6*2+1)))))) *1/ ((((((-1)^2 0.5^((2+1)(3*2+1)))) / ((1-0.5^(6*2+3))))))

Input:

$$\frac{(-1)^2 \times 0.5^{2(3\times 2+4)}}{1-0.5^{6\times 2+1}} \times \frac{1}{\frac{(-1)^2 \times 0.5^{(2+1)(3\times 2+1)}}{1-0.5^{6\times 2+3}}}$$

Result:

2.000183127823220607984373092418508118666829446953973873763...

2.00018312782... ≈ 2 result practically equal to the graviton spin

2.00018312782 > 2

With a difference of 0.00018312782

Or:

((((((-1)^2 0.5^((2+1)(3*2+1)))) / ((1-0.5^(6*2+3)))))) * 1 / ((((((-1)^2 0.5^(2(3*2+4)))) / ((1-0.5^(6*2+1))))))

Input:

$$\frac{(-1)^2 \times 0.5^{(2+1)(3\times 2+1)}}{1-0.5^{6\times 2+3}} \times \frac{1}{\frac{(-1)^2 \times 0.5^{2(3\times 2+4)}}{1-0.5^{6\times 2+1}}}$$

Result:

0.4999542222357860042115543076876125370036927396465956 60267...

0.4999542222 ≈ 0.5 = 1/2 result practically equal to the electron spin

0.4999542222 < 0.5

With a difference of -0.0000457778

We have also:

2*[((((((-1)^2 0.5^(2(3*2+4)))) / ((1-0.5^(6*2+1))))) *1/ ((((((-1)^2 0.5^((2+1)(3*2+1)))) / ((1-0.5^(6*2+3))))))]^6 - Pi + 1/golden ratio

Input:

$$2\left(\frac{(-1)^2\times 0.5^{2(3\times 2+4)}}{1-0.5^{6\times 2+1}}\times\frac{1}{\frac{(-1)^2\times 0.5^{(2+1)(3\times 2+1)}}{1-0.5^{6\times 2+3}}}\right)^6-\pi+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.547...

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

Alternative representations:

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6-\pi+\frac{1}{\phi}=-\pi+-\frac{1}{2\cos(216\,°)}+2\left(\frac{0.5^{20}}{\frac{\left(1-0.5^{13}\right)0.5^{21}}{1-0.5^{15}}}\right)^6$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6-\pi+\frac{1}{\phi}=$$
$$-180\,°+-\frac{1}{2\cos(216\,°)}+2\left(\frac{0.5^{20}}{\frac{\left(1-0.5^{13}\right)0.5^{21}}{1-0.5^{15}}}\right)^6$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6-\pi+\frac{1}{\phi}=-\pi+\frac{1}{2\cos\left(\frac{\pi}{5}\right)}+2\left(\frac{0.5^{20}}{\frac{\left(1-0.5^{13}\right)0.5^{21}}{1-0.5^{15}}}\right)^6$$

Series representations:

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6 - \pi + \frac{1}{\phi} = 128.07 + \frac{1}{\phi} - 4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6 - \pi + \frac{1}{\phi} = 130.07 + \frac{1}{\phi} - 2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6 - \pi + \frac{1}{\phi} = 128.07 + \frac{1}{\phi} - \sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6 - \pi + \frac{1}{\phi} = 128.07 + \frac{1}{\phi} - 2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6 - \pi + \frac{1}{\phi} = 128.07 + \frac{1}{\phi} - 4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6 - \pi + \frac{1}{\phi} = 128.07 + \frac{1}{\phi} - 2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

2*[((((((-1)^2 0.5^(2(3*2+4)))) / ((1-0.5^(6*2+1)))))) *1/ ((((((-1)^2 0.5^((2+1)(3*2+1)))) / ((1-0.5^(6*2+3))))))]^6 +11 + 1/golden ratio

Input:

$$2\left(\frac{(-1)^2\times 0.5^{2(3\times 2+4)}}{1-0.5^{6\times 2+1}}\times\frac{1}{\frac{(-1)^2\times 0.5^{(2+1)(3\times 2+1)}}{1-0.5^{6\times 2+3}}}\right)^6 + 11 + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.688...

