On some Ramanujan equations: mathematical connections with ϕ and various expressions concerning Teleparallel Equivalent of General Relativity and Modified Gravity Theory. III

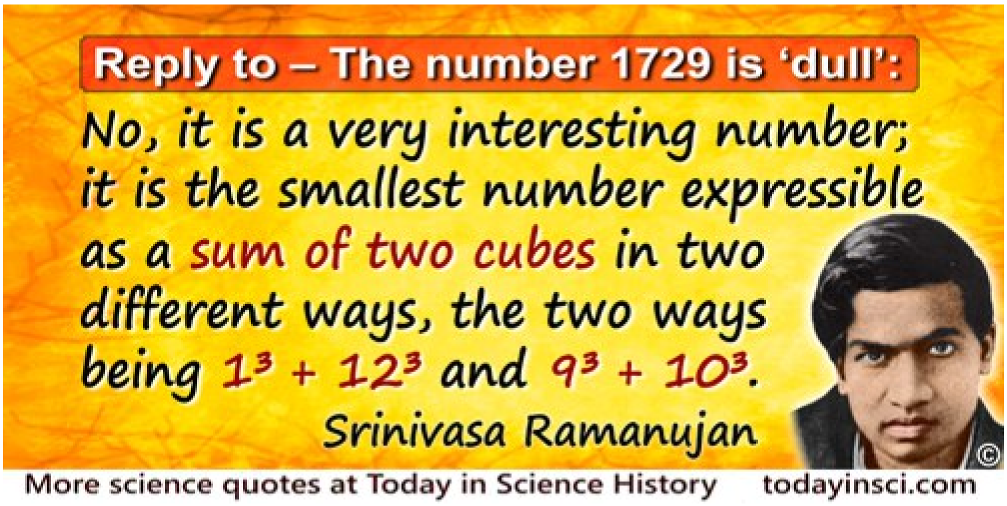
Michele Nardelli[1], **Antonio Nardelli**[2]

Abstract

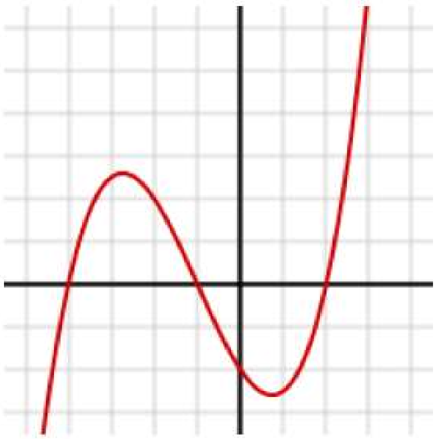
In this paper we have described some Ramanujan formulas and obtained some mathematical connections with ϕ and various equations concerning Teleparallel Equivalent of General Relativity and Modified Gravity Theory

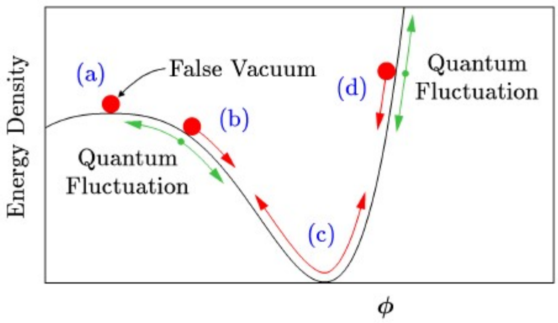
[1] M.Nardelli studied at Dipartimento di Scienze della Terra Università degli Studi di Napoli Federico II, Largo S. Marcellino, 10 - 80138 Napoli, Dipartimento di Matematica ed Applicazioni "R. Caccioppoli" - Università degli Studi di Napoli "Federico II" – Polo delle Scienze e delle Tecnologie Monte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

[2] A. Nardelli studies at the Università degli Studi di Napoli Federico II - Dipartimento di Studi Umanistici – **Sezione Filosofia - scholar of Theoretical Philosophy**



https://todayinsci.com/R/Ramanujan_Srinivasa/RamanujanSrinivasa-Quotations.htm





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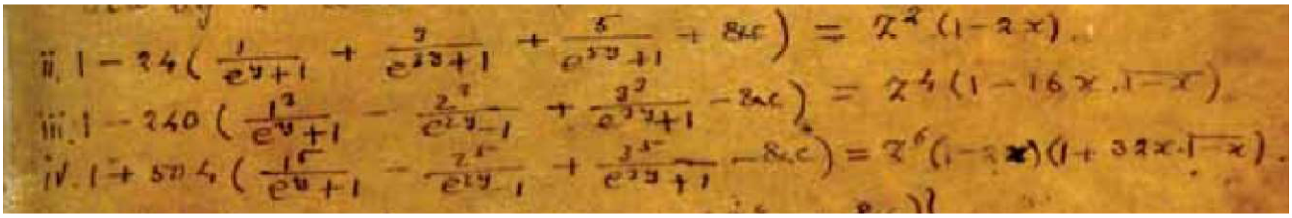

ii. $1-24\left(\frac{1}{e^{y}+1}+\frac{3}{e^{3y}+1}+\frac{5}{e^{5y}+1}+\&c\right)=z^2(1-2x)$.

iii. $1-240\left(\frac{1^3}{e^{y}+1}-\frac{2^3}{e^{2y}-1}+\frac{3^3}{e^{3y}+1}-\&c\right)=z^4(1-16x\sqrt{1-x})$.

iv. $1+504\left(\frac{1^5}{e^{y}+1}-\frac{2^5}{e^{2y}-1}+\frac{3^5}{e^{3y}+1}-\&c\right)=z^6(1-2x)(1+32x\sqrt{1-x})$.

For y =2

(((1-24((((1/(e^2+1))+3/(e^6+1)+5/(e^10+1))))))

Input:

$$1-24\left(\frac{1}{e^2+1}+\frac{3}{e^6+1}+\frac{5}{e^{10}+1}\right)$$

Decimal approximation:

-2.044346740052817221959387087476510546136721104261719910 99...

-2.04434674…

Property:

$$1-24\left(\frac{1}{1+e^2}+\frac{3}{1+e^6}+\frac{5}{1+e^{10}}\right)$$ is a transcendental number

Alternate forms:

$$1-\frac{24}{1+e^2}-\frac{72}{1+e^6}-\frac{120}{1+e^{10}}$$

$$1-\frac{72}{1+e^2}+\frac{24(e^2-2)}{1-e^2+e^4}+\frac{24(-4+3e^2-2e^4+e^6)}{1-e^2+e^4-e^6+e^8}$$

$$1-\frac{24(9-10e^2+11e^4-6e^6+6e^8-2e^{10}+e^{12})}{(1+e^2)(1-e^2+e^4)(1-e^2+e^4-e^6+e^8)}$$

Alternative representation:

$$1-24\left(\frac{1}{e^2+1}+\frac{3}{e^6+1}+\frac{5}{e^{10}+1}\right)=1-24\left(\frac{1}{\exp^2(z)+1}+\frac{3}{\exp^6(z)+1}+\frac{5}{\exp^{10}(z)+1}\right) \text{ for } z=1$$

Series representations:

$$1-24\left(\frac{1}{e^2+1}+\frac{3}{e^6+1}+\frac{5}{e^{10}+1}\right)=1-\frac{24}{1+\sum_{k=0}^{\infty}\frac{2^k}{k!}}-\frac{72}{1+\sum_{k=0}^{\infty}\frac{6^k}{k!}}-\frac{120}{1+\sum_{k=0}^{\infty}\frac{10^k}{k!}}$$

$$1-24\left(\frac{1}{e^2+1}+\frac{3}{e^6+1}+\frac{5}{e^{10}+1}\right)=$$
$$1-\frac{24}{1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2}-\frac{72}{1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^6}-\frac{120}{1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{10}}$$

$$1-24\left(\frac{1}{e^2+1}+\frac{3}{e^6+1}+\frac{5}{e^{10}+1}\right)=$$
$$1-\frac{120}{1+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^{10}}}-\frac{72}{1+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^{6}}}-\frac{24}{1+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^{2}}}$$

1-240((((1/(e^2+1))-8/(e^4-1)+27/(e^6+1)))

Input:

$$1-240\left(\frac{1}{e^2+1}-\frac{8}{e^4-1}+\frac{27}{e^6+1}\right)$$

Decimal approximation:

-7.80916744185537906767583168253422663765526062090552087183...

-7.8091674418…

Property:

$1-240\left(\frac{1}{1+e^2}-\frac{8}{-1+e^4}+\frac{27}{1+e^6}\right)$ is a transcendental number

Alternate forms:

$$\frac{8639-8879\,e^2+2400\,e^4-241\,e^6+e^8}{(e-1)(1+e)\left(1+e^2\right)\left(1-e^2+e^4\right)}$$

$$1-\frac{240}{1+e^2}+\frac{1920}{e^4-1}-\frac{6480}{1+e^6}$$

$$1+\frac{480}{e-1}-\frac{480}{1+e}-\frac{3360}{1+e^2}+\frac{2160\,(e^2-2)}{1-e^2+e^4}$$

Alternative representation:

$$1-240\left(\frac{1}{e^2+1}-\frac{8}{e^4-1}+\frac{27}{e^6+1}\right)=1-240\left(\frac{1}{\exp^2(z)+1}-\frac{8}{\exp^4(z)-1}+\frac{27}{\exp^6(z)+1}\right)\text{ for } z=1$$

Series representations:

$$1-240\left(\frac{1}{e^2+1}-\frac{8}{e^4-1}+\frac{27}{e^6+1}\right)=1-\frac{240}{1+\sum_{k=0}^{\infty}\frac{2^k}{k!}}+\frac{1920}{-1+\sum_{k=0}^{\infty}\frac{4^k}{k!}}-\frac{6480}{1+\sum_{k=0}^{\infty}\frac{6^k}{k!}}$$

$$1-240\left(\frac{1}{e^2+1}-\frac{8}{e^4-1}+\frac{27}{e^6+1}\right)=\frac{8639-8879\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2+2400\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^4-241\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^6+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^8}{\left(-1+\sum_{k=0}^{\infty}\frac{1}{k!}\right)\left(1+\sum_{k=0}^{\infty}\frac{1}{k!}\right)\left(1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2\right)\left(1-\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^4\right)}$$

$$1-240\left(\frac{1}{e^2+1}-\frac{8}{e^4-1}+\frac{27}{e^6+1}\right)=\frac{2211584-568256\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^2+38400\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^4-964\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^6+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^8}{\left(-2+\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)\left(2+\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)\left(4+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^2\right)\left(16-4\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^2+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^4\right)}$$

((1+504((((1/(e^2+1))-32/(e^4-1)+3^5/(e^6+1))))))

Input:

$$1+504\left(\frac{1}{e^2+1}-\frac{32}{e^4-1}+\frac{3^5}{e^6+1}\right)$$

Decimal approximation:

62.99946799157348527622354539079353528072991183899603648222...

62.99946799157…

Property:

$$1+504\left(\frac{1}{1+e^2}-\frac{32}{-1+e^4}+\frac{243}{1+e^6}\right) \text{ is a transcendental number}$$

Alternate forms:

$$\frac{-139\,105+139\,609\,e^2-17\,136\,e^4+503\,e^6+e^8}{(e-1)(1+e)(1+e^2)(1-e^2+e^4)}$$

$$1+\frac{504}{1+e^2}-\frac{16\,128}{e^4-1}+\frac{122\,472}{1+e^6}$$

$$1-\frac{4032}{e-1}+\frac{4032}{1+e}+\frac{49\,392}{1+e^2}-\frac{40\,824\,(e^2-2)}{1-e^2+e^4}$$

Alternative representation:

$$1+504\left(\frac{1}{e^2+1}-\frac{32}{e^4-1}+\frac{3^5}{e^6+1}\right)=$$
$$1+504\left(\frac{1}{\exp^2(z)+1}-\frac{32}{\exp^4(z)-1}+\frac{3^5}{\exp^6(z)+1}\right) \text{ for } z=1$$

Series representations:

$$1+504\left(\frac{1}{e^2+1}-\frac{32}{e^4-1}+\frac{3^5}{e^6+1}\right)=1+\frac{504}{1+\sum_{k=0}^{\infty}\frac{2^k}{k!}}-\frac{16\,128}{-1+\sum_{k=0}^{\infty}\frac{4^k}{k!}}+\frac{122\,472}{1+\sum_{k=0}^{\infty}\frac{6^k}{k!}}$$

$$1+504\left(\frac{1}{e^2+1}-\frac{32}{e^4-1}+\frac{3^5}{e^6+1}\right)=$$
$$\frac{-139\,105+139\,609\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2-17\,136\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^4+503\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^6+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^8}{\left(-1+\sum_{k=0}^{\infty}\frac{1}{k!}\right)\left(1+\sum_{k=0}^{\infty}\frac{1}{k!}\right)\left(1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2\right)\left(1-\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^4\right)}$$

$$1+504\left(\frac{1}{e^2+1}-\frac{32}{e^4-1}+\frac{3^5}{e^6+1}\right)=\left(-1-503\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^2+\right.$$
$$\left.17\,136\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^4-139\,609\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^6+139\,105\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^8\right)\Big/$$
$$\left(\left(-1+\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\left(1+\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\left(1+\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^2\right)\left(1-\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^2+\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^4\right)\right)$$

From the algebraic sum, we obtain:

-62.99946799157-7.8091674418-2.04434674

-(-62.99946799157-7.8091674418-2.04434674)

Input interpretation:

$$-(-62.99946799157-7.8091674418-2.04434674)$$

Result:

72.85298217337

72.85298217337

sqrt(-(-62.99946799157-7.8091674418-2.04434674))-1/(2sqrt2)

Input interpretation:

$$\sqrt{-(-62.99946799157-7.8091674418-2.04434674)}-\frac{1}{2\sqrt{2}}$$

Result:

8.1818424510...

8.1818424510….

