On the possible mathematical connections between several Ramanujan equations concerning p(n) and τ(n), some equations concerning the *SO(N)* group in Bosonic String Theory, various parameters regarding Particle Physics and ζ(2). VIII

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Abstract

In this paper (part VIII), we describe and analyze further new mathematical connections between some Ramanujan formulas concerning p(n) and τ(n), several equations concerning the SO(N) group, for N = 8192, in Bosonic String Theory, various parameters regarding Particle Physics and ζ(2).

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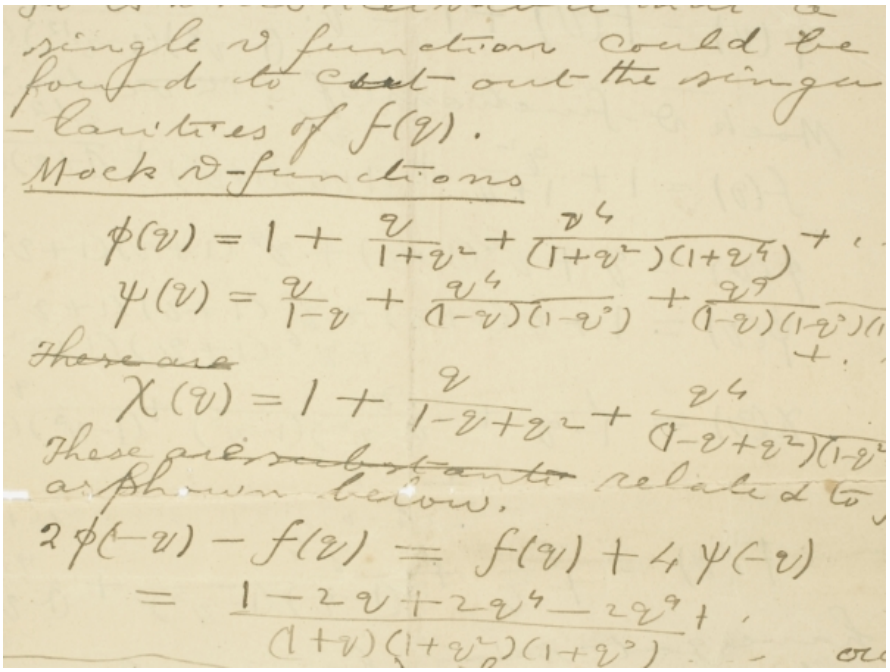


https://royalsociety.org/science-events-and-lectures/2018/10/srinivasa-ramanujan/



https://www.sapaviva.com/srinivasa-ramanujan-2/

From:

https://web.archive.org/web/20020207051215/http://anduin.eldar.org/~problemi/singmast/ecmutil.html

THE UNREASONABLE UTILITY OF RECREATIONAL MATHEMATICS
by Prof. David Singmaster

WHY IS RECREATIONAL MATHEMATICS SO USEFUL?

"As I said earlier, I have only a tentative answer to this, but it also partly answers Wigner's question. Mathematics has been described as a search for pattern - and that certainly describes much of what we do and also much of what most scientists do. But how do we find patterns? The real world is messy and patterns are difficult to see. As we begin to see a pattern, we tend to remove all the inessential details and get to an ideal or model situation. These models may be so removed from reality that they become fanciful or even recreational. E.g. physicists deal with frictionless perfectly elastic particles, weightless strings, ideal gases, etc. Then such models get modified and adapted into a large variety of models. Now one of the ways in which a science progresses is by seeing analogies between reality and simpler situations. E.g. the idea of the circulation of the blood could not be developed until the idea of a pump was known and somewhat understood. The behaviour of a real system cannot be developed until one can see simpler models within it. But what are these simpler models? They are generally among the large variety of models which have been created in the past, often recreational or fanciful. Perhaps the clearest example is graph theory, where Euler made a simple model of the reality that he was studying, then later workers found that model useful in other situations. Thus recreational mathematics helps as a major source of mathematical models, which are the raw material for mathematical research"

We, in our papers, through the use of "recreational number theory", obtain possible new matematical connections between various sectors of Ramanujan's mathematics and various physical parameters concerning several topics of physics and cosmology.

From:

THE GEOMETRY OF OPEN STRING PARTITION FUNCTIONS
Massimo Bianchi and Augusto Sagnotti - Dipartimento di Fisica - Università di Roma II, "Tor Vergata" - Via Orazio Raimondo - 00173 Roma ITALY - ROM.lF-88/40 and I. N. F. N. - Sezione d.i Roma , ITALY

The partition function of the SO(N) bosonic string, apart from the term of eq. (2.25), rescaled by a factor two, is

$$Z_{tot} = -\frac{N}{2}\left(\frac{T}{2\pi}\right)^{13}\int_0^1 \frac{dq}{2\pi q}\frac{1}{\eta(-q)^{24}} + \frac{N^2+2^{26}}{4\ 2^{13}}\left(\frac{T}{2\pi}\right)^{13}\int_0^1 \frac{dq}{2\pi q}\frac{1}{\eta(q)^{24}}\ , \qquad (3.3)$$

We know that (from Wikipedia):

For any complex number τ with $\mathbf{Im}(\tau) > 0$, let $q = e^{2\pi i\tau}$, then the eta function is defined by,

$$\eta(\tau) = e^{\frac{\pi i\tau}{12}}\prod_{n=1}^{\infty}(1-e^{2n\pi i\tau}) = q^{\frac{1}{24}}\prod_{n=1}^{\infty}(1-q^n).$$

The notation $q \equiv e^{2\pi i\tau}$ is now standard in number theory, though many older books use q for the nome $e^{\pi i\tau}$. Raising the eta equation to the 24th power and multiplying by $(2\pi)^{12}$ gives

$$\Delta(\tau) = (2\pi)^{12}\eta^{24}(\tau)$$

where Δ is the modular discriminant. The presence of 24 can be understood by connection with other occurrences, such as in the 24-dimensional Leech lattice.

Thence, we have:

[1/(2Pi)*1/-((((535.49165)))^1/24*((1-535.49165^2))) + (12^2+2^26)/(4*2^13) * (((1/(2Pi*0.9568666373)*(1/(2Pi)))))^13]

Input interpretation:

$$\frac{1}{2\pi}\left(-\frac{1}{\sqrt[24]{535.49165}\ (1-535.49165^2)}\right) + \frac{12^2+2^{26}}{4\times 2^{13}}\left(\frac{1}{2\pi\times 0.9568666373}\times\frac{1}{2\pi}\right)^{13}$$

Result:

$4.2718718\ldots \times 10^{-7}$

$4.2718718\ldots*10^{-7}$

Alternative representations:

$$-\frac{1}{\left(\sqrt[24]{535.492}\ \left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{1}{(360^\circ)\left(-\left(1-535.492^2\right)\sqrt[24]{535.492}\right)}+\frac{\left(2^{26}+12^2\right)\left(\frac{1}{(344.472^\circ)(360^\circ)}\right)^{13}}{4\times 2^{13}}$$

$$-\frac{1}{\left(\sqrt[24]{535.492}\ \left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{1}{\left(2\cos^{-1}(-1)\right)\left(-\left(1-535.492^2\right)\sqrt[24]{535.492}\right)}+\frac{\left(2^{26}+12^2\right)\left(\frac{1}{\left(1.91373\cos^{-1}(-1)\right)\left(2\cos^{-1}(-1)\right)}\right)^{13}}{4\times 2^{13}}$$

$$-\frac{1}{\left(\sqrt[24]{535.492}\ \left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{1}{(4\,E(0))\left(-\left(1-535.492^2\right)\sqrt[24]{535.492}\right)}+\frac{\left(2^{26}+12^2\right)\left(\frac{1}{(3.82747\,E(0))(4\,E(0))}\right)^{13}}{4\times 2^{13}}$$