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

Alternative representations:

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6+11+\frac{1}{\phi}=11+2\left(\frac{0.5^{20}}{\frac{\left(1-0.5^{13}\right)0.5^{21}}{1-0.5^{15}}}\right)^6+\frac{1}{2\sin(54\,°)}$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6+11+\frac{1}{\phi}=11+-\frac{1}{2\cos(216\,°)}+2\left(\frac{0.5^{20}}{\frac{\left(1-0.5^{13}\right)0.5^{21}}{1-0.5^{15}}}\right)^6$$

$$2\left(\frac{(-1)^2\, 0.5^{2(3\times 2+4)}}{\frac{\left((-1)^2\, 0.5^{(2+1)(3\times 2+1)}\right)\left(1-0.5^{6\times 2+1}\right)}{1-0.5^{6\times 2+3}}}\right)^6+11+\frac{1}{\phi}=11+2\left(\frac{0.5^{20}}{\frac{\left(1-0.5^{13}\right)0.5^{21}}{1-0.5^{15}}}\right)^6+-\frac{1}{2\sin(666\,°)}$$

Now, we have:

27*[((((((-1)^2 0.5^(2(3*2+4)))) / ((1-0.5^(6*2+1)))))) *1/ ((((((-1)^2 0.5^((2+1)(3*2+1)))) / ((1-0.5^(6*2+3))))))]^6

Input:

$$27\left(\frac{(-1)^2\times 0.5^{2(3\times 2+4)}}{1-0.5^{6\times 2+1}}\times\frac{1}{\frac{(-1)^2\times 0.5^{(2+1)(3\times 2+1)}}{1-0.5^{6\times 2+3}}}\right)^6$$

Result:

1728.949551974089685015092705806320160672476410429782789246...

1728.9495519...

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 (taxicab number)

We have that:

$$J_1\phi(q) = 2\sum_r \frac{q^r}{1+q^{3r}} - 2\sum_r \frac{(-1)^r q^{(r+1)(3r+2)/2}}{1-q^{3r+2}}. \qquad (3.29)$$

$$\sum_r \frac{(-1)^r q^{(r+1)(3r+2)/2}}{1-q^{3r+2}} = -\sum_r \frac{q^{(2r+3)(3r+2)}}{1-q^{6r+4}} + \sum_r \frac{q^{(r+1)(6r+1)}}{1-q^{6r+1}}. \qquad (3.33)$$

$$J_{0,3}\psi(q) + \frac{1}{2} J_{1,2}^2 = \sum_r \frac{q^{3r(r+1)/2}(1-q^{3r}+q^{6r})}{1+q^{9r}}$$

$$= \sum_r \frac{q^{3r(r+1)/2}}{1+q^{9r}} - \sum_r \frac{q^{3r(r+3)/2}}{1+q^{9r}} + \sum_r \frac{q^{3r(r+5)/2}}{1+q^{9r}}. \qquad (3.34)$$

so (3.34) equals

$$2\sum_r \frac{q^{3r(r+1)/2}}{1+q^{9r}} - \sum_r \frac{q^{3r(r+3)/2}}{1+q^{9r}}. \qquad (3.35)$$

For r = 2, we obtain from (3.29):

2*((0.5^2))/((1+0.5^6)) – 2*((((-1)^2 0.5^((2+1)(3*2+2)/2)))/(((1-0.5^(3*2+2)))

Input:

$$2 \times \frac{0.5^2}{1+0.5^6} - 2 \times \frac{(-1)^2 \times 0.5^{(2+1)(1/2(3\times 2+2))}}{1-0.5^{3\times 2+2}}$$

Result:

0.491817496229260935143288084464555052790346907993966817496...

0.491817496…

Repeating decimal:

$0.491\overline{817496229260935143288084464555052790346907993966}$

(period 48)

For (3.33), we obtain:

-((0.5^(((2*2+3)(3*2+2)))))/((1-0.5^(6*2+4))+((0.5^(((2+1)(6*2+1)))))/(((1-0.5^(6*2+1))))

Input:

$$-\frac{0.5^{(2\times 2+3)(3\times 2+2)}}{1-0.5^{6\times 2+4}}+\frac{0.5^{(2+1)(6\times 2+1)}}{1-0.5^{6\times 2+1}}$$

Result:

$1.8191975972595756631781763868881671994982611542569844... \times 10^{-12}$

$1.8191975972…*10^{-12}$

For (3.35)

so (3.34) equals

$$2\sum_r \frac{q^{3r(r+1)/2}}{1+q^{9r}} - \sum_r \frac{q^{3r(r+3)/2}}{1+q^{9r}}. \quad (3.35)$$

We obtain:

2* 0.5^((6(2+1)/2)) / (1+0.5^18) – 0.5^((6(2+3)/2)) / (1+0.5^18)

Input:

$$2\times\frac{0.5^{6\times(2+1)/2}}{1+0.5^{18}}-\frac{0.5^{6\times(2+3)/2}}{1+0.5^{18}}$$

Result:

0.0038757176371855270937839745179194720479124148848919491112...