From:

Magnetic black holes in Weitzenbock geometry
Gamal G. L. Nashed and Salvatore Capozziello - arXiv:1903.11165v1 [gr-qc] 26 Mar 2019

Let us now discuss some thermodynamical quantities related to the solution (18). To this aim, we calculate the horizons of the function

$$\mathcal{N} = \frac{\Lambda r^2}{3} - \frac{m}{r} - \frac{q^2}{r^2}. \tag{22}$$

The above equation has 4 roots, 3 of them are imaginary while the fourth one is real and takes the form

$$\frac{3^{2/3}[2^{5/6}\{X^{2/3}-4q^2{\Lambda_1}^{1/3}\}^{3/4}+2^{7/12}\sqrt{X^{2/3}\sqrt{2(X^{2/3}-4q^2{\Lambda_1}^{1/3})}+2^{5/2}{\Lambda_1}^{1/3}q^2(X^{2/3}-4q^2\Lambda_1^{1/3})-12m\sqrt{X}}]}{12\Lambda^{1/3}X^{1/6}[X^{2/3}-4q^2{\Lambda_1}^{1/3}]^{1/4}}, \tag{23}$$

where $\Lambda_1 = 12\Lambda$ and $X = 9m^2+\sqrt{3(256q^2\Lambda+27m^4)}$. To ensure we have a real root, we must have $\Lambda > -\frac{27m^4}{256q^6}$. The behavior of the horizon is drawn in Figure 2 which shows that we have only one horizon. The Hawking temperature is defined as [71]

$$T_h = \frac{\mathcal{N}'(r_h)}{4\pi}, \tag{24}$$

where the event horizon is located at $r = r_h$ which is the largest positive root of $\mathcal{N}(r_h) = 0$ that fulfills the condition $\mathcal{N}'(r_h) \neq 0$. The Hawking temperatures associated with the black hole solution (18) is calculated as

$$T_h = \frac{3{r_h}^4\Lambda+q^2}{4\pi {r_h}^3}, \tag{25}$$

where T_h is the Hawking temperature at the event horizon. We represent the Hawking temperature in Figure 3. This last figure shows that the temperature is always positive.

We have that:

$$\Lambda_1 = 12\Lambda \text{ and } X = 9m^2+\sqrt{3(256q^2\Lambda+27m^4)}.$$

For Λ = 0.58 , m = 1 and q = 0.1,

Λ_1 = 12*0.58 = 6.96 X = 9+sqrt(3(256*0.1^2*0.58+27)) = 18.24415 , we obtain:

$$\frac{3^{2/3}[2^{5/6}\{X^{2/3}-4q^2{\Lambda_1}^{1/3}\}^{3/4}+2^{7/12}\sqrt{X^{2/3}\sqrt{2(X^{2/3}-4q^2{\Lambda_1}^{1/3})}+2^{5/2}{\Lambda_1}^{1/3}q^2(X^{2/3}-4q^2\Lambda_1^{1/3})-12m\sqrt{X}}]}{12\Lambda^{1/3}X^{1/6}[X^{2/3}-4q^2{\Lambda_1}^{1/3}]^{1/4}}, \tag{23}$$

sqrt[((((18.24415^(2/3)*sqrt(((2(18.24415^(2/3)-4*0.1^2*(6.96)^(1/3))))))+2^2.5*6.96^(1/3)*0.1^2(((18.24415^(2/3)-4*0.1^2*(6.96)^(1/3)))-12sqrt(18.24415)))))]

Input interpretation:

$$\sqrt{\left(18.24415^{2/3}\sqrt{2\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)}+2^{2.5}\sqrt[3]{6.96}\times 0.1^2\left(\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)-12\sqrt{18.24415}\right)\right)}$$

Result:

4.56760...

4.56760…

3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-
4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760))))))

Input interpretation:

$$3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.56760\right)\right)$$

Result:

41.0643...

41.0643…. result (numerator)

$$12\Lambda^{1/3}X^{1/6}[X^{2/3}-4q^2\Lambda_1{}^{1/3}]^{1/4}$$

Considering $12\Lambda^{1/3} = \Lambda_1{}^{1/3}$, we obtain:

(6.96)^(1/3)*18.24415^(1/6)*(((((18.44215^(2/3)-4*0.1^2*(6.96)^(1/3)))))^(1/4)

Input interpretation:

$$\sqrt[3]{6.96}\sqrt[6]{18.24415}\sqrt[4]{18.44215^{2/3}-4\times 0.1^2\sqrt[3]{6.96}}$$

Result:

5.02147...

5.02147….result (denominator)

Thence, in conclusion:

(((3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-
4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760)))))))) / (5.02147)

Input interpretation:

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.56760\right)\right)}{5.02147}$$

Result:

8.17775...

8.17775… final result

From which:

[(((3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760)))))))) / (5.02147)]^1/((1232 π)/(891.66))-47/10^4

Where 1232 is equal to the rest mass of Delta baryon, while 891.66 is equal to the rest mass of Kaon meson

Input interpretation:

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.56760\right)\right)}{5.02147}}-\frac{47}{10^4}$$

Result:

1.618042493925133599357798992661632953796954718331165439046...

1.618042493925….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternative representations:

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10^4}+\sqrt[\frac{221760^\circ}{891.66}]{\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5.02147}}$$

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10^4}+\left(\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5.02147}\right)^{-1/\left(\frac{1232\,i\log(-1)}{891.66}\right)}$$

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10^4}+\sqrt[\frac{1232\cos^{-1}(-1)}{891.66}]{\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5.02147}}$$

Series representations:

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10\,000}+8.17775^{0.180937/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)}$$

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10\,000}+8.17775^{0.361875/\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)}$$

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10\,000}+8.17775^{0.72375/\left(\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)}$$

Integral representations:

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=-\frac{47}{10\,000}+e^{0.76045/\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)}$$

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=$$
$$-\frac{47}{10000}+e^{0.380225/\left(\int_0^1\sqrt{1-t^2}\,dt\right)}$$

$$\sqrt[\frac{1232\pi}{891.66}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}-\frac{47}{10^4}=$$
$$-\frac{47}{10000}+e^{0.76045/\left(\int_0^\infty\frac{\sin(t)}{t}\,dt\right)}$$

Or:

1/5((((((3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760)))))))) / (5.02147))))-(5/(12Pi))^2

Input interpretation:

$$\frac{1}{5}\times\frac{3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.56760\right)\right)}{5.02147}-\left(\frac{5}{12\pi}\right)^2$$

Result:

1.617958958231125575058677537878281215545546640713924847377...

1.617958958231….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternative representations:

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\pi}\right)^2=$$
$$\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5\times 5.02147}-\left(\frac{5}{2160\,°}\right)^2$$

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\pi}\right)^2=$$
$$\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5\times 5.02147}-\left(-\frac{5}{12\,i\log(-1)}\right)^2$$

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\,\pi}\right)^2=$$
$$\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5\times 5.02147}-\left(\frac{5}{12\cos^{-1}(-1)}\right)^2$$

Series representations:

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\,\pi}\right)^2=$$
$$1.63555-\frac{25}{2304\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2}$$

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\,\pi}\right)^2=$$
$$1.63555-\frac{25}{576\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^2}$$

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\,\pi}\right)^2=$$
$$1.63555-\frac{25}{144\left(\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)^2}$$

Integral representations:

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\,\pi}\right)^2=$$
$$1.63555-\frac{25}{576\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^2}$$

$$\frac{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\pi}\right)^2}{1.63555-\frac{25}{2304\left(\int_0^1\sqrt{1-t^2}\,dt\right)^2}}=$$

$$\frac{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147\times 5}-\left(\frac{5}{12\pi}\right)^2}{1.63555-\frac{25}{576\left(\int_0^\infty\frac{\sin(t)}{t}\,dt\right)^2}}=$$

And again:

[(((3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760)))))))) / (5.02147)]^1/(((1024+64*3) π)/(1024-64*2))+(Pi-18-4)1/10^3

Input interpretation:

$$\sqrt[\frac{(1024+64\times 3)\pi}{1024-64\times 2}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.56760\right)\right)}{5.02147}}+(\pi-18-4)\times\frac{1}{10^3}$$

Result:

1.618157387573932912307908491527034872666689150111874646612...

1.6181573875739….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternative representations:

$$\sqrt[\frac{(1024+64\times 3)\pi}{1024-64\times 2}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{-22+180^\circ}{10^3}+\sqrt[\frac{218880^\circ}{896}]{\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5.02147}}$$

$$\sqrt[\frac{1024-64\times 2}{(1024+64\times 3)\pi}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{-22-i\log(-1)}{10^3}+\left(\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5.02147}\right)^{-1/\left(\frac{1216}{896}i\log(-1)\right)}$$

$$\sqrt[\frac{1024-64\times 2}{(1024+64\times 3)\pi}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{-22+\cos^{-1}(-1)}{10^3}+\sqrt[\frac{1216}{896}\cos^{-1}(-1)]{\frac{2^{5/6}\times 3^{2/3}\left(4.5676\times 2^{7/12}+\left(-4\times 0.1^2\sqrt[3]{6.96}+18.2442^{2/3}\right)^{3/4}\right)}{5.02147}}$$

Series representations:

$$\sqrt[\frac{1024-64\times 2}{(1024+64\times 3)\pi}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{1}{500}\left(-11+500\times 8.17775^{7/\left(38\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)}+2\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)$$

$$\sqrt[\frac{1024-64\times 2}{(1024+64\times 3)\pi}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{1}{500}\left(-12+500\,e^{0.774206/\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)}+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)$$

$$\sqrt[\frac{(1024+64\times 3)\pi}{1024-64\times 2}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{-22+1000\times 8.17775^{14/\left(19\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)}+\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}{1000}$$

Integral representations:

$$\sqrt[\frac{(1024+64\times 3)\pi}{1024-64\times 2}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{1}{500}\left(-11+500\,e^{0.774206/\left(\int_0^{\infty}\frac{1}{1+t^2}dt\right)}+\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)$$

$$\sqrt[\frac{(1024+64\times 3)\pi}{1024-64\times 2}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{1}{500}\left(-11+500\,e^{0.774206/\left(\int_0^{\infty}\frac{\sin(t)}{t}dt\right)}+\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)$$

$$\sqrt[\frac{(1024+64\times 3)\pi}{1024-64\times 2}]{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.2442^{2/3}-4\times 0.1^2\sqrt[3]{6.96}\right)^{3/4}+2^{7/12}\times 4.5676\right)\right)}{5.02147}}+\frac{\pi-18-4}{10^3}=\frac{1}{500}\left(-11+500\,e^{0.387103/\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)}+2\int_0^{1}\sqrt{1-t^2}\,dt\right)$$

From

$$12\Lambda^{1/3}X^{1/6}[X^{2/3}-4q^2\Lambda_1{}^{1/3}]^{1/4}$$

Considering $12\Lambda^{1/3} = 12*\Lambda^{1/3}$ = 12*(0.58)^1/3 , we obtain:

12*(0.58)^1/3*18.24415^(1/6)*(((((18.44215^(2/3)-4*0.1^2*(6.96)^(1/3))))))^(1/4)

Input interpretation:

$$12 \sqrt[3]{0.58} \sqrt[6]{18.24415} \sqrt[4]{18.44215^{2/3} - 4 \times 0.1^2 \sqrt[3]{6.96}}$$

Result:

26.3200...

26.3200…

Thence:

(((3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760)))))))) / (26.32)

Input interpretation:

$$\frac{3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3} - 4 \times 0.1^2 \sqrt[3]{6.96}\right)^{3/4} + 2^{7/12} \times 4.56760\right)\right)}{26.32}$$

Result:

1.560194235186337315557260895081058679281833362829444845788...

1.56019423518633...... final result

From which:

1+1/(((((((3^(2/3)*(((((2^(5/6)((((18.24415^(2/3)-4(0.1)^2*(6.96)^(1/3))))^(3/4)+2^(7/12)*4.56760)))))))) / (26.32)))))-(21+2)1/10^3

Input interpretation:

$$1 + \frac{1}{\frac{3^{2/3}\left(2^{5/6}\left(\left(18.24415^{2/3} - 4 \times 0.1^2 \sqrt[3]{6.96}\right)^{3/4} + 2^{7/12} \times 4.56760\right)\right)}{26.32}} - (21+2) \times \frac{1}{10^3}$$

Result:

1.617945837029431065235498827801352686030862200727108968230...

1.617945837...... result that is a very good approximation to the value of the golden ratio 1.618033988749...

From the previous Ramanujan expression, we obtain:

((62.99946799157-7.8091674418-2.04434674))^1/9

Input interpretation:

$$\sqrt[9]{62.99946799157 - 7.8091674418 - 2.04434674}$$

Result:

1.5549588904...

1.5549588904…. result very near to the previous value 1.56019423518633

And:

((62.99946799157-7.8091674418-2.04434674))^1/8-(18+7)1/10^3

Input interpretation:

$$\sqrt[8]{62.99946799157 - 7.8091674418 - 2.04434674} - (18+7)\times\frac{1}{10^3}$$

Result:

1.6181748372...

1.6181748372…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Now, we have that:

The general solutions of the non-linear differential Eqs. (14) have the form:

$$i)\ A(r) = \frac{1}{A_1(r)} = \left(\frac{\Lambda r^3 - 3c_1}{3r}\right),\quad a(\phi) = c_2\phi,\quad a_1(z) = c_3 z,\quad s(\phi) = c_4\phi,\quad b(z) = c_5 z,$$

$$s_1(r) = c_6 r,\quad b_1(r) = c_7 r,$$

$$ii)\ A(r) = \frac{1}{A_1(r)} = \left(\frac{\Lambda r^4 - 3c_1 r - 3c_8}{3r^2}\right),\quad a(\phi) = c_2\phi,\quad a_1(z) = c_3 z,\quad s(\phi) = \pm\wp\phi,$$

$$b(z) = \wp^2 z,\quad s_1(r) = c_6 r,\quad b_1(r) = c_7 r,\qquad \wp = \frac{1 \pm \sqrt{1 \pm 4\sqrt{c_8}}}{2}, \tag{16}$$

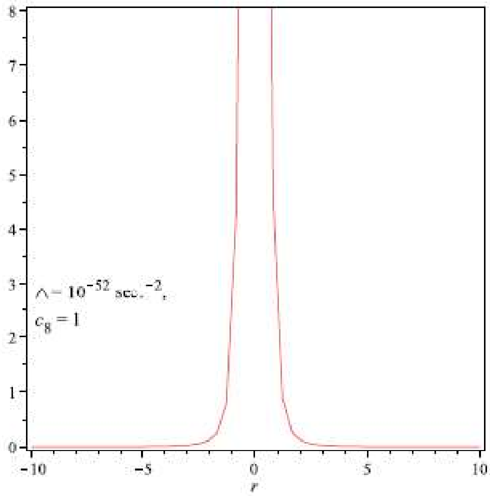


FIG. 1: The behavior of the torsion scalar for the second solution (16).

For $c_8 = 1$, from

$$\wp = \frac{1 \pm \sqrt{1 \pm 4\sqrt{c_8}}}{2},$$

We obtain:

(1+sqrt(1+4))/2 and (1-sqrt(1-4))/2

Thence:

(1+sqrt(1+4))/2

Input:

$$\frac{1}{2}\left(1+\sqrt{1+4}\right)$$

Result:

$$\frac{1}{2}\left(1+\sqrt{5}\right)$$

Decimal approximation:

1.6180339887498948482045868343656381177203091798057628621354...