Series representations:

$$-\frac{1}{\left(\sqrt[24]{535.492}\ \left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{2.11738\times 10^{-36}\left(5.67707\times 10^{15}+1.58456\times 10^{29}\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2\,k}\right)^{25}\right)}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2\,k}\right)^{26}}$$

$$-\frac{1}{\left(\sqrt[24]{535.492}\ \left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{8.06683\times 10^{-13}}{\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2\,k}{k}}\right)^{26}}+\frac{6.71024\times 10^{-7}}{-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2\,k}{k}}}$$

$$-\frac{1}{\left(\sqrt[24]{535.492}\,\left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{0.0000541356}{\left(x+2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}\right)^{26}}+\frac{1.34205\times 10^{-6}}{x+2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}}\quad \text{for } (x\in\mathbb{R} \text{ and } x>0)$$

Integral representations:

$$-\frac{1}{\left(\sqrt[24]{535.492}\,\left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{1.42095\times 10^{-28}\left(5.67707\times 10^{15}+4.72237\times 10^{21}\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^{25}\right)}{\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^{26}}$$

$$-\frac{1}{\left(\sqrt[24]{535.492}\,\left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{1.42095\times 10^{-28}\left(5.67707\times 10^{15}+4.72237\times 10^{21}\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^{25}\right)}{\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^{26}}$$

$$-\frac{1}{\left(\sqrt[24]{535.492}\,\left(1-535.492^2\right)\right)(2\,\pi)}+\frac{\left(\frac{1}{(2\,\pi\,0.956867)(2\,\pi)}\right)^{13}\left(12^2+2^{26}\right)}{4\times 2^{13}}=$$
$$\frac{2.11738\times 10^{-36}\left(5.67707\times 10^{15}+1.58456\times 10^{29}\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^{25}\right)}{\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^{26}}$$

We note also that:

[1/(2Pi)*1/-((((535.49165)))^1/24*((1-535.49165^2))) + (12^2+x^2)/(4*2^13) * (((1/(2Pi*0.9568666373)*(1/(2Pi)))))^13] = 4.27187179561761265281926741684799693349424840187 × 10^-7

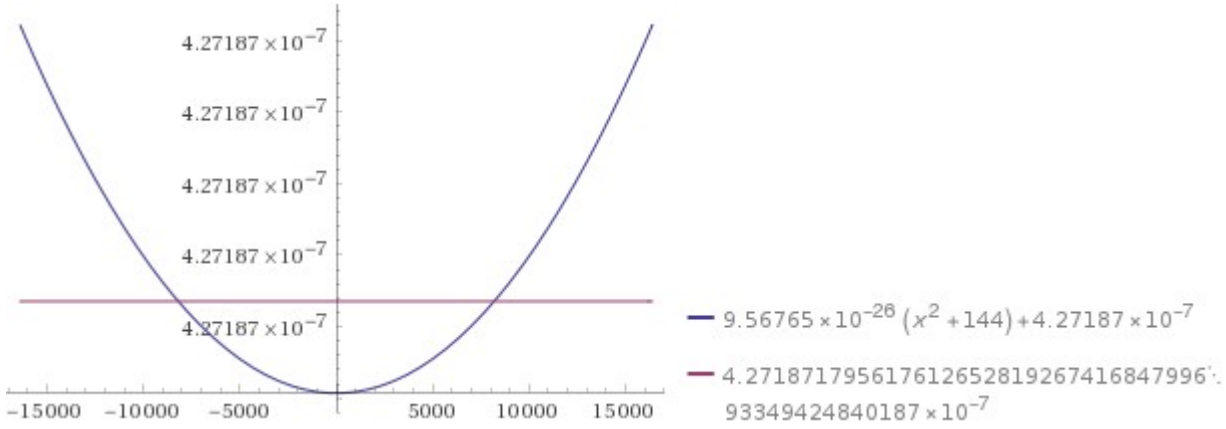
Input interpretation:

$$\frac{1}{2\pi}\left(-\frac{1}{\sqrt[24]{535.49165}\,(1-535.49165^2)}\right)+\frac{12^2+x^2}{4\times 2^{13}}\left(\frac{1}{2\pi\times 0.9568666373}\times\frac{1}{2\pi}\right)^{13}=$$
$$4.27187179561761265281926741684799693349424840187\times 10^{-7}$$

Result:

$$9.56765\times 10^{-26}\,(x^2+144)+4.27187\times 10^{-7}=$$
$$4.27187179561761265281926741684799693349424840187\times 10^{-7}$$

Plot:



Alternate forms:

$$9.56765\times 10^{-26}\,x^2-6.42076\times 10^{-18}=0$$

$$9.56765\times 10^{-26}\,x^2+4.27187\times 10^{-7}=$$
$$4.27187179561761265281926741684799693349424840187\times 10^{-7}$$

Solutions:

$x\approx -8192.02$

$x\approx 8192.02$

About equal to 8192

The result of the above expression

$$\frac{1}{2\pi}\left(-\frac{1}{\sqrt[24]{535.49165}\,(1-535.49165^2)}\right)+\frac{12^2+2^{26}}{4\times 2^{13}}\left(\frac{1}{2\pi\times 0.9568666373}\times\frac{1}{2\pi}\right)^{13}$$

is:

$4.2718718\ldots\times 10^{-7}$

Now:

-12/2 * (((1/(2Pi*0.9568666373)*(1/(2Pi))))^13 * integrate (4.2718718 × 10^-7)x, from 0 to 1

We have that:

Input interpretation:

$$-\frac{12}{2}\left(\frac{1}{2\pi\times 0.9568666373}\times\frac{1}{2\pi}\right)^{13}$$

Result:

$-1.88107586\ldots\times 10^{-20}$

-1.88107586…*10^-20

Alternative representations:

$$\frac{1}{2}\left(\frac{1}{(2\pi\,0.956867)\,(2\pi)}\right)^{13}(-12)=-6\left(\frac{1}{(344.472^\circ)\,(360^\circ)}\right)^{13}$$

$$\frac{1}{2}\left(\frac{1}{(2\pi\,0.956867)\,(2\pi)}\right)^{13}(-12)=-6\left(\frac{1}{(1.91373\cos^{-1}(-1))\,(2\cos^{-1}(-1))}\right)^{13}$$

$$\frac{1}{2}\left(\frac{1}{(2\pi\,0.956867)\,(2\pi)}\right)^{13}(-12)=-6\left(\frac{1}{(3.82747\,E(0))\,(4\,E(0))}\right)^{13}$$

Series representations:

$$\frac{1}{2}\left(\frac{1}{(2\,\pi\,0.956867)\,(2\,\pi)}\right)^{13}(-12) = -\frac{3.52163\times10^{-23}}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2\,k}\right)^{26}}$$

$$\frac{1}{2}\left(\frac{1}{(2\,\pi\,0.956867)\,(2\,\pi)}\right)^{13}(-12) = -\frac{2.36332\times10^{-15}}{\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2\,k}{k}}\right)^{26}}$$

$$\frac{1}{2}\left(\frac{1}{(2\,\pi\,0.956867)\,(2\,\pi)}\right)^{13}(-12) = -\frac{1.586\times10^{-7}}{\left(\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50\,k)}{\binom{3\,k}{k}}\right)^{26}}$$