0.00387571763718...

Thence, we have:

(0.49181749622926093514328 * 1 / 1.8191975972595756631781763868 × 10^-12 * 1 / 0.003875717637185527093783974)

Input interpretation:

$$0.49181749622926093514328\times\frac{1}{1.819197597259575663178176386\times 10^{-12}}\times\frac{1}{0.003875717637185527093783974}$$

Result:

6.97544584755750988490886164720800576263639842388385 14... × 10^{13}

6.9754458475…*10^{13}

(((0.4918174962292609351 4328 * 1 / 1.8191975972595756631781 76386 × 10^-12 * 1 / 0.00387571763718552709378 3974)))^1/4 -123

Input interpretation:

$$\left(0.49181749622926093514328\times\frac{1}{1.819197597259575663178176386\times10^{-12}}\times\frac{1}{0.003875717637185527093783974}\right)^{\wedge}(1/4)-123$$

Result:

2766.967726797386135609 70...

2766.96772679… result very near to the rest mass of charmed Omega baryon 2765.9

3(((0.491817496229 * 1 / 1.819197597259 × 10^-12 * 1 / 0.003875717637)))^1/5-29-golden ratio^3+1

Input interpretation:

$$3\sqrt[5]{0.491817496229\times\frac{1}{1.819197597259\times10^{-12}}\times\frac{1}{0.003875717637}}-29-\phi^3+1$$

ϕ is the golden ratio

Result:

1729.0733163...

1729.0733163...

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 (taxicab number)

Now, we have that:

Turning to λ and μ, we have, by Eqs. (2.23) and (2.24),

$$2\bar{J}_{1,4}\lambda(q) = \sum_{\substack{sg(r)=sg(s)\\ r\equiv s \pmod 2}} sg(r)(-1)^r q^{rs+\binom{(r+s+4)/2}{2}-1} \tag{4.13}$$

and

$$2\bar{J}_{1,4}\mu(q) = \sum_{\substack{sg(r)=sg(s)\\ r\equiv s \pmod 2}} sg(r)(-1)^r q^{rs+\binom{(r+s+2)/2}{2}}. \tag{4.14}$$

$$\bar{J}_{1,4}\lambda(q) = \sum_{n\geq 0} (-1)^n q^{3n(n+1)/2} \sum_{j=-n}^{n} (-1)^j q^{-j^2} \tag{2.23}$$

$$2\bar{J}_{1,4}\mu(q) = \sum_{n} (-1)^n q^{n(3n+1)/2} \sum_{j=-n}^{n} (-1)^j q^{-j^2} \tag{2.24}$$

For j = 3 and n = 5, we obtain from (2.23):

(-1)^5 * (0.5^((15(5+1)/2))) * (-1)^3 0.5^((-3)^2)

Input:

$(-1)^5 \times 0.5^{15\times(5+1)/2} (-1)^3 \times 0.5^{(-3)^2}$

Result:

$5.5511151231257827021181583404541015625 \times 10^{-17}$

$5.5511151231\ldots*10^{-17}$

and from (2.24)

(-1)^5 *(0.5^((5(15+1)/2))) * (-1)^3 0.5^((-3)^2)

Input:

$(-1)^5 \times 0.5^{5\times(15+1)/2}\,(-1)^3 \times 0.5^{(-3)^2}$

Result:

$1.7763568394002504646778106689453125 \times 10^{-15}$

1.7763568394…*10^{-15}

From the ratio between the two results, we obtain:

(5.5511151231257827021181583404541015625 × 10^-17 / 1.7763568394002504646778106689453125 × 10^-15)

Input interpretation:

$$\frac{5.5511151231257827021181583404541015625 \times 10^{-17}}{1.7763568394002504646778106689453125 \times 10^{-15}}$$

Result:

0.03125

0.03125 = 1/32

From which:

((4*1/(5.5511151231257827021181583404541015625 × 10^-17 *1 / 1.7763568394002504646778106689453125 × 10^-15)))-Pi+1/golden ratio

Input interpretation:

$$4 \times 1 \Big/ \left(5.5511151231257827021181583404541015625 \times 10^{-17} \times \frac{1}{1.7763568394002504646778106689453125 \times 10^{-15}}\right) - \pi + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.4764413351601016097419434510861 4…

125.47644133516… 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 and:

((4*1/(5.5511151231257827021181583404541015625 × 10^-17 *1 / 1.7763568394002504646778106689453125 × 10^-15)))+11+1/golden ratio

Input interpretation:

$$4\times 1\Big/\left(5.5511151231257827021181583404541015625\times 10^{-17}\times \frac{1}{1.7763568394002504646778106689453125\times 10^{-15}}\right)+11+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.61803398874989484820458683436564...