1.6180339887…. = golden ratio

Alternate form:

$$\frac{1}{2}+\frac{\sqrt{5}}{2}$$

Minimal polynomial:

$$x^2-x-1$$

(1-sqrt(1-4))/2

Input:

$$\frac{1}{2}\left(1-\sqrt{1-4}\right)$$

Result:

$$\frac{1}{2}\left(1-i\sqrt{3}\right)$$

Decimal approximation:

0.5 −
0.86602540378443864676372317075293618347140262690519031402... i

Polar coordinates:

$r=1$ (radius), $\theta=-60°$ (angle)

1

Alternate forms:

$$\frac{1}{2}-\frac{i\sqrt{3}}{2}$$

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

Minimal polynomial:

$$x^2-x+1$$

If we multiply the two results, we obtain again:

(1+sqrt(1+4))/2 * (1-sqrt(1-4))/2

Input:

$$\left(\frac{1}{2}\left(1+\sqrt{1+4}\right)\right)\left(\frac{1}{2}\left(1-\sqrt{1-4}\right)\right)$$

Result:

$$\frac{1}{4}\left(1-i\sqrt{3}\right)\left(1+\sqrt{5}\right)$$

Decimal approximation:

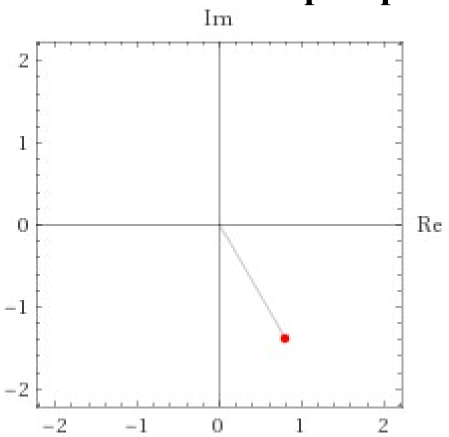
0.80901699437494742410229341718281905886015458990288143106... −
1.4012585384440735446766779353220679944439317397754928636... i

Polar coordinates:

$r \approx 1.61803$ (radius), $\theta = -60°$ (angle)

1.61803 result that is a very good approximation to the value of the golden ratio 1.618033988749...

Position in the complex plane:



Alternate forms:

$$-\frac{1}{4}i\left(\sqrt{3}+i\right)\left(1+\sqrt{5}\right)$$

$$\frac{1}{4}\left(1+\sqrt{5}-i\sqrt{6\left(3+\sqrt{5}\right)}\right)$$

$$\frac{1}{4}-\frac{i\sqrt{3}}{4}+\frac{\sqrt{5}}{4}-\frac{i\sqrt{15}}{4}$$

Minimal polynomial:

$x^4 - x^3 + 2x^2 + x + 1$

From

$$b(z) = \wp^2 z,$$

we obtain:

8*((((1+sqrt(1+4))/2)))^2

Input:

$8\left(\frac{1}{2}\left(1+\sqrt{1+4}\right)\right)^2$

Result:

$2\left(1+\sqrt{5}\right)^2$

Decimal approximation:

20.944271909999158785636694674925104941762473438446102897083...

20.944271909…

Alternate forms:

$4\left(3+\sqrt{5}\right)$

$12+4\sqrt{5}$

Minimal polynomial:

$x^2 - 24x + 64$

8*((((1-sqrt(1-4))/2)))^2

Input:

$8\left(\frac{1}{2}\left(1-\sqrt{1-4}\right)\right)^2$

Result:

$2\left(1-i\sqrt{3}\right)^2$

Decimal approximation:

$-4-6.9282032302755091741097853660234894677712210152415225122\ldots\, i$

Polar coordinates:

$r = 8$ (radius), $\theta = -120°$ (angle)

8

Alternate forms:

$8\, e^{-(2 i \pi)/3}$

$-4 - 4 i \sqrt{3}$

$-2\left(\sqrt{3} + i\right)^2$

Minimal polynomial:

$x^2 + 8x + 64$

8*((((1+sqrt(1+4))/2)))^2 * 8*((((1-sqrt(1-4))/2)))^2

Input:

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

Result:

$4\left(1 - i\sqrt{3}\right)^2\left(1+\sqrt{5}\right)^2$

Decimal approximation:

$-83.777087639996635142546778699700419767049893753784411588\ldots - 145.10617230262478025218567078880026738658139946756372337\ldots\, i$

Polar coordinates:

$r \approx 167.554$ (radius), $\theta = -120°$ (angle)

167.554

Alternate forms:

$-16\left(3+\sqrt{5}\right)\left(1 + i\sqrt{3}\right)$

$16\left(1+\sqrt{5}\right)^2 e^{-(2 i \pi)/3}$

$-8\left(2+2 i \sqrt{3}\right)\left(3+\sqrt{5}\right)$

Minimal polynomial:

$x^4 + 192 x^3 + 32768 x^2 + 786432 x + 16777216$

-34i-(((8*((((1+sqrt(1+4))/2)))^2 * 8*((((1-sqrt(1-4))/2)))^2)))

Input:

$-34 i - 8\left(\frac{1}{2}\left(1+\sqrt{1+4}\right)\right)^2 \times 8\left(\frac{1}{2}\left(1-\sqrt{1-4}\right)\right)^2$

i is the imaginary unit

Result:

$-34 i - 4\left(1 - i\sqrt{3}\right)^2\left(1+\sqrt{5}\right)^2$

Decimal approximation:

83.777087639996635142546778699700419767049893753784411588 3... +
111.106172302624780252185670788800267386581399467563723372... i

Polar coordinates:

$r \approx 139.152$ (radius), $\theta \approx 52.9827°$ (angle)

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

Alternate forms:

$16\left(3+\sqrt{5}+3\sqrt{3}\, i+\sqrt{15}\, i\right) - 34 i$

$-34 i - 16\left(1+\sqrt{5}\right)^2 e^{-(2 i \pi)/3}$

$-34 i + 8\left(2+2 i\sqrt{3}\right)\left(3+\sqrt{5}\right)$

Minimal polynomial:

$x^8 - 384 x^7 + 107024 x^6 - 15487488 x^5 + 1620908128 x^4 - 84976748544 x^3 + 4034133647616 x^2 - 74728224350208 x + 759050023239936$

-55i+3i-(((8*((((1+sqrt(1+4))/2)))^2 * 8*((((1-sqrt(1-4))/2)))^2)))

Input:

$$-55\,i+3\,i-8\left(\frac{1}{2}\left(1+\sqrt{1+4}\right)\right)^2\times 8\left(\frac{1}{2}\left(1-\sqrt{1-4}\right)\right)^2$$

i is the imaginary unit

Result:

$$-52\,i-4\left(1-i\sqrt{3}\right)^2\left(1+\sqrt{5}\right)^2$$

Decimal approximation:

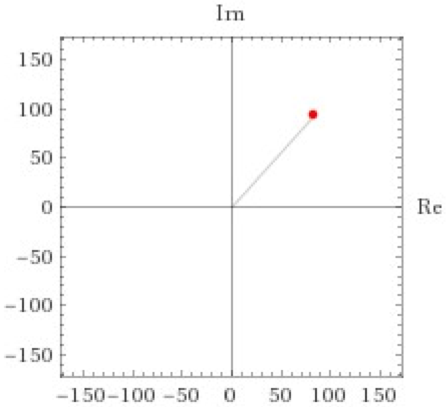
83.777087639996635142546778699700419767049893753784411588 3... +
93.106172302624780252185670788800267386581399467563723372 0... i

Polar coordinates:

$r \approx 125.249$ (radius), $\theta \approx 48.0191°$ (angle)

125.249 result very near to the Higgs boson mass 125.18 GeV

Position in the complex plane:



Alternate forms:

$$48+16\sqrt{5}+48\sqrt{3}\,i+16\sqrt{15}\,i-52\,i$$

$$-52\,i-16\left(1+\sqrt{5}\right)^2 e^{-(2\,i\,\pi)/3}$$

$$-52\,i+8\left(2+2\,i\sqrt{3}\right)\left(3+\sqrt{5}\right)$$

Minimal polynomial:

$$x^8-384\,x^7+113\,216\,x^6-17\,270\,784\,x^5+1\,929\,405\,952\,x^4-125\,947\,379\,712\,x^3+7\,388\,910\,206\,976\,x^2-178\,583\,017\,881\,600\,x+4\,355\,440\,454\,467\,584$$

(27*1/2)i(((-47i-i-(((8*((((1+sqrt(1+4))/2)))^2 * 8*((((1-sqrt(1-4))/2)))^2))))))-Pi*i

Input:

$$\left(27\times\frac{1}{2}\right)i\left(-47\,i-i-8\left(\frac{1}{2}\left(1+\sqrt{1+4}\right)\right)^2\times 8\left(\frac{1}{2}\left(1-\sqrt{1-4}\right)\right)^2\right)-\pi\,i$$

i is the imaginary unit

Result:

$$\frac{27}{2}\,i\left(-48\,i-4\left(1-i\sqrt{3}\right)^2\left(1+\sqrt{5}\right)^2\right)-i\,\pi$$

Decimal approximation:

$$-1310.933326085434533404506555648803609718848892812 1102655\ldots+1127.849090486364781185918869062676163970976396276 7144506\ldots\,i$$

Property:

$\frac{27}{2}\,i\left(-48\,i-4\left(1-i\sqrt{3}\right)^2\left(1+\sqrt{5}\right)^2\right)-i\,\pi$ is a transcendental number

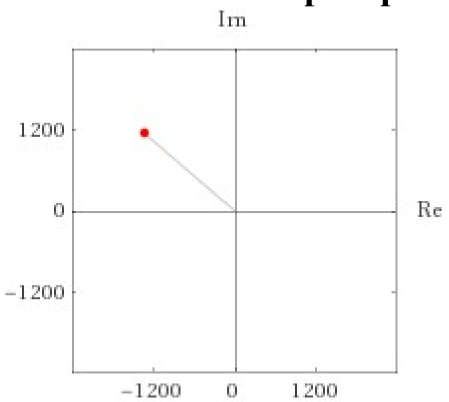
Polar coordinates:

$r\approx 1729.33$ (radius), $\theta\approx 139.293°$ (angle)

1729.33

This result is very near to the mass of candidate glueball **f_0(1710) scalar 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)

Position in the complex plane:



Alternate forms:

$$648 + 648\,i - 648\sqrt{3} + 216\,i\sqrt{5} - 216\sqrt{15} - i\pi$$

$$(648 + 648\,i) - 648\sqrt{3} + 216\,i\sqrt{5} - 216\sqrt{15} - i\pi$$

$$-216\left((-3 - 3\,i) + 3\sqrt{3} - i\sqrt{5} + \sqrt{15}\right) - i\pi$$

Series representations:

$$\frac{1}{2}\left(i\left(-47\,i - i - 8\left(\frac{1}{2}\left(1 + \sqrt{1+4}\right)\right)^2 8\left(\frac{1}{2}\left(1 - \sqrt{1-4}\right)\right)^2\right)\right)27 - i\pi = -i\pi + \frac{27}{2}\,i\left(-48\,i - 4\left(-1 + \sqrt{-4}\sum_{k=0}^{\infty}(-4)^{-k}\binom{\frac{1}{2}}{k}\right)^2\left(1 + \sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^2\right)$$

$$\frac{1}{2}\left(i\left(-47\,i - i - 8\left(\frac{1}{2}\left(1 + \sqrt{1+4}\right)\right)^2 8\left(\frac{1}{2}\left(1 - \sqrt{1-4}\right)\right)^2\right)\right)27 - i\pi = -i\pi + \frac{27}{2}\,i\left(-48\,i - 4\left(1 + \sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^2\left(-1 + \sqrt{-4}\sum_{k=0}^{\infty}\frac{4^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2\right)$$

$$\frac{1}{2}\left(i\left(-47\,i - i - 8\left(\frac{1}{2}\left(1 + \sqrt{1+4}\right)\right)^2 8\left(\frac{1}{2}\left(1 - \sqrt{1-4}\right)\right)^2\right)\right)27 - i\pi = -i\pi + \frac{27}{2}\,i\left(-48\,i - 4\left(1 - \sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(-3 - z_0)^k z_0^{-k}}{k!}\right)^2\left(1 + \sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5 - z_0)^k z_0^{-k}}{k!}\right)^2\right)$$

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

Now:

$$A(r) = \frac{1}{A_1(r)} = \left(\frac{\Lambda r^3 - 3c_1}{3r}\right),$$

$$c_1 = \frac{r^3\Lambda}{3}$$

For $\Lambda = 0.58$, $r = 0.5$ $c_1 = (0.5^3 * 0.58)/3 = 0.02416...$, we obtain:

((0.58*0.5^3 – 3*0.02416)/(3*0.5))

Input:

$$\frac{0.58\times 0.5^3 - 3\times 0.02416}{3\times 0.5}$$

Result:

0.0000133333333333333333333333333333333333333333333333333...

0.000013333…

Repeating decimal:

$0.00001\overline{3}$ (period 1)

From

$$A(r) = \frac{1}{A_1(r)} = \left(\frac{\Lambda r^4 - 3c_1 r - 3c_8}{3r^2}\right),$$

For Λ = 0.58, r = 0.5 c_1 = (0.5^3 * 0.58)/3 = 0.02416..., c_8 = 1, we obtain:

we obtain:

((0.58*0.5^4-3*0.02416*0.5-3)/(3*0.5^2))

Input:

$$\frac{0.58\times 0.5^4 - 3\times 0.02416\times 0.5 - 3}{3\times 0.5^2}$$

Result:

−3.99998666666666666666666666666666666666666666666666666...

-3.999986666….

Repeating decimal:

$-3.99998\overline{6}$ (period 1)

Summing this result with the previous with minus sign, we obtain

-3.999986-((0.58*0.5^3 – 3*0.02416)/(3*0.5))

Input interpretation:

$$-3.999986-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}$$

Result:

−3.9999993333333333333333333333333333333333333333333333333...

-3.9999993333….

Repeating decimal:

$-3.999999\overline{3}$ (period 1)

From which:

-2((((-3.999986-((0.58*0.5^3 – 3*0.02416)/(3*0.5))))))^3-3+1/golden ratio

Input interpretation:

$$-2\left(-3.999986-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3-3+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.618...

125.618… result very near to the Higgs boson mass 125.18 GeV

Alternative representations:

$$-2\left(-3.99999-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3-3+\frac{1}{\phi}=$$

$$-3-2\left(-3.99999-\frac{-0.07248+0.58\times 0.5^3}{1.5}\right)^3+\frac{1}{2\sin(54^\circ)}$$

$$-2\left(-3.99999-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3-3+\frac{1}{\phi}=$$
$$-3+-\frac{1}{2\cos(216\,°)}-2\left(-3.99999-\frac{-0.07248+0.58\times 0.5^3}{1.5}\right)^3$$

$$-2\left(-3.99999-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3-3+\frac{1}{\phi}=$$
$$-3-2\left(-3.99999-\frac{-0.07248+0.58\times 0.5^3}{1.5}\right)^3+-\frac{1}{2\sin(666\,°)}$$

-2((((-3.999986-((0.58*0.5^3 – 3*0.02416)/(3*0.5))))))^3+11+1/golden ratio

Input interpretation:

$$-2\left(-3.999986-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3+11+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.618...