Integral representations:

$$\frac{1}{2}\left(\frac{1}{(2\,\pi\,0.956867)\,(2\,\pi)}\right)^{13}(-12) = -\frac{2.36332\times10^{-15}}{\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^{26}}$$

$$\frac{1}{2}\left(\frac{1}{(2\,\pi\,0.956867)\,(2\,\pi)}\right)^{13}(-12) = -\frac{3.52163\times10^{-23}}{\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^{26}}$$

$$\frac{1}{2}\left(\frac{1}{(2\,\pi\,0.956867)\,(2\,\pi)}\right)^{13}(-12) = -\frac{2.36332\times10^{-15}}{\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^{26}}$$

The result is:

$-1.88107586\ldots\times10^{-20}$

-1.88107586…*10^{-20}

Thence:

Definite integral:

$$-1.88108\times10^{-20}\int_0^{1}4.27187\times10^{-7}\,x\,dx = -4.01786\times10^{-27}$$

And again:

-4.01786×10^-27 integrate [1/(2Pi)*1/((((535.49165)))^1/24*((1-535.49165^2)))]x, from 0 to 1

Definite integral:

$$-4.01786\times10^{-27}\int_0^1 -4.27187\times10^{-7}\,x\,dx = 8.58189\times10^{-34}$$

$8.58189 * 10^{-34}$

Now, we have that:

((2^(1/3)*1/7))^1/3

Input:

$$\sqrt[3]{\sqrt[3]{2}\times\frac{1}{7}}$$

Result:

$$\frac{\sqrt[9]{2}}{\sqrt[3]{7}}$$

Decimal approximation:

0.564609824242076521913479904983520768625412828330269435146...

0.564609824…

Alternate form:

$$\frac{1}{7}\left(\sqrt[9]{2}\;7^{2/3}\right)$$

From which:

8.58189×10^-34 * ((2^(1/3)*1/7))^1/3

Input interpretation:

$$8.58189 \times 10^{-34} \sqrt[3]{\sqrt[3]{2} \times \frac{1}{7}}$$

Result:

$4.84542... \times 10^{-34}$

4.84542…*10^{-34} result practically equal to the value of the Planck electrical resistivity 4.845411×10^{-34} Ω·m

Indeed:

$$Z_{\mathrm{P}}^{\rho} = Z_{\mathrm{P}} l_{\mathrm{P}} = t_{\mathrm{P}} k_{\mathrm{e}} = \sqrt{\frac{\hbar G}{16\pi^2 \epsilon_0^2 c^5}}$$

sqrt((1.054571817e-34*6.6743e-11)/(16Pi^2*(8.85418781762e-12)^2*299792458^5))

$$\sqrt{\frac{1.054571817 \times 10^{-34} \times 6.6743 \times 10^{-11}}{16\,\pi^2\,(8.85418781762 \times 10^{-12})^2 \times 299\,792\,458^5}}$$

$4.84541... \times 10^{-34}$

4.84541…*10^{-34}

From

$$\sqrt[3]{\sqrt[3]{2} \times \frac{1}{7}}$$

$$\frac{\sqrt[9]{2}}{\sqrt[3]{7}}$$

0.56460982424207652191347990498352076862541282833026943514 6...

We obtain also:

2*((((2^(1/3)*1/7))^1/3))^1/3

Input:

$$2\sqrt[3]{\sqrt[3]{\sqrt[3]{2}\times\frac{1}{7}}}$$

Result:

$$\frac{2\sqrt[27]{2}}{\sqrt[9]{7}}$$

Decimal approximation:

1.653025193128011476568126531954571902951287449033657477144...

1.6530251931…. result very near to the 14th root of the following Ramanujan's class invariant $Q = \left(G_{505}/G_{101/5}\right)^3$ = 1164.2696 i.e. 1.65578...

Alternate form:

$$\frac{2}{7}\left(\sqrt[27]{2}\ 7^{8/9}\right)$$

We note that, from the result we obtain also:

1/(8.58189 * 10^-34)

Input interpretation:

$$\frac{1}{\frac{8.58189}{10^{34}}}$$

Result:

$1.165244485771782206483653367731350553316344068730780 7... \times 10^{33}$

$1.165244485771782206483653367731350553316344068730780 7 \times 10^{33}$

and

p(1100)= 1147240591519695580043346988281283; the ratio between the two values is

(116524448577178220648365336773135 0 /
114724059151969558004334698828128 3)

Input:

$$\frac{1\,165\,244\,485\,771\,782\,206\,483\,653\,367\,731\,350}{1\,147\,240\,591\,519\,695\,580\,043\,346\,988\,281\,283}$$

Exact result:

$$\frac{89\,634\,191\,213\,214\,015\,883\,357\,951\,363\,950}{88\,249\,276\,270\,745\,813\,849\,488\,229\,867\,791}$$

Decimal approximation:

1.015693215865242107283906176765086984897950238523688554275...

1.015693215…

From which:

[1/(116524448577178220648365336773135 0 /
114724059151969558004334698828128 3)]^1/16

Input:

$$\sqrt[16]{\frac{1}{\frac{1\,165\,244\,485\,771\,782\,206\,483\,653\,367\,731\,350}{1\,147\,240\,591\,519\,695\,580\,043\,346\,988\,281\,283}}}$$

Result:

$$\frac{\sqrt[16]{\frac{88\,249\,276\,270\,745\,813\,849\,488\,229\,867\,791}{132\,791\,394\,389\,946\,690\,197\,567\,335\,354}}}{3^{3/16}\sqrt[8]{5}}$$

Decimal approximation:

0.999027263997770147931326940764248030274561988654709482703...

0.9990272639… result practically equal to the value of the following Rogers-Ramanujan continued fraction:

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

And to the following expression:

sin(Pi(exp(-2/3)))

Input:

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

Exact result:

$$\sin\left(\frac{\pi}{e^{2/3}}\right)$$

Decimal approximation:

0.999111772954774587402048904921966770616888241097043944748...

0.999111772954….