139.6180339887… result practically equal to the rest mass of Pion meson 139.57 MeV

Now, we have that:

$$2\sum_r \frac{q^{9r(3r+1)/2}}{1+q^{27r}}+2q^3\sum_r \frac{q^{27r(r+1)/2}}{1+q^{27r+9}}+2\sum_r \frac{q^{9(r+1)(3r+2)/2}}{1+q^{27r+18}}$$
$$-\sum_r \frac{q^{27r(r+1)/2}}{1+q^{27r}}-q^{-3}\sum_r \frac{q^{9(r+1)(3r+2)/2}}{1+q^{27r+9}}$$
$$-q^{-3}\sum_r \frac{q^{9(r+1)(3r+4)/2}}{1+q^{27r+18}}.$$

For r = 2, we obtain:

2* (0.5^(18(6+1)/2))/(1+0.5^54) + 2*0.5^3* (0.5^(54(2+1)/2)) / (1+0.5^63) + 2 * (0.5^(27(6+2)/2)) / (1+0.5^72)

Input:

$$2\times \frac{0.5^{18\times(6+1)/2}}{1+0.5^{54}}+2\times 0.5^3\times \frac{0.5^{54\times(2+1)/2}}{1+0.5^{63}}+2\times \frac{0.5^{27\times(6+2)/2}}{1+0.5^{72}}$$

Result:

2.1684053789468360686870979462419350084764713961290298... × 10^-19

$2.1684053789...*10^{-19}$

- (0.5^(54(2+1)/2)) / (1+0.5^54) – 0.5^(-3) *(0.5^(27(6+2)/2)) / (1+0.5^63) – 0.5^(-3) * (0.5^(27(6+4)/2)) / (1+0.5^72)

Input:

$$-\frac{0.5^{54\times(2+1)/2}}{1+0.5^{54}}-\frac{\frac{0.5^{27\times(6+2)/2}}{1+0.5^{63}}}{0.5^{3}}-\frac{\frac{0.5^{27\times(6+4)/2}}{1+0.5^{72}}}{0.5^{3}}$$

Result:

$-4.135903309284172863044415389633558863131135957164058... \times 10^{-25}$

$-4.1359033092…*10^{-25}$

In conclusion, we obtain:

((((2* (0.5^(18(6+1)/2))/(1+0.5^54) + 2*0.5^3* (0.5^(54(2+1)/2)) / (1+0.5^63) + 2 * (0.5^(27(6+2)/2)) / (1+0.5^72))))) - (-4.1359033092841 × 10^-25)

Input interpretation:

$$\left(2\times\frac{0.5^{18\times(6+1)/2}}{1+0.5^{54}}+2\times0.5^{3}\times\frac{0.5^{54\times(2+1)/2}}{1+0.5^{63}}+2\times\frac{0.5^{27\times(6+2)/2}}{1+0.5^{72}}\right)- -4.1359033092841\times10^{-25}$$

Result:

$2.168409514850145352787097946241935008476471396129029 8... \times 10^{-19}$

$2.16840951485...*10^{-19}$

From which:

[((((2* (0.5^(18(6+1)/2))/(1+0.5^54) + 2*0.5^3* (0.5^(54(2+1)/2)) / (1+0.5^63) + 2 * (0.5^(27(6+2)/2)) / (1+0.5^72))))) - (-4.1359033092841 × 10^-25)]^1/4096

Input interpretation:

$$\left(\left(2\times\frac{0.5^{18\times(6+1)/2}}{1+0.5^{54}}+2\times0.5^{3}\times\frac{0.5^{54\times(2+1)/2}}{1+0.5^{63}}+2\times\frac{0.5^{27\times(6+2)/2}}{1+0.5^{72}}\right)- -4.1359033092841\times10^{-25}\right)\wedge(1/4096)$$

Result:

0.98956288...