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

Alternative representations:

$$-2\left(-3.99999-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3+11+\frac{1}{\phi}=$$
$$11-2\left(-3.99999-\frac{-0.07248+0.58\times 0.5^3}{1.5}\right)^3+\frac{1}{2\sin(54\,°)}$$

$$-2\left(-3.99999-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3+11+\frac{1}{\phi}=$$
$$11+-\frac{1}{2\cos(216\,°)}-2\left(-3.99999-\frac{-0.07248+0.58\times 0.5^3}{1.5}\right)^3$$

$$-2\left(-3.99999-\frac{0.58\times 0.5^3-3\times 0.02416}{3\times 0.5}\right)^3+11+\frac{1}{\phi}=$$
$$11-2\left(-3.99999-\frac{-0.07248+0.58\times 0.5^3}{1.5}\right)^3+-\frac{1}{2\sin(666\,°)}$$

Now, for q = 0.1, $r_h = r = 0.5$, $\Lambda = 0.58$, we from:

$$T_h = \frac{3{r_h}^4\Lambda + q^2}{4\pi {r_h}^3},$$

We obtain:

(3*0.5^4*0.58 + 0.1^2) / (4*Pi*0.5^3)

Input:

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\,\pi\times 0.5^3}$$

Result:

0.0755986...

0.0755986…

Alternative representations:

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\,\pi\,0.5^3}=\frac{0.1^2+1.74\times 0.5^4}{720\,^\circ\,0.5^3}$$

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\,\pi\,0.5^3}=-\frac{0.1^2+1.74\times 0.5^4}{4\,i\log(-1)\,0.5^3}$$

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\,\pi\,0.5^3}=\frac{0.1^2+1.74\times 0.5^4}{4\cos^{-1}(-1)\,0.5^3}$$

Series representations:

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\,\pi\,0.5^3}=\frac{0.059375}{\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}$$

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\,\pi\,0.5^3}=\frac{0.11875}{-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}}$$

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\, 0.5^3}=\frac{0.2375}{\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\, 0.5^3}=\frac{0.11875}{\int_0^{\infty}\frac{1}{1+t^2}\,dt}$$

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\, 0.5^3}=\frac{0.059375}{\int_0^{1}\sqrt{1-t^2}\,dt}$$

$$\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\, 0.5^3}=\frac{0.11875}{\int_0^{\infty}\frac{\sin(t)}{t}\,dt}$$

From which:

(((-ln((((3*0.5^4*0.58 + 0.1^2) / (4*Pi*0.5^3)))))))^1/2 + 11/10^3

Input:

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\times 0.5^3}\right)}+\frac{11}{10^3}$$

log(x) is the natural logarithm

Result:

1.61796...

1.61796…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternative representations:

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\, 0.5^3}\right)}+\frac{11}{10^3}=\sqrt{-\log_e\left(\frac{0.1^2+1.74\times 0.5^4}{4\pi\, 0.5^3}\right)}+\frac{11}{10^3}$$

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}=\sqrt{-\log(a)\log_a\left(\frac{0.1^2+1.74\times 0.5^4}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}$$

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}=\sqrt{\mathrm{Li}_1\left(1-\frac{0.1^2+1.74\times 0.5^4}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}$$

Series representations:

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}=\frac{11}{1000}+\sqrt{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{0.2375}{\pi}\right)^k}{k}}$$

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}=$$
$$\frac{11}{1000}+\sqrt{-2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{0.2375}{\pi}-x\right)}{2\pi}\right\rfloor-\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{0.2375}{\pi}-x\right)^k x^{-k}}{k}}\quad\text{for } x<0$$

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}=\frac{11}{1000}+$$
$$\sqrt{-\log(z_0)-\left\lfloor\frac{\arg\left(\frac{0.2375}{\pi}-z_0\right)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)+\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{0.2375}{\pi}-z_0\right)^k z_0^{-k}}{k}}$$

Integral representation:

$$\sqrt{-\log\left(\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi\,0.5^3}\right)}+\frac{11}{10^3}=\frac{11}{1000}+\sqrt{-\int_1^{\frac{0.2375}{\pi}}\frac{1}{t}\,dt}$$

And:

sqrt(Pi) 1/((((3*0.5^4*0.58 + 0.1^2) 1/ (4*Pi*0.5^3))))

Input:

$$\sqrt{\pi}\times\frac{1}{\left(3\times 0.5^4\times 0.58+0.1^2\right)\times\frac{1}{4\pi\times 0.5^3}}$$

Result:

23.4456...

23.4456… result very near to the black hole entropy 23.3621 that is equal to ln(13996384631)

Series representations:

$$\frac{\sqrt{\pi}}{\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi 0.5^3}} = 4.21053\,\pi\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}$$

$$\frac{\sqrt{\pi}}{\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi 0.5^3}} = 4.21053\,\pi\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$\frac{\sqrt{\pi}}{\frac{3\times 0.5^4\times 0.58+0.1^2}{4\pi 0.5^3}} = 4.21053\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\pi-z_0)^k z_0^{-k}}{k!}$$

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

Now, we have the following invariant:

$$T^{\mu\nu\lambda}T_{\mu\nu\lambda} = \frac{4\Lambda^2 r^8 - 8\Lambda c_8 r^4 - 12\Lambda c_1 r^5 + 27r^2{c_1}^2 + 60c_1c_8 r + 36{c_8}^2}{2r^4(3c_1 r - \Lambda r^4 + 3c_8)},$$

For Λ = 0.58, r = 0.5 c_1 = (0.5^3 * 0.58)/3 = 0.02416..., we obtain:

(((4*0.58^2*0.5^8-8*0.58*0.5^4-12*0.58*0.02416*0.5^5+27*0.5^2*0.02416^2+60*0.02416*0.5+36)))/(((2*0.5^4(3*0.02416*0.5-0.58*0.5^4+3))))

Input:

$$(4\times 0.58^2\times 0.5^8 - 8\times 0.58\times 0.5^4 - 12\times 0.58\times 0.02416\times 0.5^5 + 27\times 0.5^2\times 0.02416^2 + 60\times 0.02416\times 0.5 + 36)/(2\times 0.5^4(3\times 0.02416\times 0.5 - 0.58\times 0.5^4 + 3))$$

Result:

97.17030113513711712372374574581915273050910169700565668552...

97.170301135...

[(((4*0.58^2*0.5^8-8*0.58*0.5^4-12*0.58*0.02416*0.5^5+27*0.5^2*0.02416^2+60*0.02416*0.5+36)))/(((2*0.5^4(3*0.02416*0.5-0.58*0.5^4+3)))))]^1/9-(47-2)/10^3

Input:

$$((4\times 0.58^2\times 0.5^8-8\times 0.58\times 0.5^4-12\times 0.58\times 0.02416\times 0.5^5+27\times 0.5^2\times 0.02416^2+60\times 0.02416\times 0.5+36)/(2\times 0.5^4(3\times 0.02416\times 0.5-0.58\times 0.5^4+3)))\,\hat{}\,(1/9)-\frac{47-2}{10^3}$$

Result:

1.617788686593761388145660238109728589799216054335851019322...

1.61778868659…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

From

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

We have the following expression:

$$g_{310} = \left(\frac{1+\sqrt{5}}{2}\right)\sqrt{(1+\sqrt{2})}\left\{\sqrt{\left(\frac{7+2\sqrt{10}}{4}\right)}+\sqrt{\left(\frac{3+2\sqrt{10}}{4}\right)}\right\}$$

We obtain:

(((((1+sqrt5)/2) (sqrt(1+sqrt2)) [(1/4(7+2sqrt10))^1/2+ (1/4(3+2sqrt10))^1/2])))

Input:

$$\left(\frac{1}{2}\left(1+\sqrt{5}\right)\right)\sqrt{1+\sqrt{2}}\left(\sqrt{\frac{1}{4}\left(7+2\sqrt{10}\right)}+\sqrt{\frac{1}{4}\left(3+2\sqrt{10}\right)}\right)$$

Result:

$$\frac{1}{2}\sqrt{1+\sqrt{2}}\left(1+\sqrt{5}\right)\left(\frac{1}{2}\sqrt{3+2\sqrt{10}}+\frac{1}{2}\sqrt{7+2\sqrt{10}}\right)$$

Decimal approximation:

8.426994150036207565797584019482413033314505526338499017496...

8.426994150036…

Alternate forms:

$$\frac{1}{4}\left(\sqrt{3+2\sqrt{10}}+\sqrt{2}+\sqrt{5}+\sqrt{10}+\sqrt{5\left(3+2\sqrt{10}\right)}+5\right)\sqrt{1+\sqrt{2}}$$

$$\frac{1}{4}\sqrt{1+\sqrt{2}}\left(1+\sqrt{5}\right)\left(\sqrt{2}+\sqrt{5}+\sqrt{3+2\sqrt{10}}\right)$$

$$\frac{1}{8}\left(\sqrt{2-2i}+\sqrt{2+2i}\right)\left(1+\sqrt{5}\right)\left(\sqrt{3+2\sqrt{10}}+\sqrt{7+2\sqrt{10}}\right)$$

Minimal polynomial:

$$x^{16}-70x^{14}-73x^{12}+70x^{10}-52x^{8}-70x^{6}-73x^{4}+70x^{2}+1$$

From which:

11(((((1+sqrt5)/2) (sqrt(1+sqrt2)) [(1/4(7+2sqrt10))^1/2+(1/4(3+2sqrt10))^1/2])))+4+1/golden ratio

Input:

$$11\left(\left(\frac{1}{2}\left(1+\sqrt{5}\right)\right)\sqrt{1+\sqrt{2}}\left(\sqrt{\frac{1}{4}\left(7+2\sqrt{10}\right)}+\sqrt{\frac{1}{4}\left(3+2\sqrt{10}\right)}\right)\right)+4+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{1}{\phi}+4+\frac{11}{2}\sqrt{1+\sqrt{2}}\left(1+\sqrt{5}\right)\left(\frac{1}{2}\sqrt{3+2\sqrt{10}}+\frac{1}{2}\sqrt{7+2\sqrt{10}}\right)$$

Decimal approximation:

97.31496963914817807197801104867218148417986996952925205459...

97.31496963914…

Alternate forms:

$$\frac{1}{4}\left(55\sqrt{1+\sqrt{2}}+2\sqrt{5}+11\sqrt{2\left(1+\sqrt{2}\right)}+11\sqrt{5\left(1+\sqrt{2}\right)}+11\sqrt{10\left(1+\sqrt{2}\right)}+11\sqrt{\left(1+\sqrt{2}\right)\left(3+2\sqrt{10}\right)}+11\sqrt{5\left(1+\sqrt{2}\right)\left(3+2\sqrt{10}\right)}+14\right)$$

$$4+\frac{2}{1+\sqrt{5}}+\frac{11}{2}\sqrt{1+\sqrt{2}}\left(1+\sqrt{5}\right)\left(\frac{1}{2}\left(\sqrt{2}+\sqrt{5}\right)+\frac{1}{2}\sqrt{3+2\sqrt{10}}\right)$$

$$\frac{1}{\phi}+\frac{1}{4\sqrt{2}}\left(11\left(1+\sqrt{5}\right)\sqrt{\left(1+\sqrt{2}\right)\left(3-i\sqrt{31}\right)}+\sqrt{2}\left(16+11\sqrt{1+\sqrt{2}}\left(1+\sqrt{5}\right)\left(\sqrt{2}+\sqrt{5}+\sqrt{\frac{1}{2}i\left(\sqrt{31}+-3i\right)}\right)\right)\right)$$

Minimal polynomial:

$$x^{16}-56x^{15}-7010x^{14}+370\,940x^{13}-9\,259\,843x^{12}+162\,436\,528x^{11}-2\,035\,759\,790x^{10}+18\,034\,539\,640x^{9}-133\,900\,370\,067x^{8}+843\,839\,491\,572x^{7}-5\,340\,585\,816\,060x^{6}+32\,618\,526\,629\,040x^{5}-267\,817\,937\,030\,578x^{4}+4\,334\,501\,667\,844\,304x^{3}-1\,020\,950\,590\,127\,512x^{2}-53\,269\,453\,115\,638\,672x+121\,395\,850\,960\,684\,124$$

Series representations:

$$\frac{11}{2}\left(1+\sqrt{5}\right)\left(\sqrt{1+\sqrt{2}}\left(\sqrt{\frac{1}{4}\left(7+2\sqrt{10}\right)}+\sqrt{\frac{1}{4}\left(3+2\sqrt{10}\right)}\right)\right)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+\frac{11}{4}\left(1+\sqrt{5}\right)\left(\sqrt{3+2\sqrt{10}}+\sqrt{7+2\sqrt{10}}\right)\sqrt{\sqrt{2}}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\sqrt{2}^{-k}$$

$$\frac{11}{2}\left(1+\sqrt{5}\right)\left(\sqrt{1+\sqrt{2}}\left(\sqrt{\frac{1}{4}\left(7+2\sqrt{10}\right)}+\sqrt{\frac{1}{4}\left(3+2\sqrt{10}\right)}\right)\right)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+\frac{11}{4}\left(1+\sqrt{5}\right)\left(\sqrt{3+2\sqrt{10}}+\sqrt{7+2\sqrt{10}}\right)\sqrt{\sqrt{2}}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\sqrt{2}^{-k}}{k!}$$

$$\frac{11}{2}\left(1+\sqrt{5}\right)\left(\sqrt{1+\sqrt{2}}\left(\sqrt{\frac{1}{4}\left(7+2\sqrt{10}\right)}+\sqrt{\frac{1}{4}\left(3+2\sqrt{10}\right)}\right)\right)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+\frac{11\left(1+\sqrt{5}\right)\left(\sqrt{3+2\sqrt{10}}+\sqrt{7+2\sqrt{10}}\right)\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\sqrt{2}^{-s}}{8\sqrt{\pi}}$$

(((((x) (sqrt(1+sqrt2)) [(1/4(7+2sqrt10))^1/2+ (1/4(3+2sqrt10))^1/2]))) = 8.4269941500362