Reference triangle for angle 1.613 radians:



width	$\cos\left(\frac{\pi}{e^{2/3}}\right)\approx -0.0421386$
height	$\sin\left(\frac{\pi}{e^{2/3}}\right)\approx 0.999112$

Alternate form:

$$\frac{1}{2}\,i\,e^{-(i\,\pi)/e^{2/3}}-\frac{1}{2}\,i\,e^{(i\,\pi)/e^{2/3}}$$

Alternative representations:

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = \cos\left(\frac{\pi}{2} - \pi \exp\left(-\frac{2}{3}\right)\right)$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = -\cos\left(\frac{\pi}{2} + \pi \exp\left(-\frac{2}{3}\right)\right)$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = \frac{-e^{-i\,(\pi \exp(-2/3))} + e^{i\,\pi \exp(-2/3)}}{2\,i}$$

Series representations:

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = \sum_{k=0}^{\infty} \frac{(-1)^k\, e^{-2/3\,(1+2\,k)}\, \pi^{1+2\,k}}{(1+2\,k)!}$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = 2 \sum_{k=0}^{\infty} (-1)^k\, J_{1+2\,k}\left(\frac{\pi}{e^{2/3}}\right)$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = \sum_{k=0}^{\infty} \frac{(-1)^k \left(\left(-\frac{1}{2} + \frac{1}{e^{2/3}}\right)\pi\right)^{2\,k}}{(2\,k)!}$$

$n!$ is the factorial function

$J_n(z)$ is the Bessel function of the first kind

Integral representations:

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = \frac{\pi}{e^{2/3}} \int_0^1 \cos\left(\frac{\pi\, t}{e^{2/3}}\right) dt$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = -\frac{i\,\sqrt{\pi}}{4\,e^{2/3}} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-\pi^2 / \left(4\,e^{4/3}\,s\right)+s}}{s^{3/2}}\, ds \quad \text{for } \gamma > 0$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = -\frac{i}{2\,\sqrt{\pi}} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-2/3\,(1-2\,s)} \left(\frac{\pi}{2}\right)^{1-2\,s} \Gamma(s)}{\Gamma\left(\frac{3}{2} - s\right)}\, ds \quad \text{for } 0 < \gamma < 1$$

Multiple-argument formulas:

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = -\frac{1}{2} i \left(\sqrt[e^{2/3}]{-1} + (-1)^{1+1/e^{2/3}} e^{-(2 i \pi)/e^{2/3}}\right)$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = 2 \cos\left(\frac{\pi}{2 e^{2/3}}\right) \sin\left(\frac{\pi}{2 e^{2/3}}\right)$$

$$\sin\left(\pi \exp\left(-\frac{2}{3}\right)\right) = 3 \sin\left(\frac{\pi}{3 e^{2/3}}\right) - 4 \sin^3\left(\frac{\pi}{3 e^{2/3}}\right)$$

Alternate forms:

$$\left(\sqrt[16]{88\,249\,276\,270\,745\,813\,849\,488\,229\,867\,791}\right.$$
$$\left. 3^{13/16} \times 5^{7/8} \times 132\,791\,394\,389\,946\,690\,197\,567\,335\,354^{15/16}\right) /$$
$$1\,991\,870\,915\,849\,200\,352\,963\,510\,030\,310$$

$$\text{root of } 89\,634\,191\,213\,214\,015\,883\,357\,951\,363\,950\,x^{16} - 88\,249\,276\,270\,745\,813\,849\,488\,229\,867\,791 \text{ near } x = 0.999027$$

We have also:

[(116524448577178220648365336773135 0 / 114724059151969558004334698828128 3)]^32

Input:

$$\left(\frac{1\,165\,244\,485\,771\,782\,206\,483\,653\,367\,731\,350}{1\,147\,240\,591\,519\,695\,580\,043\,346\,988\,281\,283}\right)^{32}$$

Decimal approximation:

1.64589320968502041248863498473010793436639755914555668778 1...

$1.645893209\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Or, we have:

colog(8.58189 * 10^-34)

Result:

76.138239...

76.138239…. result very near to the value of p(12) = 77

Alternative representations:

$$-\log\left(\frac{8.58189}{10^{34}}\right) = -\log_e\left(\frac{8.58189}{10^{34}}\right)$$

$$-\log\left(\frac{8.58189}{10^{34}}\right) = -\log(a)\log_a\left(\frac{8.58189}{10^{34}}\right)$$

$$-\log\left(\frac{8.58189}{10^{34}}\right) = \left(\mathrm{Li}_1\left(1-\frac{8.58189}{10^{34}}\right) = \mathrm{Li}_1(1)\right)$$

Series representations:

$$-\log\left(\frac{8.58189}{10^{34}}\right) = -2\,i\,\pi\left\lfloor\frac{\arg(8.58189\times10^{-34}-x)}{2\,\pi}\right\rfloor - \log(x) + \sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-x)^k\,x^{-k}}{k} \quad \text{for } x<0$$

$$-\log\left(\frac{8.58189}{10^{34}}\right) = -\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) - \log(z_0) - \left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\,\pi}\right\rfloor\log(z_0) + \sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

$$-\log\left(\frac{8.58189}{10^{34}}\right) = -2\,i\,\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{8.58189\times10^{-34}}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor - \log(z_0) + \sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

Integral representation:

$$-\log\left(\frac{8.58189}{10^{34}}\right) = -\int_1^{8.58189\times10^{-34}} \frac{1}{t}\,dt$$

Furthermore:

23*colog(8.58189 * 10^-34)-29+7

Input interpretation:

$$23\left(-\log\left(\frac{8.58189}{10^{34}}\right)\right) - 29 + 7$$

$\log(x)$ is the natural logarithm

Result:

1729.1795...

1729.1795…

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. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

Alternative representations:

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right) - 29 + 7 = -22 - 23\log_e\left(\frac{8.58189}{10^{34}}\right)$$

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right) - 29 + 7 = -22 - 23\log(a)\log_a\left(\frac{8.58189}{10^{34}}\right)$$

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right) - 29 + 7 = \left(-22 + 23\,\mathrm{Li}_1\left(1 - \frac{8.58189}{10^{34}}\right) = -22 + 23\,\mathrm{Li}_1(1)\right)$$

Series representations:

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+7=-22-46\,i\,\pi\left\lfloor\frac{\arg(8.58189\times10^{-34}-x)}{2\,\pi}\right\rfloor-23\log(x)+23\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-x)^k\,x^{-k}}{k}\quad\text{for } x<0$$

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+7=-22-23\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-23\log(z_0)-23\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\,\pi}\right\rfloor\log(z_0)+23\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+7=-22-46\,i\,\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{8.58189\times10^{-34}}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor-23\log(z_0)+23\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

Integral representation:

$$23\,(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+7=-22-23\int_1^{8.58189\times10^{-34}}\frac{1}{t}\,dt$$

2colog(8.58189 * 10^-34)-13

Input interpretation:

$$2\left(-\log\left(\frac{8.58189}{10^{34}}\right)\right)-13$$

$\log(x)$ is the natural logarithm

Result:

139.27648...

139.27648… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=-13-2\log_e\left(\frac{8.58189}{10^{34}}\right)$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=-13-2\log(a)\log_a\left(\frac{8.58189}{10^{34}}\right)$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=\left(-13+2\,\mathrm{Li}_1\left(1-\frac{8.58189}{10^{34}}\right)=-13+2\,\mathrm{Li}_1(1)\right)$$

Series representations:

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=-13-4i\pi\left\lfloor\frac{\arg(8.58189\times10^{-34}-x)}{2\pi}\right\rfloor-2\log(x)+2\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-x)^k\,x^{-k}}{k}\quad\text{for } x<0$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=-13-2\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-2\log(z_0)-2\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\pi}\right\rfloor\log(z_0)+2\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=-13-4i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{8.58189\times10^{-34}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor-2\log(z_0)+2\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

Integral representation:

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-13=-13-2\int_1^{8.58189\times10^{-34}}\frac{1}{t}\,dt$$

2colog(8.58189 * 10^-34)-29+2

Input interpretation:

$$2\left(-\log\left(\frac{8.58189}{10^{34}}\right)\right)-29+2$$

$\log(x)$ is the natural logarithm

Result:

125.27648...