0.98956288... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

and:

2sqrt(((log base 0.98956288[((((2* (0.5^(18(6+1)/2))/(1+0.5^54) + 2*0.5^3* (0.5^(54(2+1)/2)) / (1+0.5^63) + 2 * (0.5^(27(6+2)/2)) / (1+0.5^72))))) - (-4.1359033092841 × 10^-25)])))-Pi+1/golden ratio

Input interpretation:

$$2\sqrt{\log_{0.98956288}\left(\left(2\times\frac{0.5^{18\times(6+1)/2}}{1+0.5^{54}}+2\times0.5^3\times\frac{0.5^{54\times(2+1)/2}}{1+0.5^{63}}+2\times\frac{0.5^{27\times(6+2)/2}}{1+0.5^{72}}\right)-\\ -4.1359033092841\times10^{-25}\right)}-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476...

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

2sqrt(((log base 0.98956288[((((2* (0.5^(18(6+1)/2))/(1+0.5^54) + 2*0.5^3* (0.5^(54(2+1)/2)) / (1+0.5^63) + 2 * (0.5^(27(6+2)/2)) / (1+0.5^72))))) - (-4.1359033092841 × 10^-25)])))+11+1/golden ratio

Input interpretation:

$$2\sqrt{\log_{0.98956288}\left(\left(2\times\frac{0.5^{18\times(6+1)/2}}{1+0.5^{54}}+2\times0.5^3\times\frac{0.5^{54\times(2+1)/2}}{1+0.5^{63}}+2\times\frac{0.5^{27\times(6+2)/2}}{1+0.5^{72}}\right)--4.1359033092841\times10^{-25}\right)}+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618...

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

27*sqrt(((log base 0.98956288[((((2* (0.5^(18(6+1)/2))/(1+0.5^54) + 2*0.5^3* (0.5^(54(2+1)/2)) / (1+0.5^63) + 2 * (0.5^(27(6+2)/2)) / (1+0.5^72))))) - (-4.1359033092841 × 10^-25)])))+1

Input interpretation:

$$27\sqrt{\log_{0.98956288}\left(\left(2\times\frac{0.5^{18\times(6+1)/2}}{1+0.5^{54}}+2\times0.5^3\times\frac{0.5^{54\times(2+1)/2}}{1+0.5^{63}}+2\times\frac{0.5^{27\times(6+2)/2}}{1+0.5^{72}}\right)--4.1359033092841\times10^{-25}\right)}+1$$

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

Result:

1729.00...

1729

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

Now, we have that:

$$1+2\sum_{n\geq 1}\frac{q^{n(6n+1)}}{1-q^n+q^{2n}}=2\sum_{n}\frac{q^{n(6n+1)}}{1+q^{3n}}, \qquad (6.5)$$

For n = 2, we obtain:

1+2* (((0.5^(2(12+1)))))/((1-0.5^2+0.5^4))

Input:

$$1+2\times\frac{0.5^{2(12+1)}}{1-0.5^2+0.5^4}$$

Result:

1.000000036679781400240384615384615384615384615384615...

1.0000000366797814…

Repeating decimal:

$1.000000036679781400240\overline{384615}$ (period 6)

2 * (((0.5^(2(12+1)))))/((1+0.5^6))

Input:

$$2\times\frac{0.5^{2(12+1)}}{1+0.5^6}$$

Result:

$2.934382512019230769230769230769230769230769230769230769230 7... \times 10^{-8}$

$2.934382512019\ldots*10^{-8}$

Repeating decimal:

$0.0000000293438251201\overline{923076}$ (period 6)

Rational approximation:

$$\frac{1}{34078720}$$

(((1+2* (((0.5^(2(12+1)))))/((1-0.5^2+0.5^4)))))x = (((2 * (((0.5^(2(12+1)))))/((1+0.5^6)))))

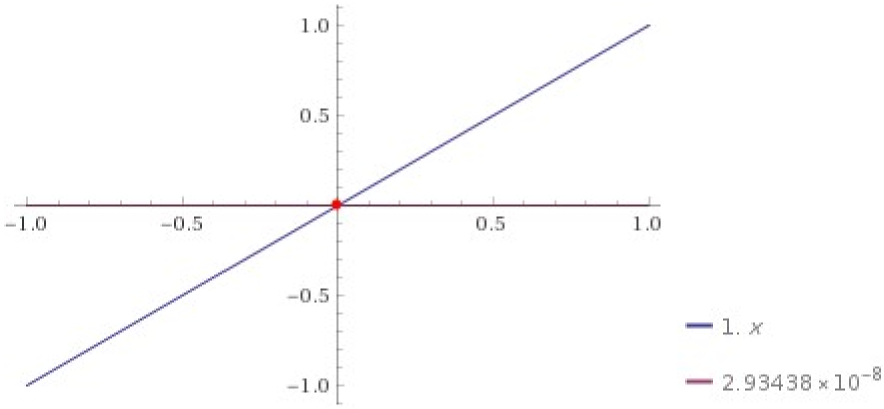
Input:

$$\left(1 + 2 \times \frac{0.5^{2(12+1)}}{1 - 0.5^2 + 0.5^4}\right) x = 2 \times \frac{0.5^{2(12+1)}}{1 + 0.5^6}$$

Result:

$1.\,x = 2.93438 \times 10^{-8}$

Plot:



Alternate form:

$1.\,x - 2.93438 \times 10^{-8} = 0$

Alternate form assuming x is real:

$1.\,x + 0 = 2.93438 \times 10^{-8}$

Solution:

$x \approx 2.93438 \times 10^{-8}$

$2.93438*10^{-8}$

We have also:

(((2 * (((0.5^(2(12+1)))))/((1+0.5^6)))))^1/2048

Input:

$$\sqrt[2048]{2\times\frac{0.5^{2(12+1)}}{1+0.5^6}}$$

Result:

0.99156692...

0.99156692... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

1/16 log base 0.99156692(((2 * (((0.5^(2(12+1)))))/((1+0.5^6))))) - Pi +1/golden ratio

Input interpretation:

$$\frac{1}{16}\log_{0.99156692}\left(2\times\frac{0.5^{2(12+1)}}{1+0.5^6}\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476...

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

Alternative representation:

$$\frac{1}{16}\log_{0.991567}\left(\frac{2\times 0.5^{2\,(12+1)}}{1+0.5^6}\right)-\pi+\frac{1}{\phi} = -\pi+\frac{1}{\phi}+\frac{\log\left(\frac{2\times 0.5^{26}}{1+0.5^6}\right)}{16\log(0.991567)}$$

Series representations:

$$\frac{1}{16}\log_{0.991567}\left(\frac{2\times 0.5^{2\,(12+1)}}{1+0.5^6}\right)-\pi+\frac{1}{\phi} = \frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-1.)^k}{k}}{16\log(0.991567)}$$

$$\frac{1}{16}\log_{0.991567}\left(\frac{2\times 0.5^{2\,(12+1)}}{1+0.5^6}\right)-\pi+\frac{1}{\phi} = \frac{1}{\phi}-\pi-7.38004\log(2.93438\times 10^{-8})-\frac{1}{16}\log(2.93438\times 10^{-8})\sum_{k=0}^{\infty}(-0.00843308)^k\,G(k)$$

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

1/16 log base 0.99156692(((2 * (((0.5^(2(12+1)))))/((1+0.5^6))))) +11 +1/golden ratio

Input interpretation:

$$\frac{1}{16}\log_{0.99156692}\left(2\times\frac{0.5^{2\,(12+1)}}{1+0.5^6}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618...

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

Alternative representation:

$$\frac{1}{16}\log_{0.991567}\left(\frac{2\times 0.5^{2\,(12+1)}}{1+0.5^6}\right)+11+\frac{1}{\phi} = 11+\frac{1}{\phi}+\frac{\log\left(\frac{2\times 0.5^{26}}{1+0.5^6}\right)}{16\log(0.991567)}$$

Series representations:

$$\frac{1}{16}\log_{0.991567}\left(\frac{2\times 0.5^{2(12+1)}}{1+0.5^6}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-1.)^k}{k}}{16\log(0.991567)}$$

$$\frac{1}{16}\log_{0.991567}\left(\frac{2\times 0.5^{2(12+1)}}{1+0.5^6}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-7.38004\log(2.93438\times 10^{-8})-\frac{1}{16}\log(2.93438\times 10^{-8})\sum_{k=0}^{\infty}(-0.00843308)^k G(k)$$

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

27 * 1/32 log base 0.99156692(((2 * (((0.5^(2(12+1)))))/((1+0.5^6))))) + 1

Input interpretation:

$$27\times\frac{1}{32}\log_{0.99156692}\left(2\times\frac{0.5^{2(12+1)}}{1+0.5^6}\right)+1$$

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

Result:

1729.00...