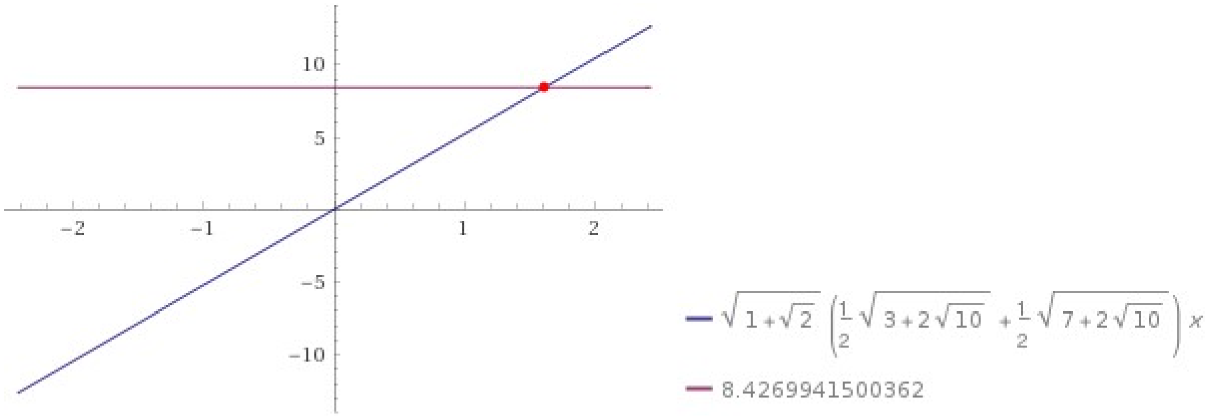
Input interpretation:

$$x\sqrt{1+\sqrt{2}}\left(\sqrt{\frac{1}{4}\left(7+2\sqrt{10}\right)}+\sqrt{\frac{1}{4}\left(3+2\sqrt{10}\right)}\right) = 8.4269941500362$$

Result:

$$\sqrt{1+\sqrt{2}}\left(\frac{1}{2}\sqrt{3+2\sqrt{10}}+\frac{1}{2}\sqrt{7+2\sqrt{10}}\right)x = 8.4269941500362$$

Plot:



Alternate forms:

$$\sqrt{1+\sqrt{2}}\left(\frac{1}{2}\left(\sqrt{2}+\sqrt{5}\right)+\frac{1}{2}\sqrt{3+2\sqrt{10}}\right)x = 8.4269941500362$$

$$\frac{1}{2}\sqrt{\left(1+\sqrt{2}\right)\left(7+2\sqrt{10}\right)}\,x+\frac{1}{2}\sqrt{\left(1+\sqrt{2}\right)\left(3+2\sqrt{10}\right)}\,x-8.4269941500362 = 0$$

$$x\sqrt{\left(\text{root of } x^8-20x^7-178x^6-400x^5-397x^4+400x^3-178x^2+20x+1 \text{ near } x = 27.125\right)} = 8.4269941500362$$

Solution:

$x \approx 1.618033988750$

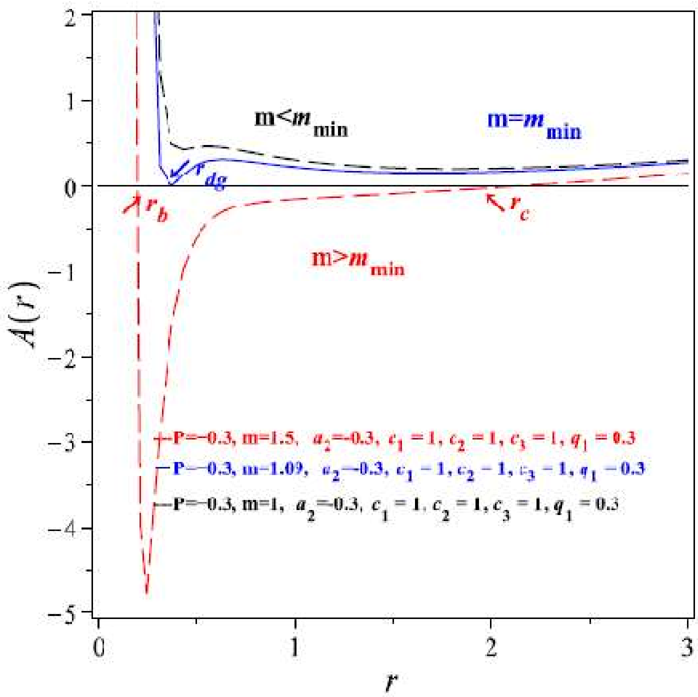
1.618033988750 = golden ratio

From:

Rotating and non-rotating AdS black holes in *f* (T) gravity non-linear electrodynamics - *Salvatore Capozziello, Gamal G.L. Nashed* - (Dated: October 22, 2019) - arXiv:1908.07381v2 [gr-qc] 19 Oct 2019

Now, we have that:

Here we take $d = 4$ and $a_1 = 1$.



(a) Possible horizons of the solution (33)

We take:

$P=-0.3,\ m=1.5,\ a_2=-0.3,\ c_1=1,\ c_2=1,\ c_3=1,\ q_1=0.3$

From

$$r_{dg} = \pm \frac{(6a_2P)^{1/6}\sqrt{(3q_1{}^2a_1 + 4m^2\sqrt{3P|a_2|} + q_1\sqrt{a_1}\sqrt{9a_1q_1{}^2 + 24m^2\sqrt{3P|a_2|}})^{3/2} - 2\sqrt{6}(m^4Pa_2)^{1/3}}}{\sqrt{a_1}m^{1/3}(3a_1q_1{}^2 + 4m^2\sqrt{3P|a_2|} + q_1\sqrt{a1}\sqrt{9a_1q_1{}^2 + 24m^2\sqrt{3P|a_2|}})^{1/6}},$$

(6(-0.3)(-0.3))^(1/6)*((((((((3*0.3^2+4*1.5^2*(3*0.3^2)^0.5+0.3*sqrt(9*0.3^2+24*1.5^2(3*0.3^2)^0.5)))^1.5-2sqrt6*(1.5^4*0.3^2)^(1/3)))))))^(1/2)

Input:

$$\sqrt[6]{6\times(-0.3)\times(-0.3)}\sqrt{\left(\left(3\times0.3^2+4\times1.5^2\sqrt{3\times0.3^2}+0.3\sqrt{9\times0.3^2+24\times1.5^2\sqrt{3\times0.3^2}}\right)^{1.5}-2\sqrt{6}\sqrt[3]{1.5^4\times0.3^2}\right)}$$

Result:

3.25691...

3.25691….

1.5^(1/3)((((3*0.3^2+4*1.5^2*sqrt(3*0.3^2)+0.3*
sqrt(9*0.3^2+24*1.5^2(3*0.3^2)^0.5))))^(1/6)

Input:

$$\sqrt[3]{1.5}\sqrt[6]{3\times0.3^2+4\times1.5^2\sqrt{3\times0.3^2}+0.3\sqrt{9\times0.3^2+24\times1.5^2\sqrt{3\times0.3^2}}}$$

Result:

1.56614...

1.56614...

We obtain:

3.25691 / (((((1.5^(1/3)((((3*0.3^2+4*1.5^2*sqrt(3*0.3^2)+0.3*
sqrt(9*0.3^2+24*1.5^2(3*0.3^2)^0.5)))))^(1/6))))))

Input interpretation:

$$\frac{3.25691}{\sqrt[3]{1.5}\ \sqrt[6]{3\times 0.3^2+4\times 1.5^2\sqrt{3\times 0.3^2}+0.3\sqrt{9\times 0.3^2+24\times 1.5^2\sqrt{3\times 0.3^2}}}}$$

Result:

2.07958...

2.07958… final result

From which:

4*11((((3.25691 / (((((1.5^(1/3)((((3*0.3^2+4*1.5^2*sqrt(3*0.3^2)+0.3* sqrt(9*0.3^2+24*1.5^2(3*0.3^2)^0.5)))))^(1/6))))))))))^5+18

Input interpretation:

$$4\times 11\left(\frac{3.25691}{\sqrt[3]{1.5}\ \sqrt[6]{3\times 0.3^2+4\times 1.5^2\sqrt{3\times 0.3^2}+0.3\sqrt{9\times 0.3^2+24\times 1.5^2\sqrt{3\times 0.3^2}}}}\right)^5+18$$

Result:

1729.31...

1729.31...

This result is very near to the mass of candidate glueball **f_0(1710) scalar 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) and:

[4*11((((3.25691 / (((((1.5^(1/3)((((3*0.3^2+4*1.5^2*sqrt(3*0.3^2)+0.3* sqrt(9*0.3^2+24*1.5^2(3*0.3^2)^0.5)))))^(1/6))))))))))^5+18]^1/15-(21+5)/10^3

Input interpretation:

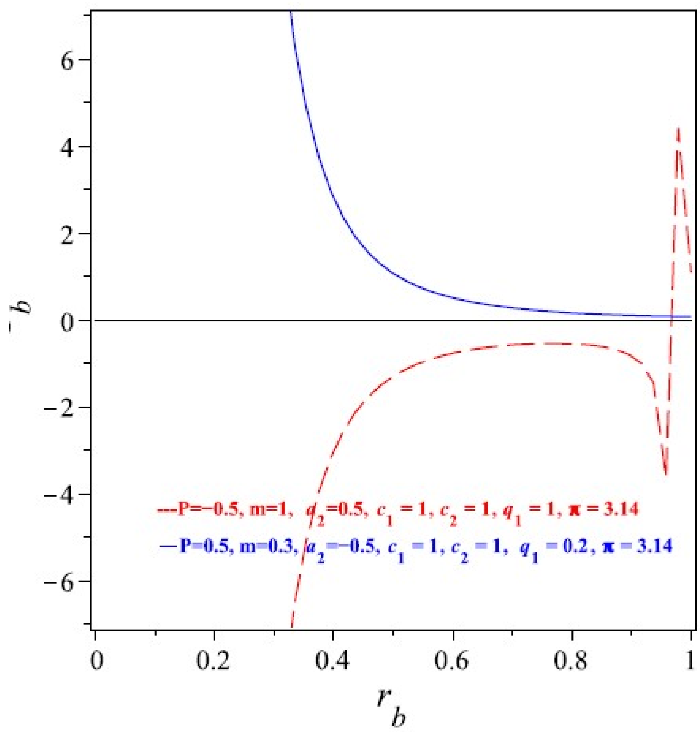
$$\left(4\times 11\left(3.25691\Big/\left(\sqrt[3]{1.5}\left(3\times 0.3^2+4\times 1.5^2\sqrt{3\times 0.3^2}+0.3\sqrt{9\times 0.3^2+24\times 1.5^2\sqrt{3\times 0.3^2}}\right)\text{^}(1/6)\right)\right)^5+18\right)\text{^}(1/15)-\frac{21+5}{10^3}$$

Result:

1.617834933143502063943917603506805664756539992924846974724...

1.6178349331435..... result that is a very good approximation to the value of the golden ratio 1.618033988749...

Then, we have that:



-P=−0.5, m=1, a_2=0.5, c_1 = 1, c_2 = 1, q_1 = 1, π = 3.14

-P=0.5, m=0.3, a_2=−0.5, c_1 = 1, c_2 = 1, q_1 = 0.2, π = 3.14

$$Q^2 = \frac{6(d-3)Pq^2}{a_1 c_1 (d-2)}, \quad Q_1{}^4 = -\frac{8(d-3)^2 P q^2 \sqrt{3P|a_2|}}{c_1 (d-2)(2d-5)} \text{ and}$$

$$Q_2{}^4 = -\frac{2Pq_1{}^2 q^2}{m^2 a_1 c_1 (d-2)(d-3)}.$$

$$q = -\frac{a_1}{3(d-2)(d-3)a_2 c_1 c_2},$$

We obtain:

-1/(3*2*1*(-0.5) = 0.3; q = 0.3

(6*0.5*0.3^2)/2 = 0.135 ; Q^2 = 0.135

-8*0.5*0.3^2*sqrt(3*0.5*(-0.5)) / (2*3) = 0.0519615; $Q_1{}^4$ = 0.0519615

-(2*0.5*0.2^2*0.3^2)/(0.3^2*2*1) = -0.020; $Q_2{}^4$ = -0.020

From:

$$G_{b_{Equation(33)}} = r_b{}^{d-3}\left(\Lambda_{eff} r_b{}^2 + \frac{Q^2}{r_b{}^{2(d-3)}} + \frac{Q_1{}^4}{r_b{}^{(3d-8)}} + \frac{Q_2{}^4}{r_b{}^{4(d-3)}} + \cdots\right) + \Omega_{d-2}\left(\frac{q^2 r_b{}^{d-1}(d-3)^2}{144(c-2)c_1\alpha} - \frac{q^2 r_b (d-3)^2\sqrt{3P|\alpha|}}{72(d-2)c_1\alpha} + \frac{P}{36(d-2)^3 c_1 r_b^{d-3}} + \frac{q^2\sqrt{3P|\alpha|}}{144m^2(d-2)r_b^{2d-7}c_1\alpha} - \frac{5(d-3)^2 Pq^2\sqrt{3P|\alpha|}}{6(d-2)r_b^{2b-5}c_1\alpha}\right). \tag{51}$$

$$r_b{}^{d-3}\left(\Lambda_{eff} r_b{}^2 + \frac{Q^2}{r_b{}^{2(d-3)}} + \frac{Q_1{}^4}{r_b{}^{(3d-8)}} + \frac{Q_2{}^4}{r_b{}^{4(d-3)}} + \cdots\right) +$$

$$+\,\Omega_{d-2}\Big(\frac{q^2 {r_b}^{d-1}(d-3)^2}{144(c-2)c_1\alpha} - \frac{q^2 r_b (d-3)^2\sqrt{3P|\alpha|}}{72(d-2)c_1\alpha}$$
$$+\frac{P}{36(d-2)^3 c_1 r_b^{d-3}} + \frac{q^2\sqrt{3P|\alpha|}}{144m^2(d-2)r_b^{2d-7}c_1\alpha} - \frac{5(d-3)^2 P q^2\sqrt{3P|\alpha|}}{6(d-2)r_b^{2b-5}c_1\alpha}\Big).$$

For:

$\Lambda_{eff} = 0.375$, $m = 0.3$, $r_b = 0.8$, $d = 4$, $P = 0.5$, $c_1 = 1$ $\Omega_{d-2} = 2\pi$, $b = 4$

$q = 0.3$, $Q^2 = 0.135$, $Q_1{}^4 = 0.0519615$, $Q_2{}^4 = -0.020$, $c = 1$, $\alpha = 1$

we obtain:

$${r_b}^{d-3}\left(\Lambda_{eff}{r_b}^2 + \frac{Q^2}{{r_b}^{2(d-3)}} + \frac{{Q_1}^4}{{r_b}^{(3d-8)}} + \frac{{Q_2}^4}{{r_b}^{4(d-3)}} + \cdots\right)$$

0.8*(0.375*0.8^2+0.135/0.8^2+0.0519615/0.8^4-0.020/0.8^4)

Input interpretation:

$$0.8\left(0.375\times 0.8^2 + \frac{0.135}{0.8^2} + \frac{0.0519615}{0.8^4} - \frac{0.02}{0.8^4}\right)$$

Result:

0.4231748046875

0.4231748046875

$$+\,\Omega_{d-2}\Big(\frac{q^2 {r_b}^{d-1}(d-3)^2}{144(c-2)c_1\alpha} - \frac{q^2 r_b (d-3)^2\sqrt{3P|\alpha|}}{72(d-2)c_1\alpha}$$
$$+\frac{P}{36(d-2)^3 c_1 r_b^{d-3}} + \frac{q^2\sqrt{3P|\alpha|}}{144m^2(d-2)r_b^{2d-7}c_1\alpha} - \frac{5(d-3)^2 P q^2\sqrt{3P|\alpha|}}{6(d-2)r_b^{2b-5}c_1\alpha}\Big).$$

2Pi((((((0.3^2*0.8^3)/(-144)-(((0.3^2)*0.8*sqrt(3*0.5)))/(72*2)+0.5/((36*8)*0.8)+(((0.3^2*sqrt(3*0.5)))/(((144*0.3^2*2*0.8)))-(5*0.5*0.3^2*sqrt(3*0.5))/(12*0.8^3)))))))

Input:

$$2\pi\left(-\frac{1}{144}\left(0.3^2\times 0.8^3\right)-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{(36\times 8)\times 0.8}+\left(\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)$$

Result:

$-0.240633\ldots$

-0.240633…

Series representations:

$$2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\left(\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)=0.00370028\,\pi-0.0655616\,\pi\sum_{k=0}^{\infty}\frac{(-0.5)^k\left(-\frac{1}{2}\right)_k}{k!}$$

$$2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\left(\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)=0.00370028\,\pi+\frac{0.0327808\,\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-j}e^{0.693147\,s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}$$

$$2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\left(\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)=0.00370028\,\pi-0.0655616\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(1.5-z_0)^k z_0^{-k}}{k!}$$

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

The final result is:

0.4231748046875+[2Pi((((((0.3^2*0.8^3)/(-144)-(((0.3^2)*0.8*sqrt(3*0.5)))/(72*2)+0.5/((36*8)*0.8)+(((0.3^2*sqrt(3*0.5)))/(((144*0.3^2*2*0.8)))-(5*0.5*0.3^2*sqrt(3*0.5))/(12*0.8^3)))))))]

Input interpretation:

$$0.4231748046875 + 2\pi\left(-\frac{1}{144}\left(0.3^2 \times 0.8^3\right) - \frac{0.3^2 \times 0.8\sqrt{3 \times 0.5}}{72 \times 2} + \frac{0.5}{(36 \times 8) \times 0.8} + \left(\frac{0.3^2\sqrt{3 \times 0.5}}{144 \times 0.3^2 \times 2 \times 0.8} - \frac{5 \times 0.5 \times 0.3^2\sqrt{3 \times 0.5}}{12 \times 0.8^3}\right)\right)$$

Result:

0.182541...

0.182541…

Series representations:

$$0.42317480468750000 + 2\pi\left(-\frac{1}{144} \times 0.3^2 \times 0.8^3 - \frac{0.3^2 \times 0.8\sqrt{3 \times 0.5}}{72 \times 2} + \frac{0.5}{0.8 \times 36 \times 8} + \left(\frac{0.3^2\sqrt{3 \times 0.5}}{144 \times 0.3^2 \times 2 \times 0.8} - \frac{5 \times 0.5 \times 0.3^2\sqrt{3 \times 0.5}}{12 \times 0.8^3}\right)\right) = 0.42317480468750000 + 0.00370028\pi - 0.0655616\pi\sum_{k=0}^{\infty}\frac{(-0.5)^k\left(-\frac{1}{2}\right)_k}{k!}$$

$$0.42317480468750000 + 2\pi\left(-\frac{1}{144} \times 0.3^2 \times 0.8^3 - \frac{0.3^2 \times 0.8\sqrt{3 \times 0.5}}{72 \times 2} + \frac{0.5}{0.8 \times 36 \times 8} + \left(\frac{0.3^2\sqrt{3 \times 0.5}}{144 \times 0.3^2 \times 2 \times 0.8} - \frac{5 \times 0.5 \times 0.3^2\sqrt{3 \times 0.5}}{12 \times 0.8^3}\right)\right) = 0.42317480468750000 + 0.00370028\pi + \frac{0.0327808\pi\sum_{j=0}^{\infty}\text{Res}_{s=-j}\, e^{0.693147s}\,\Gamma\left(-\frac{1}{2} - s\right)\Gamma(s)}{\sqrt{\pi}}$$

$$0.42317480468750000 + 2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3 - \frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2} + \frac{0.5}{0.8\times 36\times 8} + \left(\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8} - \frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right) =$$

$$0.42317480468750000 + 0.00370028\,\pi - 0.0655616\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (1.5 - z_0)^k z_0^{-k}}{k!}$$

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

From which:

1/ [0.4231748+[2Pi((((((0.3^2*0.8^3)/(-144)-(((0.3^2)*0.8*sqrt(3*0.5)))/(72*2)+0.5/((36*8)*0.8)+(0.3^2*sqrt(3*0.5))/(144*0.3^2*2*0.8)-(5*0.5*0.3^2*sqrt(3*0.5))/(12*0.8^3))))))]]^(e/(sqrt(3)ln(256)))

Input interpretation:

$$1\Bigg/\left(0.4231748 + 2\pi\left(-\frac{1}{144}(0.3^2\times 0.8^3) - \frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2} + \frac{0.5}{(36\times 8)\times 0.8} + \frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8} - \frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)^{e/(\sqrt{3}\log(256))}$$

log(x) is the natural logarithm

Result:

1.618266816477733157585875041772618331399898445058075969370...

1.618266816477….. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternative representations:

$$1\Big/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)^{e/\left(\sqrt{3}\log(256)\right)}=1\Big/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3+\frac{0.5}{230.4}-\frac{1}{144}\times 0.8\times 0.3^2\sqrt{1.5}+\frac{0.3^2\sqrt{1.5}}{230.4\times 0.3^2}-\frac{2.5\times 0.3^2\sqrt{1.5}}{12\times 0.8^3}\right)\right)^{e/\left(\log_e(256)\sqrt{3}\right)}$$

$$1\Big/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)^{e/\left(\sqrt{3}\log(256)\right)}=1\Big/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3+\frac{0.5}{230.4}-\frac{1}{144}\times 0.8\times 0.3^2\sqrt{1.5}+\frac{0.3^2\sqrt{1.5}}{230.4\times 0.3^2}-\frac{2.5\times 0.3^2\sqrt{1.5}}{12\times 0.8^3}\right)\right)^{e/\left(\log(a)\log_a(256)\sqrt{3}\right)}$$

$$1\Big/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)^{e/\left(\sqrt{3}\log(256)\right)}=1\Big/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3+\frac{0.5}{230.4}-\frac{1}{144}\times 0.8\times 0.3^2\sqrt{1.5}+\frac{0.3^2\sqrt{1.5}}{230.4\times 0.3^2}-\frac{2.5\times 0.3^2\sqrt{1.5}}{12\times 0.8^3}\right)\right)^{-e/\left(\mathrm{Li}_1(-255)\sqrt{3}\right)}$$

Series representations:

$$1 \Big/ \left(0.423175 + 2\pi \left(-\frac{1}{144} \times 0.3^2 \times 0.8^3 - \frac{0.3^2 \times 0.8 \sqrt{3 \times 0.5}}{72 \times 2} + \frac{0.5}{0.8 \times 36 \times 8} + \frac{0.3^2 \sqrt{3 \times 0.5}}{144 \times 0.3^2 \times 2 \times 0.8} - \frac{5 \times 0.5 \times 0.3^2 \sqrt{3 \times 0.5}}{12 \times 0.8^3}\right)\right)^{e/\left(\sqrt{3} \log(256)\right)} = \left(0.423175 + 0.00370028\,\pi - 0.0655616\,\pi \exp\left(i\pi \left\lfloor \frac{\arg(1.5 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (1.5 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)^{-e/\left(\exp\left(i\pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor\right) \log(256) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (3-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)}$$

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

$$1 \Big/ \left(0.423175 + 2\pi \left(-\frac{1}{144} \times 0.3^2 \times 0.8^3 - \frac{0.3^2 \times 0.8 \sqrt{3 \times 0.5}}{72 \times 2} + \frac{0.5}{0.8 \times 36 \times 8} + \frac{0.3^2 \sqrt{3 \times 0.5}}{144 \times 0.3^2 \times 2 \times 0.8} - \frac{5 \times 0.5 \times 0.3^2 \sqrt{3 \times 0.5}}{12 \times 0.8^3}\right)\right)^{e/\left(\sqrt{3} \log(256)\right)} = \left(0.423175 + 2\pi \left(0.00185014 - 0.0327808 \exp\left(i\pi \left\lfloor \frac{\arg(1.5 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (1.5 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{-e/\left(\exp\left(i\pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor\right) \sqrt{x} \left(\log(255) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{255}\right)^k}{k}\right) \sum_{k=0}^{\infty} \frac{(-1)^k (3-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)}$$

for

($x \in$

$\mathbb{R}$

and

$x < 0$)

$$1 \Big/ \left(0.423175 + 2\pi \left(-\frac{1}{144} \times 0.3^2 \times 0.8^3 - \frac{0.3^2 \times 0.8 \sqrt{3 \times 0.5}}{72 \times 2} + \frac{0.5}{0.8 \times 36 \times 8} + \frac{0.3^2 \sqrt{3 \times 0.5}}{144 \times 0.3^2 \times 2 \times 0.8} - \frac{5 \times 0.5 \times 0.3^2 \sqrt{3 \times 0.5}}{12 \times 0.8^3}\right)\right)^{e/\left(\sqrt{3} \log(256)\right)} = \left(0.423175 + 2\pi \left(0.00185014 - 0.0327808 \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(1.5 - z_0)/(2\pi) \rfloor} z_0^{1/2 + 1/2 \lfloor \arg(1.5 - z_0)/(2\pi) \rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (1.5 - z_0)^k z_0^{-k}}{k!}\right)\right)^{-\left(e \left(\frac{1}{z_0}\right)^{-1/2 \lfloor \arg(3 - z_0)/(2\pi) \rfloor} z_0^{-1/2 - 1/2 \lfloor \arg(3 - z_0)/(2\pi) \rfloor}\right) \Big/ \left(\log(256) \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3 - z_0)^k z_0^{-k}}{k!}\right)}$$

Integral representations:

$$1/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)^{e/\left(\sqrt{3}\log(256)\right)}=$$
$$\left(0.423175+\pi\left(0.00370028-0.0655616\sqrt{1.5}\right)\right)^{-e/\left(\sqrt{3}\int_1^{256}\frac{1}{t}dt\right)}$$

$$1/\left(0.423175+2\pi\left(-\frac{1}{144}\times 0.3^2\times 0.8^3-\frac{0.3^2\times 0.8\sqrt{3\times 0.5}}{72\times 2}+\frac{0.5}{0.8\times 36\times 8}+\frac{0.3^2\sqrt{3\times 0.5}}{144\times 0.3^2\times 2\times 0.8}-\frac{5\times 0.5\times 0.3^2\sqrt{3\times 0.5}}{12\times 0.8^3}\right)\right)^{e/\left(\sqrt{3}\log(256)\right)}=$$
$$\left(0.423175+\pi\left(0.00370028-0.0655616\sqrt{1.5}\right)\right)^{-(2ei\pi)/\left(\sqrt{3}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{255^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}ds\right)}\quad \text{for } -1<\gamma<0$$

Now, we have that:

$$\phi=-\frac{1}{3(d-2)(d-3)}.$$

-1/(3*2) = -1/6; ϕ = -1/6;

For:

$\phi = -1/6$; $P = -0.5$; $a_2 = -0.5$: $d = 4$; $r = 5$; $q_1 = 0.2$; $m = 1$

From:

$$\mathcal{E}(r)=\frac{\phi}{r^{d-3}}+\frac{6\phi^2(d-2)(d-3)^2\sqrt{3|a_2|P}}{a_1r^{(2d-5)}(2d-5)}+\frac{q_1{}^2\phi^2(2d-5)}{m^2r^{3(d-3)}(d-3)}+\cdots,$$

-(1/6)*(1/5) + (((6*1/36*2*(3*0.5^2)^(1/2))))/(((5^3*3)))+(0.2^2*1/36*3)/(5^3)

Input:

$$-\frac{1}{6}\times\frac{1}{5}+\frac{6\times\frac{1}{36}\times 2\sqrt{3\times 0.5^2}}{5^3\times 3}+\frac{0.2^2\times\frac{1}{36}\times 3}{5^3}$$

Result:

−0.032536866...

-0.032536866...

From which:

4/[-(((-(1/6)*(1/5) + (((6*1/36*2*(3*0.5^2)^(1/2))))/(((5^3*3)))+(0.2^2*1/36*3)/(5^3))))]+Pi-1/golden ratio

Input:

$$-\frac{4}{-\frac{1}{6}\times\frac{1}{5}+\frac{6\times\frac{1}{36}\times 2\sqrt{3\times 0.5^2}}{5^3\times 3}+\frac{0.2^2\times\frac{1}{36}\times 3}{5^3}}+\pi-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.46103...

125.46103… result very near to the Higgs boson mass 125.18 GeV

Series representations:

$$-\frac{4}{-\frac{1}{5\times 6}+\frac{6\left(2\sqrt{3\times 0.5^2}\right)}{(5^3\times 3)36}+\frac{0.2^2\times 3}{5^3\times 36}}+\pi-\frac{1}{\phi}=122.937-\frac{1}{\phi}+4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$-\frac{4}{-\frac{1}{5\times 6}+\frac{6\left(2\sqrt{3\times 0.5^2}\right)}{(5^3\times 3)36}+\frac{0.2^2\times 3}{5^3\times 36}}+\pi-\frac{1}{\phi}=120.937-\frac{1}{\phi}+2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$-\frac{4}{-\frac{1}{5\times 6}+\frac{6\left(2\sqrt{3\times 0.5^2}\right)}{(5^3\times 3)36}+\frac{0.2^2\times 3}{5^3\times 36}}+\pi-\frac{1}{\phi}=122.937-\frac{1}{\phi}+\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$-\frac{4}{-\frac{1}{5\times 6}+\frac{6\left(2\sqrt{3\times 0.5^2}\right)}{(5^3\times 3)36}+\frac{0.2^2\times 3}{5^3\times 36}}+\pi-\frac{1}{\phi}=122.937-\frac{1}{\phi}+2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$-\frac{4}{-\frac{1}{5\times 6}+\frac{6\left(2\sqrt{3\times 0.5^2}\right)}{(5^3\times 3)36}+\frac{0.2^2\times 3}{5^3\times 36}}+\pi-\frac{1}{\phi}=122.937-\frac{1}{\phi}+4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$-\frac{4}{-\frac{1}{5\times 6}+\frac{6\left(2\sqrt{3\times 0.5^2}\right)}{(5^3\times 3)36}+\frac{0.2^2\times 3}{5^3\times 36}}+\pi-\frac{1}{\phi}=122.937-\frac{1}{\phi}+2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

4/[-(((-(1/6)*(1/5) + (((6*1/36*2*(3*0.5^2)^(1/2))))/(((5^3*3))+(0.2^2*1/36*3)/(5^3))))]+18-golden ratio

Input:

$$-\frac{4}{-\frac{1}{6}\times\frac{1}{5}+\frac{6\times\frac{1}{36}\times 2\sqrt{3\times 0.5^2}}{5^3\times 3}+\frac{0.2^2\times\frac{1}{36}\times 3}{5^3}}+18-\phi$$

ϕ is the golden ratio

Result:

139.31944...