125.27648… result very near to the Higgs boson mass 125.18 GeV

Alternative representations:

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=-27-2\log_e\left(\frac{8.58189}{10^{34}}\right)$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=-27-2\log(a)\log_a\left(\frac{8.58189}{10^{34}}\right)$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=\left(-27+2\,\mathrm{Li}_1\left(1-\frac{8.58189}{10^{34}}\right)=-27+2\,\mathrm{Li}_1(1)\right)$$

Series representations:

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=-27-4i\pi\left\lfloor\frac{\arg(8.58189\times10^{-34}-x)}{2\pi}\right\rfloor-2\log(x)+2\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-x)^k\,x^{-k}}{k}\quad\text{for } x<0$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=$$
$$-27-2\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-2\log(z_0)-$$
$$2\left\lfloor\frac{\arg(8.58189\times10^{-34}-z_0)}{2\pi}\right\rfloor\log(z_0)+2\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=-27-4i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{8.58189\times10^{-34}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor-$$
$$2\log(z_0)+2\sum_{k=1}^{\infty}\frac{(-1)^k\,(8.58189\times10^{-34}-z_0)^k\,z_0^{-k}}{k}$$

Integral representation:

$$2(-1)\log\left(\frac{8.58189}{10^{34}}\right)-29+2=-27-2\int_1^{8.58189\times10^{-34}}\frac{1}{t}\,dt$$

(((23*colog(8.58189 * 10^-34)-29+7)))^1/15

Input interpretation:

$$\sqrt[15]{23\left(-\log\left(\frac{8.58189}{10^{34}}\right)\right)-29+7}$$

$\log(x)$ is the natural logarithm

Result:

1.64382661...

$1.64382661\ldots\approx\zeta(2)=\frac{\pi^2}{6}=1.644934\ldots$

Now, we have that:

The factorization of the partition function in the open-string channels gives

$$Z_{(\chi=-1)} \to \sum N^B \frac{2^{14}}{(2\pi)^3} \int dp_1 dp_2 \int \frac{dt_1 dt_2}{|t_1|\,|t_2|} |t_1|^{p_1 t^2 - 1}\, |t_2|^{p_2 2^2 - 1} \int dx\, |1-x|^{-2}\, |x|^{2p_1 p_2} \quad (3.25)$$

From:

$$Z_{(\chi=-1)} \to \sum N^B \frac{2^{14}}{(2\pi)^3} \int dp_1 dp_2 \int \frac{dt_1 dt_2}{|t_1|\,|t_2|} |t_1|^{p_1 t^2 - 1}\, |t_2|^{p_2 2^2 - 1} \int dx\, |1-x|^{-2}\, |x|^{2p_1 p_2}$$

We obtain

(see "*On the possible mathematical connections between several Ramanujan equations concerning p(n) and τ(n), some equations concerning the Partition Function of the SO(8192) bosonic string, various parameters regarding Particle Physics, ϕ and ζ(2). VII – Michele Nardelli, Antonio Nardelli*")

12 * (2^14) / (((2Pi)^3)) * ((integrate (sqrt2*sqrt2)x)) * ((integrate (1/(0.61803398 * 1.61803398) * 0.61803398 *1.61803398)x)) * integrate ((1-((((((sqrt5)+5)/2))^-2))))(((sqrt5)+5)/2)^4 x

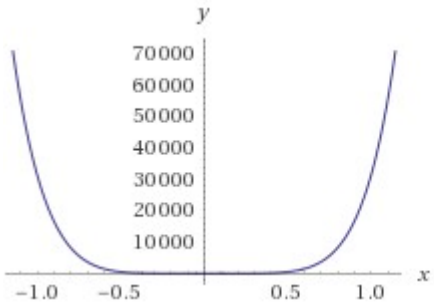
Input interpretation:

$$12 \times \frac{2^{14}}{(2\pi)^3} \left(\int \left(\sqrt{2}\ \sqrt{2}\right) x\, dx\right) \left(\int \left(\frac{1}{0.61803398 \times 1.61803398} \times 0.61803398 \times 1.61803398\right) x\, dx\right) \int \left(1 - \frac{1}{\left(\frac{1}{2}\left(\sqrt{5}+5\right)\right)^2}\right) \left(\frac{1}{2}\left(\sqrt{5}+5\right)\right)^4 x\, dx$$

Result:

$$396.307\, x^4 \left(\frac{1}{32}\left(5+\sqrt{5}\right)^4 x^2 - \frac{1}{8}\left(5+\sqrt{5}\right)^2 x^2\right)$$

Plot:



(x from −1.1 to 1.1)

Alternate forms:

$$396.307\,x^4\left(\frac{1}{4}\left(175+75\sqrt{5}\right)x^2+\frac{1}{4}\left(-15-5\sqrt{5}\right)x^2\right)$$

$$31\,360.2\,x^6$$

Alternate form assuming x>0:

$$31\,360.2\,x^6$$

Alternate form assuming x is real:

$$31\,360.2\,x^6+0$$

Indefinite integral assuming all variables are real:

$$4480.03\,x^7+\text{constant}$$

From

$$396.307\,x^4\left(\frac{1}{32}\left(5+\sqrt{5}\right)^4x^2-\frac{1}{8}\left(5+\sqrt{5}\right)^2x^2\right)$$

considering x = 1 , we obtain:

396.307 (-1/8 (5 + sqrt(5))^2 + 1/32 (5 + sqrt(5))^4)

Input interpretation:

$$396.307\left(-\frac{1}{8}\left(5+\sqrt{5}\right)^2+\frac{1}{32}\left(5+\sqrt{5}\right)^4\right)$$

Result:

31360.2...

31360.2…

From the Hardy-Ramanujan Asymptotic Partition Formula

(https://www.quora.com/Is-Ramanujan%E2%80%8Bs-formula-for-partitions%E2%80%8B-the-best-we-have)

An asymptotic expression for $p(n)$ is given by

$$p(n) \sim \frac{1}{4n\sqrt{3}} \exp\left(\pi\sqrt{\frac{2n}{3}}\right) \text{ as } n \to \infty.$$

we obtain, adding p(15) = 176:

1/8(((396.307 (-1/8 (5 + sqrt(5))^2 + 1/32 (5 + sqrt(5))^4)))) + 1/(4*15*sqrt(3)) * e^(2Pi * sqrt(15/6))-21-golden ratio

where we have subtracted 21, that is a Fibonacci number, and the golden ratio to obtain a very good approximation

Input interpretation:

$$\frac{1}{8}\left(396.307\left(-\frac{1}{8}\left(5+\sqrt{5}\right)^2+\frac{1}{32}\left(5+\sqrt{5}\right)^4\right)\right)+\frac{1}{4\times 15\sqrt{3}}e^{2\pi\sqrt{15/6}}-21-\phi$$

ϕ is the golden ratio

Result:

4095.94...