1729

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

Alternative representation:

$$\frac{27}{32}\log_{0.991567}\left(\frac{2\times 0.5^{2(12+1)}}{1+0.5^6}\right)+1=1+\frac{27\log\left(\frac{2\times 0.5^{26}}{1+0.5^6}\right)}{32\log(0.991567)}$$

Series representations:

$$\frac{27}{32}\log_{0.991567}\left(\frac{2\times 0.5^{2(12+1)}}{1+0.5^6}\right)+1=1-\frac{27\sum_{k=1}^{\infty}\frac{(-1)^k(-1.)^k}{k}}{32\log(0.991567)}$$

$$\frac{27}{32}\log_{0.991567}\left(\frac{2\times 0.5^{2(12+1)}}{1+0.5^6}\right)+1=1-99.6305\log(2.93438\times 10^{-8})-$$
$$0.84375\log(2.93438\times 10^{-8})\sum_{k=0}^{\infty}(-0.00843308)^k\,G(k)$$
$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

Now, we have that:

$$J_1\psi(q)=\sum_n \frac{q^{6n^2+4n+1}(1-q^{3n+1})}{1+q^{3n+1}}, \qquad (6.35)$$

For n = 2, we obtain:

((((0.5^(24+8+1))*(1-0.5^7)))/(((1+0.5^7)))

Input:

$$\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}$$

Result:

$1.1461043311643970105075096899224806201550387596899224\ldots\times 10^{-10}$

$1.1461043311643...*10^{-10}$

((((((0.5^(24+8+1))*(1-0.5^7)))/(((1+0.5^7))))))^1/4096

Input:

$$\sqrt[4096]{\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}}$$

Result:

0.99442733...

0.99442733... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

2 sqrt(((log base 0.99442733((((((0.5^(24+8+1))*(1-0.5^7)))/(((1+0.5^7))))))))))-Pi+1/golden ratio

Input interpretation:

$$2\sqrt{\log_{0.99442733}\left(\frac{0.5^{24+8+1}\,(1-0.5^7)}{1+0.5^7}\right)}-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476...

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

Alternative representation:

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}\,(1-0.5^7)}{1+0.5^7}\right)}-\pi+\frac{1}{\phi}=-\pi+\frac{1}{\phi}+2\sqrt{\frac{\log\left(\frac{(1-0.5^7)\,0.5^{33}}{1+0.5^7}\right)}{\log(0.994427)}}$$

Series representations:

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi+2\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-1.)^k}{k}}{\log(0.994427)}}$$

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi+ 2\sqrt{-1+\log_{0.994427}(1.1461\times10^{-10})}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}(-1+\log_{0.994427}(1.1461\times10^{-10}))^{-k}$$

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}-\pi+\frac{1}{\phi}= \frac{1}{\phi}-\pi+2\sqrt{-1+\log_{0.994427}(1.1461\times10^{-10})} \sum_{k=0}^{\infty}\frac{(-1)^k(-1+\log_{0.994427}(1.1461\times10^{-10}))^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

2 sqrt(((log base 0.99442733((((((0.5^(24+8+1))*(1-0.5^7)))/(((1+0.5^7)))))))))+11+1/golden ratio

Input interpretation:

$$2\sqrt{\log_{0.99442733}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618...

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

Alternative representation:

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}+11+\frac{1}{\phi}=11+\frac{1}{\phi}+2\sqrt{\frac{\log\left(\frac{(1-0.5^7)0.5^{33}}{1+0.5^7}\right)}{\log(0.994427)}}$$

Series representations:

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}+11+\frac{1}{\phi}=11+\frac{1}{\phi}+2\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k(-1.)^k}{k}}{\log(0.994427)}}$$

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}+11+\frac{1}{\phi}=11+\frac{1}{\phi}+2\sqrt{-1+\log_{0.994427}(1.1461\times10^{-10})}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\log_{0.994427}(1.1461\times10^{-10})\right)^{-k}$$

$$2\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}+11+\frac{1}{\phi}=11+\frac{1}{\phi}+2\sqrt{-1+\log_{0.994427}(1.1461\times10^{-10})}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+\log_{0.994427}(1.1461\times10^{-10})\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

27 sqrt(((log base 0.99442733((((((0.5^(24+8+1))*(1-0.5^7)))/(((1+0.5^7)))))))))+1

Input interpretation:

$$27\sqrt{\log_{0.99442733}\left(\frac{0.5^{24+8+1}(1-0.5^7)}{1+0.5^7}\right)}+1$$

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

Result:

1729.00...