139.31944... result practically equal to the rest mass of Pion meson 139.57 MeV

27*1/2(((4/[-(((-(1/6)*(1/5) + (((6*1/36*2*(3*0.5^2)^(1/2))))/(((5^3*3)))+(0.2^2*1/36*3)/(5^3))))]+7-golden ratio)))-Pi

Input:

$$27\times\frac{1}{2}\left(-\frac{4}{-\frac{1}{6}\times\frac{1}{5}+\frac{6\times\frac{1}{36}\times 2\sqrt{3\times 0.5^2}}{5^3\times 3}+\frac{0.2^2\times\frac{1}{36}\times 3}{5^3}}+7-\phi\right)-\pi$$

ϕ is the golden ratio

Result:

1729.1708...

1729.1708…

This result is very near to the mass of candidate glueball **f_0(1710) scalar 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)

With regard 27 (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".*

Series representations:

$$\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi=1754.16-13.5\,\phi-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi = 1756.16-13.5\,\phi-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi =$$
$$1754.16-13.5\,\phi-\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi = 1754.16-13.5\,\phi-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi = 1754.16-13.5\,\phi-4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi = 1754.16-13.5\,\phi-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

(((27*1/2(((4/[-(((-(1/6)*(1/5) + (((6*1/36*2*(3*0.5^2)^(1/2))))/(((5^3*3)))+(0.2^2*1/36*3)/(5^3))))]+7-golden ratio)))-Pi)))^1/15-(21+5)1/10^3

Input:

$$\sqrt[15]{27\times\frac{1}{2}\left(-\frac{4}{-\frac{1}{6}\times\frac{1}{5}+\frac{6\times\frac{1}{36}\times 2\sqrt{3\times 0.5^2}}{5^3\times 3}+\frac{0.2^2\times\frac{1}{36}\times 3}{5^3}}+7-\phi\right)-\pi}-(21+5)\times\frac{1}{10^3}$$

ϕ is the golden ratio

Result:

1.61782605...

1.61782605…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Series representations:

$$\sqrt[15]{\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3}\times 0.5^2}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi}-\frac{21+5}{10^3}=$$

$$-0.026+1.18948\sqrt[15]{129.937-\phi-0.296296\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}$$

$$\sqrt[15]{\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3}\times 0.5^2}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi}-\frac{21+5}{10^3}=$$

$$-\frac{13}{500}+\sqrt[15]{1756.16-13.5\,\phi-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}}$$

$$\sqrt[15]{\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3}\times 0.5^2}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi}-\frac{21+5}{10^3}=$$

$$-0.026+1.18948\sqrt[15]{129.937-\phi-0.0740741\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\sqrt[15]{\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3}\times 0.5^2}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi}-\frac{21+5}{10^3}=$$

$$-\frac{13}{500}+\sqrt[15]{1754.16-13.5\,\phi-2\int_0^{\infty}\frac{1}{1+t^2}\,dt}$$

$$\sqrt[15]{\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi}-\frac{21+5}{10^3}=$$
$$-\frac{13}{500}+\sqrt[15]{1754.16-13.5\,\phi-4\int_0^1\sqrt{1-t^2}\,dt}$$

$$\sqrt[15]{\frac{27}{2}\left(-\frac{4}{-\frac{1}{6\times 5}+\frac{6\times 2\sqrt{3\times 0.5^2}}{36(5^3\times 3)}+\frac{0.2^2\times 3}{36\times 5^3}}+7-\phi\right)-\pi}-\frac{21+5}{10^3}=$$
$$-\frac{13}{500}+\sqrt[15]{1754.16-13.5\,\phi-2\int_0^\infty\frac{\sin(t)}{t}\,dt}$$

From:

https://twitter.com/aarvee18/status/679179049160208384

$$\frac{\pi^2}{6}-3\ln\left(\frac{\sqrt{5}+1}{2}\right)^2=\sum_{k=0}^{\infty}\frac{(-1)^k\,(k!)^2}{(2k)!(2k+1)^2}=$$

$$1-\frac{1}{2!\cdot 3^2}+\frac{(2!)^2}{4!\cdot 5^2}-\frac{(3!)^2}{6!\cdot 7^2}+\frac{(4!)^2}{8!\cdot 9^2}\ldots$$

(Pi^2)/6-3ln((sqrt5+1)/2)^2 = 1-(1/(2!3^2)+(2!)^2/(4!5^2)- (3!)^2/(6!7^2)+(4!)^2/(8!9^2)

(Pi^2)/6-3ln((sqrt5+1)/2)^2

Input:

$$\frac{\pi^2}{6}-3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right)$$

$\log(x)$ is the natural logarithm

Decimal approximation:

0.9502396051166432589816279529514269091697308510589018252 89...

0.950239605…. 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:

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

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

Alternate forms:

$$\frac{\pi^2}{6}-3\,\text{csch}^{-1}(2)^2$$

$$\frac{1}{6}\left(\pi^2 - 18\log^2\left(\frac{1}{2}\left(1+\sqrt{5}\right)\right)\right)$$

$$\frac{1}{6}\left(\pi^2 - 18\left(\log\left(1+\sqrt{5}\right) - \log(2)\right)^2\right)$$

$\text{csch}^{-1}(x)$ is the inverse hyperbolic cosecant function

Alternative representations:

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\log_e^2\left(\frac{1}{2}\left(1+\sqrt{5}\right)\right)$$

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\left(\log(a)\log_a\left(\frac{1}{2}\left(1+\sqrt{5}\right)\right)\right)^2$$

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\left(-\text{Li}_1\left(1+\frac{1}{2}\left(-1-\sqrt{5}\right)\right)\right)^2$$

Series representations:

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\left(\sum_{k=1}^{\infty}\frac{\left(\frac{1}{2}\left(1-\sqrt{5}\right)\right)^k}{k}\right)^2$$

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\left(2i\pi\left\lfloor\frac{\arg\left(1+\sqrt{5}-2x\right)}{2\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(1+\sqrt{5}-2x\right)^k x^{-k}}{k}\right)^2 \quad \text{for } x<0$$

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\left(2i\pi\left\lfloor\frac{\arg\left(\frac{1}{2}\left(1+\sqrt{5}\right)-x\right)}{2\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(1+\sqrt{5}-2x\right)^k x^{-k}}{k}\right)^2 \quad \text{for } x<0$$

Integral representations:

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} - 3\left(\int_1^{\frac{1}{2}\left(1+\sqrt{5}\right)}\frac{1}{t}\,dt\right)^2$$

$$\frac{\pi^2}{6} - 3\log^2\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right) = \frac{\pi^2}{6} + \frac{3\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\frac{1}{2}\left(1+\sqrt{5}\right)\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{4\pi^2} \quad \text{for } -1<\gamma<0$$

and:

1-1/(2!3^2)+(2!)^2/(4!5^2)- (3!)^2/(6!7^2)+ (4!)^2/(8!9^2)

Input:

$$1 - \frac{1}{2! \times 3^2} + \frac{(2!)^2}{4! \times 5^2} - \frac{(3!)^2}{6! \times 7^2} + \frac{(4!)^2}{8! \times 9^2}$$

$n!$ is the factorial function

Exact result:

$$\frac{377161}{396900}$$

Decimal approximation:

0.95026706979087931468883849836230788611740992693373645754 5...

0.95026706979…. as above

Alternative representations:

$$1 - \frac{1}{2! \times 3^2} + \frac{(2!)^2}{4! \times 5^2} - \frac{(3!)^2}{6! \times 7^2} + \frac{(4!)^2}{8! \times 9^2} = 1 - \frac{1}{9\,\Gamma(3)} + \frac{\Gamma(3)^2}{\Gamma(5)\,5^2} - \frac{\Gamma(4)^2}{\Gamma(7)\,7^2} + \frac{\Gamma(5)^2}{\Gamma(9)\,9^2}$$

$$1 - \frac{1}{2! \times 3^2} + \frac{(2!)^2}{4! \times 5^2} - \frac{(3!)^2}{6! \times 7^2} + \frac{(4!)^2}{8! \times 9^2} = 1 - \frac{1}{9 \times 1!! \times 2!!} + \frac{(1!! \times 2!!)^2}{3!! \times 4!! \times 5^2} - \frac{(2!! \times 3!!)^2}{5!! \times 6!! \times 7^2} + \frac{(3!! \times 4!!)^2}{7!! \times 8!! \times 9^2}$$

$$1 - \frac{1}{2! \times 3^2} + \frac{(2!)^2}{4! \times 5^2} - \frac{(3!)^2}{6! \times 7^2} + \frac{(4!)^2}{8! \times 9^2} = 1 - \frac{1}{9\,\Gamma(3, 0)} + \frac{\Gamma(3, 0)^2}{\Gamma(5, 0)\,5^2} - \frac{\Gamma(4, 0)^2}{\Gamma(7, 0)\,7^2} + \frac{\Gamma(5, 0)^2}{\Gamma(9, 0)\,9^2}$$

Series representation:

$$1-\frac{1}{2!\times 3^2}+\frac{(2!)^2}{4!\times 5^2}-\frac{(3!)^2}{6!\times 7^2}+\frac{(4!)^2}{8!\times 9^2}=\left(1225\left(\sum_{k=0}^{\infty}\frac{(4-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)^3 \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(2-n_0)^{k_1}\,(6-n_0)^{k_2}\,\Gamma^{(k_1)}(1+n_0)\,\Gamma^{(k_2)}(1+n_0)}{k_1!\,k_2!}+ 3969\left(\sum_{k=0}^{\infty}\frac{(2-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)^3 \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(6-n_0)^{k_1}\,(8-n_0)^{k_2}\,\Gamma^{(k_1)}(1+n_0)\,\Gamma^{(k_2)}(1+n_0)}{k_1!\,k_2!}- 2025\left(\sum_{k=0}^{\infty}\frac{(3-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)^2 \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(2-n_0)^{k_1}\,(4-n_0)^{k_2}\,(8-n_0)^{k_3}\,\Gamma^{(k_1)}(1+n_0)\,\Gamma^{(k_2)}(1+n_0)\,\Gamma^{(k_3)}(1+n_0)}{k_1!\,k_2!\,k_3!} - 11\,025\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(4-n_0)^{k_1}\,(6-n_0)^{k_2}\,(8-n_0)^{k_3}\,\Gamma^{(k_1)}(1+n_0)\,\Gamma^{(k_2)}(1+n_0)\,\Gamma^{(k_3)}(1+n_0)}{k_1!\,k_2!\,k_3!} + 99\,225\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\sum_{k_4=0}^{\infty}\frac{1}{k_1!\,k_2!\,k_3!\,k_4!}(2-n_0)^{k_1}\,(4-n_0)^{k_2}\,(6-n_0)^{k_3}\,(8-n_0)^{k_4}\,\Gamma^{(k_1)}(1+n_0)\,\Gamma^{(k_2)}(1+n_0)\,\Gamma^{(k_3)}(1+n_0)\,\Gamma^{(k_4)}(1+n_0)\right)\Big/ \left(99\,225\left(\sum_{k=0}^{\infty}\frac{(2-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\left(\sum_{k=0}^{\infty}\frac{(4-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right) \left(\sum_{k=0}^{\infty}\frac{(6-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)$$

for $((n_0 \geq 0 \text{ or } n_0 \notin \mathbb{Z}) \text{ and } n_0 \to 2 \text{ and } n_0 \to 3 \text{ and } n_0 \to 4 \text{ and } n_0 \to 6 \text{ and } n_0 \to 8)$

Integral representations:

$$1-\frac{1}{2!\times 3^2}+\frac{(2!)^2}{4!\times 5^2}-\frac{(3!)^2}{6!\times 7^2}+\frac{(4!)^2}{8!\times 9^2}= \left(\int_0^1\int_0^1\log^2\left(\frac{1}{t_1}\right)\log^6\left(\frac{1}{t_2}\right)dt_2\,dt_1+\int_0^1\int_0^1\log^6\left(\frac{1}{t_1}\right)\log^8\left(\frac{1}{t_2}\right)dt_2\,dt_1+ \int_0^1\int_0^1\int_0^1\log^2\left(\frac{1}{t_1}\right)\log^4\left(\frac{1}{t_2}\right)\log^8\left(\frac{1}{t_3}\right)dt_3\,dt_2\,dt_1+ \int_0^1\int_0^1\int_0^1\log^4\left(\frac{1}{t_1}\right)\log^6\left(\frac{1}{t_2}\right)\log^8\left(\frac{1}{t_3}\right)dt_3\,dt_2\,dt_1+ \int_0^1\int_0^1\int_0^1\int_0^1\log^2\left(\frac{1}{t_1}\right)\log^4\left(\frac{1}{t_2}\right)\log^6\left(\frac{1}{t_3}\right)\log^8\left(\frac{1}{t_4}\right)dt_4\,dt_3\,dt_2\,dt_1\right)\Big/ \left(99\,225\left(\int_0^1\log^2\left(\frac{1}{t}\right)dt\right)\left(\int_0^1\log^4\left(\frac{1}{t}\right)dt\right)\left(\int_0^1\log^6\left(\frac{1}{t}\right)dt\right)\int_0^1\log^8\left(\frac{1}{t}\right)dt\right)$$

$$1-\frac{1}{2!\times 3^2}+\frac{(2!)^2}{4!\times 5^2}-\frac{(3!)^2}{6!\times 7^2}+\frac{(4!)^2}{8!\times 9^2}=$$
$$\Big(1225\left(\int_0^\infty e^{-t}t^2\,dt\right)\left(\int_0^\infty e^{-t}t^4\,dt\right)^3\int_0^\infty e^{-t}t^6\,dt-2025\left(\int_0^\infty e^{-t}t^2\,dt\right)\left(\int_0^\infty e^{-t}t^3\,dt\right)^2\left(\int_0^\infty e^{-t}t^4\,dt\right)\int_0^\infty e^{-t}t^8\,dt+3969\left(\int_0^\infty e^{-t}t^2\,dt\right)^3\left(\int_0^\infty e^{-t}t^6\,dt\right)\int_0^\infty e^{-t}t^8\,dt-11025\left(\int_0^\infty e^{-t}t^4\,dt\right)\left(\int_0^\infty e^{-t}t^6\,dt\right)\int_0^\infty e^{-t}t^8\,dt+99225\left(\int_0^\infty e^{-t}t^2\,dt\right)\left(\int_0^\infty e^{-t}t^4\,dt\right)\left(\int_0^\infty e^{-t}t^6\,dt\right)\int_0^\infty e^{-t}t^8\,dt\Big)\Big/\Big(99225\left(\int_0^\infty e^{-t}t^2\,dt\right)\left(\int_0^\infty e^{-t}t^4\,dt\right)\left(\int_0^\infty e^{-t}t^6\,dt\right)\int_0^\infty e^{-t}t^8\,dt\Big)$$