4095.94… ≈ 4096

Series representations:

$$\frac{1}{8}\times 396.307\left(-\frac{1}{8}\left(5+\sqrt{5}\right)^2+\frac{1}{32}\left(5+\sqrt{5}\right)^4\right)+\frac{e^{2\pi\sqrt{15/6}}}{4\times 15\sqrt{3}}-21-\phi=$$

$$-\frac{1}{\sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}}$$

$$\left(-0.0166667\,e^{2\pi\sqrt{3/2}\ \sum_{k=0}^{\infty}(3/2)^{-k}\binom{1/2}{k}}-791.739\sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}+\right.$$

$$\phi\sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}-226.019\sqrt{2}\ \sqrt{4}^2\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^2-$$

$$30.9615\sqrt{2}\ \sqrt{4}^3\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^3-$$

$$1.54807\sqrt{2}\ \sqrt{4}^4\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^4-$$

$$\left.712.114\sqrt{2}\ \sqrt{4}\ \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}2^{-k_1-2k_2}\binom{\frac{1}{2}}{k_1}\binom{\frac{1}{2}}{k_2}\right)$$

$$\frac{1}{8}\times 396.307\left(-\frac{1}{8}\left(5+\sqrt{5}\right)^2+\frac{1}{32}\left(5+\sqrt{5}\right)^4\right)+\frac{e^{2\pi\sqrt{15/6}}}{4\times 15\sqrt{3}}-21-\phi=$$

$$-\left(\left(-0.0166667\exp\left(2\pi\sqrt{\frac{3}{2}}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{2}{3}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)-\right.\right.$$

$$791.739\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}+\phi\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}-$$

$$226.019\sqrt{2}\ \sqrt{4}^2\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^2-$$

$$30.9615\sqrt{2}\ \sqrt{4}^3\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^3-$$

$$1.54807\sqrt{2}\ \sqrt{4}^4\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^4-712.114\sqrt{2}$$

$$\left.\left.\sqrt{4}\ \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1+k_2}\,2^{-k_1-2k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}}{k_1!\,k_2!}\right)\Big/\left(\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)$$

$$\frac{1}{8}\times 396.307\left(-\frac{1}{8}\left(5+\sqrt{5}\right)^2+\frac{1}{32}\left(5+\sqrt{5}\right)^4\right)+\frac{e^{2\pi\sqrt{15/6}}}{4\times 15\sqrt{3}}-21-\phi=$$
$$-\left(\left(-0.0166667\exp\left(2\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{5}{2}-z_0\right)^k z_0^{-k}}{k!}\right)-791.739\sqrt{z_0}\right.\right.$$
$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}+\phi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}-$$
$$226.019\sqrt{z_0}^3\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)$$
$$\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^2-30.9615\sqrt{z_0}^4$$
$$\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^3-$$
$$1.54807\sqrt{z_0}^5\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)$$
$$\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^4-712.114\sqrt{z_0}^2$$
$$\left.\left.\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1+k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}(3-z_0)^{k_1}(5-z_0)^{k_2}z_0^{-k_1-k_2}}{k_1!\,k_2!}\right)\right/$$
$$\left.\left(\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\right)$$
$$\text{for } \left(\text{not } \left(z_0\in\mathbb{R} \text{ and } -\infty < z_0 \le 0\right)\right)$$

From:

Volume 216, number 1,2 PHYSICS LETTERS B 5 January 1989 - **OPEN STRING ORBIFOLDS** - *Gianfranco PRADISI and Augusto SAGNOTTI* - Dipartimento di Fisica, Universith di Roma II, "'Tor Vergata', Via Orazio Raimondo, 1-00173 Rome, Italy and lNFN, Sezione di Roma, 1-00185 Rome, Italy - Received 11 August 1988

Now, we have that:

$$Z^{(a)}_{(DD,+)}+Z^{(k)}_{(+-)}+Z^{(m)}_{(+-)}=\frac{2^{13-n/2}}{4}\int_{-1}^{1}\frac{dq}{2\pi q}\left(\frac{-\log|q|}{2\pi}\right)^{-n/2}\frac{1}{\eta(q)^{24}},$$

$$\left[\tfrac{1}{8}\,\mathrm{Tr}(\mathbb{1}_D)^2 \int_0^\infty \frac{d\tau}{\tau^{14-n/2}} \frac{2^n \sum_\Lambda \exp(-\pi\tau w^2/\alpha') + 2^n(2^n-1)\sum_{\Lambda'} \exp(-\pi\tau w'^2/\alpha')}{\eta(\tfrac{1}{2}i\tau)^{24}} \right] +$$

$$+ \left[\frac{1}{8} \int_0^\infty \frac{d\tau}{\tau^{14-n/2}} \frac{\sum_\Lambda \exp(-\pi\tau w^2/\alpha')}{\eta(2i\tau)^{24}} \right]$$

$$+ \left[-\tfrac{1}{8}\,\mathrm{Tr}(\mathbb{1}_D) \int_0^\infty \frac{d\tau}{\tau^{14-n/2}} \frac{2^n \sum_\Lambda \exp(-\pi\tau w^2/\alpha') + 2^n(2^n-1)\sum_{\Lambda'} \exp(-\pi\tau w'^2/\alpha')}{\eta(\tfrac{1}{2}i\tau+\tfrac{1}{2})^{24}} \right] =$$

$$= \frac{2^{13-n/2}}{4} \int_{-1}^{1} \frac{dq}{2\pi q} \left(\frac{-\log|q|}{2\pi} \right)^{-n/2} \frac{1}{\eta(q)^{24}}$$

From Wikipedia:

For any complex number τ with $\mathbf{Im}(\tau) > 0$, let $q = e^{2\pi i\tau}$, then the eta function is defined by,

$$\eta(\tau) = e^{\frac{\pi i\tau}{12}} \prod_{n=1}^{\infty}(1 - e^{2n\pi i\tau}) = q^{\frac{1}{24}} \prod_{n=1}^{\infty}(1 - q^n).$$

The notation $q \equiv e^{2\pi i\tau}$ is now standard in number theory, though many older books use q for the nome $e^{\pi i\tau}$. Raising the eta equation to the 24th power and multiplying by $(2\pi)^{12}$ gives

$$\Delta(\tau) = (2\pi)^{12}\eta^{24}(\tau)$$

where Δ is the modular discriminant. The presence of 24 can be understood by connection with other occurrences, such as in the 24-dimensional Leech lattice.

[1/(2Pi*535.49165)*1/(((-ln(535.49165/(2Pi))))*(((1/((((535.49165)))^(1/24)*((1-535.49165^2))))))^24]

Input interpretation:

$$\frac{1}{2\pi \times 535.49165}\left(-\frac{1}{\frac{\log(535.49165)}{2\pi}}\right)\left(\frac{1}{\sqrt[24]{535.49165}\,(1-535.49165^2)}\right)^{24}$$

$\log(x)$ is the natural logarithm

Result:

$-5.81060\ldots \times 10^{-138}$

-5.8106…*10^{-138}

Alternative representations:

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,(1-535.492^2)}\right)^{24}}{\frac{\log(535.492)(2\pi 535.492)}{2\pi}} = \frac{\left(\frac{1}{(1-535.492^2)\sqrt[24]{535.492}}\right)^{24}}{\frac{(1070.98\pi)(-\log_e(535.492))}{2\pi}}$$

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,(1-535.492^2)}\right)^{24}}{\frac{\log(535.492)(2\pi 535.492)}{2\pi}} = \frac{\left(\frac{1}{(1-535.492^2)\sqrt[24]{535.492}}\right)^{24}}{\frac{(1070.98\pi)\mathrm{Li}_1(-534.492)}{2\pi}}$$

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,(1-535.492^2)}\right)^{24}}{\frac{\log(535.492)(2\pi 535.492)}{2\pi}} = \frac{\left(\frac{1}{(1-535.492^2)\sqrt[24]{535.492}}\right)^{24}}{\frac{(1070.98\pi)(-\log(a)\log_a(535.492))}{2\pi}}$$