1729

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

Alternative representation:

$$27\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}\,(1-0.5^7)}{1+0.5^7}\right)}+1 = 1+27\sqrt{\frac{\log\left(\frac{(1-0.5^7)\,0.5^{33}}{1+0.5^7}\right)}{\log(0.994427)}}$$

Series representations:

$$27\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}\,(1-0.5^7)}{1+0.5^7}\right)}+1 = 1+27\sqrt{-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\,(-1.)^k}{k}}{\log(0.994427)}}$$

$$27\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}\,(1-0.5^7)}{1+0.5^7}\right)}+1 =$$
$$1+27\sqrt{-1+\log_{0.994427}(1.1461\times10^{-10})}\,\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\log_{0.994427}(1.1461\times10^{-10})\right)^{-k}$$

$$27\sqrt{\log_{0.994427}\left(\frac{0.5^{24+8+1}\,(1-0.5^7)}{1+0.5^7}\right)}+1 = 1+27\sqrt{-1+\log_{0.994427}(1.1461\times10^{-10})}$$
$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+\log_{0.994427}(1.1461\times10^{-10})\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

Appendix

DILATON VALUE CALCULATIONS 0.989117352243

from:

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

We have that:

5. Since G_n and g_n can be expressed as roots of algebraical equations with rational coefficients, the same is true of G_n^{24} or g_n^{24}. So let us suppose that

$$1 = ag_n^{-24} - bg_n^{-48} + \cdots,$$

or

$$g_n^{24} = a - bg_n^{-24} + \cdots.$$

But we know that

$$\begin{aligned} 64e^{-\pi\sqrt{n}} g_n^{24} &= 1 - 24e^{-\pi\sqrt{n}} + 276e^{-2\pi\sqrt{n}} - \cdots, \\ 64g_n^{24} &= e^{\pi\sqrt{n}} - 24 + 276e^{-\pi\sqrt{n}} - \cdots, \\ 64a - 64bg_n^{-24} + \cdots &= e^{\pi\sqrt{n}} - 24 + 276e^{-\pi\sqrt{n}} - \cdots, \\ 64a - 4096be^{-\pi\sqrt{n}} + \cdots &= e^{\pi\sqrt{n}} - 24 + 276e^{-\pi\sqrt{n}} - \cdots, \end{aligned}$$

that is

$$e^{\pi\sqrt{n}} = (64a + 24) - (4096b + 276)e^{-\pi\sqrt{n}} + \cdots \tag{13}$$

Similarly, if

$$1 = aG_n^{-24} - bG_n^{-48} + \cdots,$$

then

$$e^{\pi\sqrt{n}} = (64a - 24) - (4096b + 276)e^{-\pi\sqrt{n}} + \cdots \tag{14}$$

From (13) and (14) we can find whether $e^{\pi\sqrt{n}}$ is very nearly an integer for given values of n, and ascertain also the number of 9's or 0's in the decimal part. But if G_n and g_n be simple quadratic surds we may work independently as follows. We have, for example,

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

Hence

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

so that

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

Hence

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

Again

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

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

so that

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

Hence

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

Similarly, from

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

we obtain

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

Hence

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

From:

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

Now, we have that:

From the following vacuum equations:

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

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

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

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

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

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

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

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

Therefore with respect to the exponential of the vacuum equation, the Ramanujan's exponential has a coefficient of 4096 which is equal to 64^2, while -6C+ϕ is equal to -$\pi\sqrt{18}$. From this it follows that it is possible to establish mathematically, the dilaton value.

phi = -Pi*sqrt(18) + 6C, for C = 1, we obtain:

exp((-Pi*sqrt(18))

Input:

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

Exact result:

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

Decimal approximation:

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

1.6272016… * 10^{-6}

Now:

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

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

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

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

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

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

Input interpretation:

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

Result:

0.0066650177536

0.006665017...

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

Dividing both sides by 0.000244140625, we obtain:

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

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

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

Input interpretation:

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

Result:

0.00666501785...

0.00666501785…

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

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

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

= 0.00666501785…

ln(0.00666501784619)

Input interpretation:

log(0.00666501784619)

Result:

-5.010882647757...

-5.010882647757…

Now:

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

For C = 1, we obtain:

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

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.

References

Ramanujan's "Lost" Notebook VII: The Sixth Order Mock Theta Functions
GEORGE E. ANDREWS AND DEAN HICKERSON - ADVANCES IN MATHEMATICS 89, 60-105 (1991)