$$1-\frac{1}{2!\times 3^2}+\frac{(2!)^2}{4!\times 5^2}-\frac{(3!)^2}{6!\times 7^2}+\frac{(4!)^2}{8!\times 9^2}=$$
$$1-\frac{1}{9\left(\int_1^\infty e^{-t}t^2\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(3+k)k!}\right)}+\frac{\left(\int_1^\infty e^{-t}t^2\,dt\right)^2}{25\left(\int_1^\infty e^{-t}t^4\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(5+k)k!}\right)}+\frac{2\sum_{k=0}^\infty\frac{(-1)^k}{(3+k)k!}\int_1^\infty e^{-t}t^2\,dt}{25\left(\int_1^\infty e^{-t}t^4\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(5+k)k!}\right)}+\frac{\left(\sum_{k=0}^\infty\frac{(-1)^k}{(3+k)k!}\right)^2}{25\left(\int_1^\infty e^{-t}t^4\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(5+k)k!}\right)}-\frac{\left(\int_1^\infty e^{-t}t^3\,dt\right)^2}{49\left(\int_1^\infty e^{-t}t^6\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(7+k)k!}\right)}-\frac{2\sum_{k=0}^\infty\frac{(-1)^k}{(4+k)k!}\int_1^\infty e^{-t}t^3\,dt}{49\left(\int_1^\infty e^{-t}t^6\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(7+k)k!}\right)}-\frac{\left(\sum_{k=0}^\infty\frac{(-1)^k}{(4+k)k!}\right)^2}{49\left(\int_1^\infty e^{-t}t^6\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(7+k)k!}\right)}+\frac{\left(\int_1^\infty e^{-t}t^4\,dt\right)^2}{81\left(\int_1^\infty e^{-t}t^8\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(9+k)k!}\right)}+\frac{2\sum_{k=0}^\infty\frac{(-1)^k}{(5+k)k!}\int_1^\infty e^{-t}t^4\,dt}{81\left(\int_1^\infty e^{-t}t^8\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(9+k)k!}\right)}+\frac{\left(\sum_{k=0}^\infty\frac{(-1)^k}{(5+k)k!}\right)^2}{81\left(\int_1^\infty e^{-t}t^8\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(9+k)k!}\right)}$$

(Pi^2)/6-3ln(x)^2 = 0.95023960511664

Input interpretation:

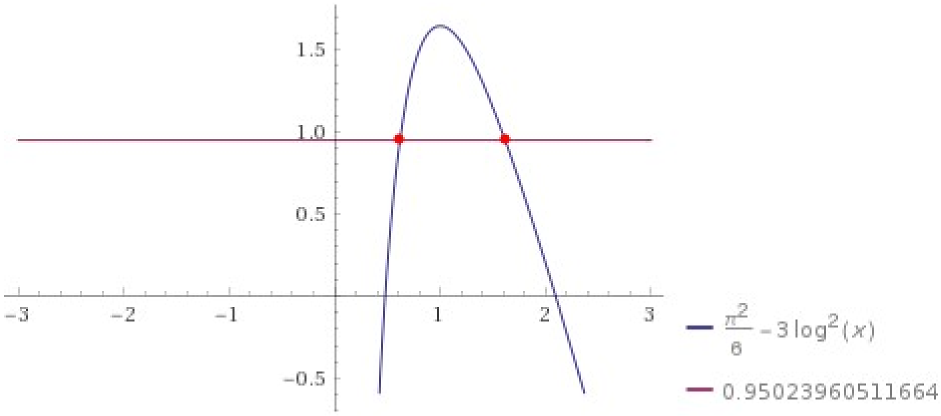
$$\frac{\pi^2}{6}-3\log^2(x)=0.95023960511664$$

log(x) is the natural logarithm

Result:

$$\frac{\pi^2}{6}-3\log^2(x)=0.95023960511664$$

Plot:



Alternate form:

$\frac{1}{6}(\pi^2 - 18\log^2(x)) = 0.95023960511664$

Alternate form assuming x is positive:

$1.0000000000000\log^2(x) = 0.23156482057720$

Solutions:

$x \approx 0.61803398874989\,42$

0.6180339887498942

$x \approx 1.6180339887498965$

1.6180339887498965

Observations

Figs.

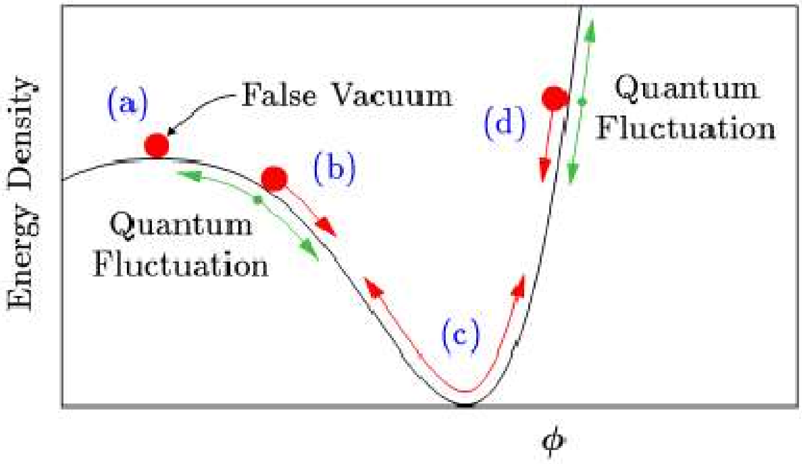
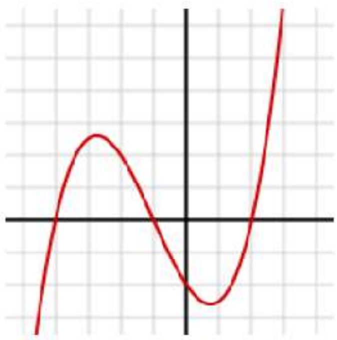


FIG. 1: In simple inflationary models, the universe at early times is dominated by the potential energy density of a scalar field, ϕ. Red arrows show the classical motion of ϕ. When ϕ is near region (a), the energy density will remain nearly constant, $\rho \cong \rho_f$, even as the universe expands. Moreover, cosmic expansion acts like a frictional drag, slowing the motion of ϕ: Even near regions (b) and (d), ϕ behaves more like a marble moving in a bowl of molasses, slowly creeping down the side of its potential, rather than like a marble sliding down the inside of a polished bowl. During this period of "slow roll," ρ remains nearly constant. Only after ϕ has slid most of the way down its potential will it begin to oscillate around its minimum, as in region (c), ending inflation.



Graph of a cubic function with 3 real roots (where the curve crosses the horizontal axis at $y = 0$). The case shown has two critical points. Here the function is $f(x) = (x^3 + 3x^2 - 6x - 8)/4$.

The ratio between M_0 and q

$$M_0 = \sqrt{3q^2 - \Sigma^2},$$

$$q = \frac{(3\sqrt{3})\, M_s}{2}.$$

i.e. the gravitating mass M_0 and the Wheelerian mass q of the wormhole, is equal to:

$$\frac{\sqrt{3\,(2.17049\times 10^{37})^2 - 0.001^2}}{\frac{1}{2}\left((3\sqrt{3})\,(4.2\times 10^6\times 1.9891\times 10^{30})\right)}$$

1.7320507879051944207039476256710181600835665488020824605 20...

1.7320507879

$1.7320507879 \approx \sqrt{3}$ that is the ratio between the gravitating mass M_0 and the Wheelerian mass q of the wormhole

We note that:

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

i is the imaginary unit

$$i\sqrt{3}$$

1.7320508075688772935274463415058723669428052538103806280 55... i

$r \approx 1.73205$ (radius), $\theta = 90°$ (angle)

1.73205

This result is very near to the ratio between M_0 and q, that is equal to 1.7320507879 $\approx \sqrt{3}$

With regard $\sqrt{3}$, we note that is a fundamental value of the formula structure that we need to calculate a Cubic Equation

We have that the previous result

$\left(-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)-\left(-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right) = i\sqrt{3} =$

$= 1.7320508075688772935274463415058723669428052538103806280558... i$

$r \approx 1.73205$ (radius), $\theta = 90°$ (angle)

can be related with:

$$u^2(-u)\left(\frac{1}{2}\pm\frac{i\sqrt{3}}{2}\right)+v^2(-v)\left(\frac{1}{2}\pm\frac{i\sqrt{3}}{2}\right)=q$$

Considering:

$$(-1)\left(\frac{1}{2}-\frac{i\sqrt{3}}{2}\right)-(-1)\left(\frac{1}{2}+\frac{i\sqrt{3}}{2}\right)=q$$

$= i\sqrt{3} = 1.7320508075688772935274463415058723669428052538103806280558... i$

$r \approx 1.73205$ (radius), $\theta = 90°$ (angle)

Thence:

$\left(-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)-\left(-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right) \Rightarrow$

$$\Rightarrow (-1)\left(\frac{1}{2}-\frac{i\sqrt{3}}{2}\right)-(-1)\left(\frac{1}{2}+\frac{i\sqrt{3}}{2}\right)=q=1.73205\approx\sqrt{3}$$

We observe how the graph above, concerning the cubic function, is very similar to the graph that represent the scalar field (in red). It is possible to hypothesize that cubic functions and cubic equations, with their roots, are connected to the scalar field.

From:
https://www.scientificamerican.com/article/mathematics-ramanujan/?fbclid=IwAR2caRXrn_RpOSvJ1QxWsVLBcJ6KVgd_Af_hrmDYBNyU8mpSjRs1BDeremA

Ramanujan's statement concerned the deceptively simple concept of partitions—the different ways in which a whole number can be subdivided into smaller numbers. Ramanujan's original statement, in fact, stemmed from the observation of patterns, such as the fact that p(9) = 30, p(9 + 5) = 135, p(9 + 10) = 490, p(9 + 15) = 1,575 and so on are all divisible by 5. Note that here the n's come at intervals of five units.

Ramanujan posited that this pattern should go on forever, and that similar patterns exist when 5 is replaced by 7 or 11—there are infinite sequences of p(n) that are all divisible by 7 or 11, or, as mathematicians say, in which the "moduli" are 7 or 11.

Then, in nearly oracular tone Ramanujan went on: "There appear to be corresponding properties," he wrote in his 1919 paper, "in which the moduli are powers of 5, 7 or 11...and no simple properties for any moduli involving primes other than these three." (Primes are whole numbers that are only divisible by themselves or by 1.) Thus, for instance, there should be formulas for an infinity of n's separated by 5^3 = 125 units, saying that the corresponding p(n)'s should all be divisible by 125. In the past methods developed to understand partitions have later been applied to physics problems such as the theory of the strong nuclear force or the entropy of black holes.

From Wikipedia

In particle physics, Yukawa's interaction or Yukawa coupling, named after Hideki Yukawa, is an interaction between a scalar field ϕ and a Dirac field ψ. The Yukawa interaction can be used to describe the nuclear force between nucleons (which are fermions), mediated by pions (which are pseudoscalar mesons). The Yukawa interaction is also used in the Standard Model to describe the coupling between the Higgs field and massless quark and lepton fields (i.e., the fundamental fermion particles). Through spontaneous symmetry breaking, these fermions acquire a mass proportional to the vacuum expectation value of the Higgs field.

Can be this the motivation that from the development of the Ramanujan's equations we obtain results 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 practically equal to the rest mass of Pion meson 139.57 MeV

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.

In mathematics, the Fibonacci numbers, commonly denoted F_n, form a sequence, called the Fibonacci sequence, such that each number is the sum of the two preceding ones, starting from 0 and 1. Fibonacci numbers are strongly related to the golden ratio: Binet's formula expresses the nth Fibonacci number in terms of n and the golden ratio, and implies that the ratio of two consecutive Fibonacci numbers tends to the golden ratio as n increases.
Fibonacci numbers are also closely related to Lucas numbers ,in that the Fibonacci and Lucas numbers form a complementary pair of Lucas sequences

The beginning of the sequence is thus:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269, 2178309, 3524578, 5702887, 9227465, 14930352, 24157817, 39088169, 63245986, 102334155...

The Lucas numbers or Lucas series are an integer sequence named after the mathematician François Édouard Anatole Lucas (1842–91), who studied both that sequence and the closely related Fibonacci numbers. Lucas numbers and Fibonacci numbers form complementary instances of Lucas sequences.

The Lucas sequence has the same recursive relationship as the Fibonacci sequence, where each term is the sum of the two previous terms, but with different starting values. This produces a sequence where the ratios of successive terms approach the golden ratio, and in fact the terms themselves are roundings of integer powers of the golden ratio.[1] The sequence also has a variety of relationships with the Fibonacci numbers, like the fact that adding any two Fibonacci numbers two terms apart in the Fibonacci sequence results in the Lucas number in between.

The sequence of Lucas numbers is:

2, 1, 3, 4, 7, 11, 18, 29, 47, 76, 123, 199, 322, 521, 843, 1364, 2207, 3571, 5778, 9349, 15127, 24476, 39603, 64079, 103682, 167761, 271443, 439204, 710647, 1149851, 1860498, 3010349, 4870847, 7881196, 12752043, 20633239, 33385282, 54018521, 87403803……

All Fibonacci-like integer sequences appear in shifted form as a row of the Wythoff array; the Fibonacci sequence itself is the first row and the Lucas sequence is the second row. Also like all Fibonacci-like integer sequences, the ratio between two consecutive Lucas numbers converges to the golden ratio.

A Lucas prime is a Lucas number that is prime. The first few Lucas primes are:

2, 3, 7, 11, 29, 47, 199, 521, 2207, 3571, 9349, 3010349, 54018521, 370248451, 6643838879, ... (sequence A005479 in the OEIS).

In geometry, a golden spiral is a logarithmic spiral whose growth factor is φ, the golden ratio.[1] That is, a golden spiral gets wider (or further from its origin) by a factor of φ for every quarter turn it makes. Approximate logarithmic spirals can occur in nature, for example the arms of spiral galaxies[3] - golden spirals are one special case of these logarithmic spirals

We note how the following three values: 137.508 (golden angle), 139.57 (mass of the Pion - meson Pi) and 125.18 (mass of the Higgs boson), are connected to each other. In fact, just add 2 to 137.508 to obtain a result very close to the mass of the Pion and subtract 12 to 137.508 to obtain a result that is also very close to the mass of the Higgs boson. We can therefore hypothesize that it is the golden angle (and the related golden ratio inherent in it) to be a fundamental ingredient both in the structures of the microcosm and in those of the macrocosm.

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