Series representations:

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,(1-535.492^2)}\right)^{24}}{\frac{\log(535.492)(2\pi 535.492)}{2\pi}} = -\frac{3.65091\times 10^{-137}}{\log(534.492)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-6.28132k}}{k}}$$

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,(1-535.492^2)}\right)^{24}}{\frac{\log(535.492)(2\pi 535.492)}{2\pi}} = -\frac{3.65091\times 10^{-137}}{2i\pi\left\lfloor\frac{\arg(535.492-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(535.492-x)^k x^{-k}}{k}} \quad \text{for } x<0$$

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,\left(1-535.492^2\right)}\right)^{24}}{\frac{\log(535.492)\,(2\,\pi\,535.492)}{2\,\pi}} =$$

$$-\frac{3.65091\times10^{-137}}{\log(z_0)+\left\lfloor\frac{\arg(535.492-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(535.492-z_0)^k\,z_0^{-k}}{k}}$$

Integral representations:

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,\left(1-535.492^2\right)}\right)^{24}}{\frac{\log(535.492)\,(2\,\pi\,535.492)}{2\,\pi}} = -\frac{3.65091\times10^{-137}}{\int_1^{535.492}\frac{1}{t}\,dt}$$

$$-\frac{\left(\frac{1}{\sqrt[24]{535.492}\,\left(1-535.492^2\right)}\right)^{24}}{\frac{\log(535.492)\,(2\,\pi\,535.492)}{2\,\pi}} = -\frac{7.30182\times10^{-137}\,i\,\pi}{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-6.28132\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

(2^(13-1))/4 integrate [1/(2Pi*535.49165)*1/(((-ln(535.49165)/(2Pi))))*(((1/((((535.49165)))^(1/24)*((1-535.49165^2))))))^24]x, from - 1 to 0

Definite integral:

$$1024\int_{-1}^{0}-5.8106\times10^{-138}\,x\,dx = 2.97503\times10^{-135}$$

(2^(13-1))/4 integrate [1/(2Pi*535.49165)*1/(((-ln(535.49165)/(2Pi))))*(((1/((((535.49165)))^(1/24)*((1-535.49165^2))))))^24]x, from 0 to 1

Definite integral:

$$1024\int_{0}^{1}-5.8106\times10^{-138}\,x\,dx = -2.97503\times10^{-135}$$

Thence:

(2^(13-1))/4 * integrate [1/(2Pi*535.49165)*1/(((-ln(535.49165)/(2Pi))))*(((1/((((535.49165)))^(1/24)*((1-535.49165^2))))))^24]x

Input interpretation:

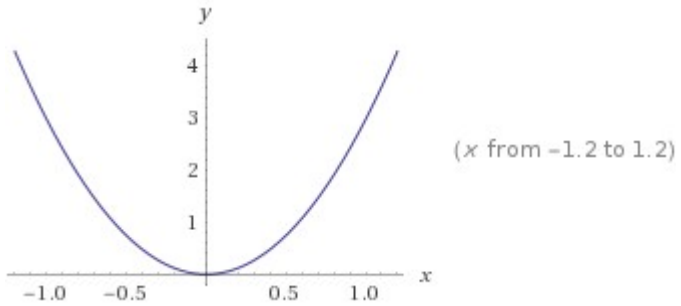
$$\frac{2^{13-1}}{4}\int\left(\frac{1}{2\pi\times 535.49165}\left(-\frac{1}{\frac{\log(535.49165)}{2\pi}}\right)\left(\frac{1}{\sqrt[24]{535.49165}\,\left(1-535.49165^2\right)}\right)^{24}\right)x\,dx$$

$\log(x)$ is the natural logarithm

Result:

$-2.97503\times 10^{-135}\,x^2$

Plot:



(x from −1.2 to 1.2)

Or:

Input interpretation:

$$\frac{2^{13-1}}{4}\int-\frac{\frac{1}{2\pi\times 535.49165}\left(\frac{1}{\sqrt[24]{535.49165}\,\left(1-535.49165^2\right)}\right)^{24}}{\frac{\log(535.49165)}{2\pi}}\,x\,dx$$

$\log(x)$ is the natural logarithm

Result:

$-2.97503\times 10^{-135}\,x^2$

-2.97503*10^{-135}

The result is: 2.97503×10^{-135}

From:

$$Z^{(a)}_{(NN,+)} + Z^{(k)}_{(++)} + Z^{(m)}_{(++)} = \frac{2^{13}}{4}\frac{V}{(4\pi^2\alpha')^{n/2}}\int_{-1}^{1}\frac{dq}{2\pi q}\frac{1}{\eta(q)^{24}},$$

where V denotes the (diverging) volume of the torus covering the orbifold.

We obtain, for r = 2 and R = 3, the following volume:

$V = 2\pi^2 Rr^2 = 24\pi^2$

(2^13)/4 * ((24Pi^2)/(4Pi^2*0.956866673)) integrate
[1/(2Pi*535.49165)*(((1/((((535.49165)))^(1/24)*((1-535.49165^2))))))^24]x

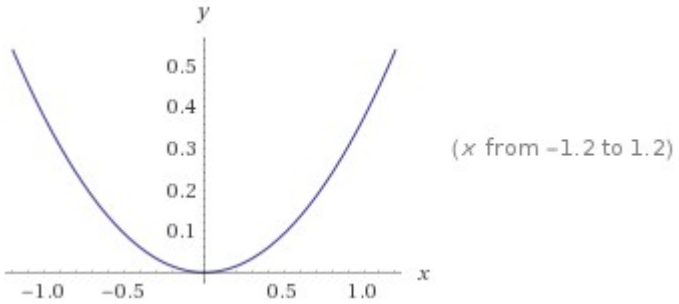
Input interpretation:

$$\frac{2^{13}}{4}\times\frac{24\pi^2}{4\pi^2\times0.956866673}\int\left(\frac{1}{2\pi\times535.49165}\left(\frac{1}{\sqrt[24]{535.49165}\,(1-535.49165^2)}\right)^{24}\right)x\,dx$$

Result:

$3.73096\times10^{-134}\,x^2$

Plot:



(x from −1.2 to 1.2)

(2^13)/4 * ((24Pi^2)/(4Pi^2*0.956866673)) integrate [1/(2Pi*535.49165)*(((1/((((535.49165)))^(1/24)*((1-535.49165^2))))))^24]x, from 0 to 1

Definite integral:

$$12\,841.9\int_0^1 5.8106\times10^{-138}\,x\,dx = 3.73096\times10^{-134}$$

The result is: 3.73096×10^{-134}

The ratio between the two results is:

(3.73096×10^-134 * 1 / 2.97503×10^-135)

Input interpretation:

$$\frac{3.73096}{10^{134}}\times\frac{1}{\frac{2.97503}{10^{135}}}$$

Result:

12.540915553792734863177850307391858233362352648544720557 43...

12.540915…. ≈ 12.54 ≈ 4π and equal to the Bekenstein-Hawking black hole entropy 12.5664

Possible closed forms:

$$\frac{627}{50} = 12.54$$

$$4\pi \approx 12.566370$$

$$3\sqrt{-10\,M} \approx 12.5411647$$

1+1*1/[1/8(3.73096×10^-134 * 1 / 2.97503×10^-135)]

Input interpretation:

$$1+1\times\frac{1}{\frac{1}{8}\left(\frac{3.73096}{10^{134}}\times\frac{1}{\frac{2.97503}{10^{135}}}\right)}$$

Result:

1.637911958316358256320089199562579068121877479254669039603...

1.6349119583….. $\approx \zeta(2) = \frac{\pi^2}{6} = 1.644934$ ...

Performing and summing the ln of the two results, we obtain:

-[ln(3.73096×10^-134)+ln(2.97503×10^-135)]+8+2

Input interpretation:

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2$$

$\log(x)$ is the natural logarithm

Result:

626.98847...

626.98847…. result practically equal to the value of p(20) = 627

Alternative representations:

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2 = 10-\log\left(\frac{11.0997}{10^{135}\times 10^{134}}\right)$$

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2 = 10-\log(a)\log_a\left(\frac{2.97503}{10^{135}}\right)-\log(a)\log_a\left(\frac{3.73096}{10^{134}}\right)$$

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2 = 10-\log_e\left(\frac{2.97503}{10^{135}}\right)-\log_e\left(\frac{3.73096}{10^{134}}\right)$$

Series representations:

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2=$$
$$10-2\,i\,\pi\left\lfloor\frac{\arg(2.97503\times10^{-135}-x)}{2\,\pi}\right\rfloor-2\,i\,\pi\left\lfloor\frac{\arg(3.73096\times10^{-134}-x)}{2\,\pi}\right\rfloor-2\log(x)-$$
$$\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-x)^k+(3.73096\times10^{-134}-x)^k\right)x^{-k}}{k}\quad\text{for } x<0$$

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2=10-\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-$$
$$\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-2\log(z_0)-$$
$$\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\,\pi}\right\rfloor\log(z_0)-\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\,\pi}\right\rfloor\log(z_0)-$$
$$\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2=$$
$$10-2\,i\,\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{2.97503\times10^{-135}}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor-$$
$$2\,i\,\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{3.73096\times10^{-134}}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor-2\log(z_0)-$$
$$\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

Integral representation:

$$-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8+2=$$
$$10+\int_1^{2.97503\times10^{-135}}\left(-\frac{1}{t}-\frac{1}{3.43346\times10^{-134}+t}\right)dt$$

We note also that:

2*((((1/11 ((-[ln(3.73096×10^-134)+ln(2.97503×10^-135)])) + 8))))^2 - 21 - 2

Where 2 and 21 are Fibonacci numbers

Input interpretation:

$$2\left(\frac{1}{11}\left(-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)\right)+8\right)^2-21-2$$

$\log(x)$ is the natural logarithm

Result:

8192.0206...

8192.0206… ≈ 8192 = 2*64^2

Alternative representations:

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$-23+2\left(8-\frac{1}{11}\log\left(\frac{11.0997}{10^{135}\times 10^{134}}\right)\right)^2$$

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$-23+2\left(8+\frac{1}{11}\left(-\log_e\left(\frac{2.97503}{10^{135}}\right)-\log_e\left(\frac{3.73096}{10^{134}}\right)\right)\right)^2$$

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$-23+2\left(8+\frac{1}{11}\left(-\log(a)\log_a\left(\frac{2.97503}{10^{135}}\right)-\log(a)\log_a\left(\frac{3.73096}{10^{134}}\right)\right)\right)^2$$

Series representations:

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$-23+\frac{2}{121}\left(-88+2i\pi\left\lfloor\frac{\arg(2.97503\times 10^{-135}-x)}{2\pi}\right\rfloor+2i\pi\left\lfloor\frac{\arg(3.73096\times 10^{-134}-x)}{2\pi}\right\rfloor+2\log(x)+\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times 10^{-135}-x)^k+(3.73096\times 10^{-134}-x)^k\right)x^{-k}}{k}\right)^2$$

for $x<0$

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$-23+2\left(8+\frac{1}{11}\left(-2\log(z_0)-\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}\right)\right)^2$$

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$-23+\frac{2}{121}\left(-88+2i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{2.97503\times10^{-135}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+2i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{3.73096\times10^{-134}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+2\log(z_0)+\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}\right)^2$$

Integral representation:

$$2\left(-\frac{1}{11}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+8\right)^2-21-2=$$
$$\frac{1}{121}\left(12\,705+2\left(\int_1^{2.97503\times10^{-135}}\frac{1}{t}\,dt\right)^2+2\left(\int_1^{3.73096\times10^{-134}}\frac{1}{t}\,dt\right)^2+121\int_1^{2.97503\times10^{-135}}\frac{-9.98824\times10^{-134}-5.81818\,t}{t\,(3.43346\times10^{-134}+t)}\,dt+\int_0^1\int_0^1\frac{1}{(-1+t_1)(-1+t_2)}\,dt_2\,dt_1\right)$$

We have also:

e * ((-[ln(3.73096×10^-134)+ln(2.97503×10^-135)])) + 55 – 3

Input interpretation:

$$e\left(-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)\right)+55-3$$

$\log(x)$ is the natural logarithm

Result:

1729.14855...

1729.14855…

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. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

Alternative representations:

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=52-e\log\left(\frac{11.0997}{10^{135}\times 10^{134}}\right)$$

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=$$
$$52+e\left(-\log(a)\log_a\left(\frac{2.97503}{10^{135}}\right)-\log(a)\log_a\left(\frac{3.73096}{10^{134}}\right)\right)$$

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=$$
$$52+e\left(-\log_e\left(\frac{2.97503}{10^{135}}\right)-\log_e\left(\frac{3.73096}{10^{134}}\right)\right)$$

Series representations:

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=$$
$$52-2\,e\,i\,\pi\left\lfloor\frac{\arg(2.97503\times10^{-135}-x)}{2\,\pi}\right\rfloor-$$
$$2\,e\,i\,\pi\left\lfloor\frac{\arg(3.73096\times10^{-134}-x)}{2\,\pi}\right\rfloor-2\,e\log(x)-$$
$$e\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-x)^k+(3.73096\times10^{-134}-x)^k\right)x^{-k}}{k}\quad\text{for } x<0$$

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=$$
$$52-e\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-$$
$$e\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-2\,e\log(z_0)-$$
$$e\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\,\pi}\right\rfloor\log(z_0)-e\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\,\pi}\right\rfloor\log(z_0)-$$
$$e\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=$$
$$52-2\,e\,i\,\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{2.97503\times10^{-135}}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor-$$
$$2\,e\,i\,\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{3.73096\times10^{-134}}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor-2\,e\log(z_0)-$$
$$e\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

Integral representation:

$$e\,(-1)\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+55-3=$$
$$52+\int_1^{2.97503\times10^{-135}}e\left(-\frac{1}{t}-\frac{1}{3.43346\times10^{-134}+t}\right)dt$$

From which:

((((e * ((-[ln(3.73096×10^-134)+ln(2.97503×10^-135)])) + 55 - 3))))^1/15

Input interpretation:

$$\sqrt[15]{e\left(-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)\right)+55-3}$$

$\log(x)$ is the natural logarithm

Result:

1.643824644...

$1.643824644\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

And again:

1/5 * ((-[ln(3.73096×10^-134)+ln(2.97503×10^-135)]))+2

Input interpretation:

$$\frac{1}{5}\left(-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)\right)+2$$

$\log(x)$ is the natural logarithm

Result:

125.39769...

125.39769… result very near to the Higgs boson mass 125.18 GeV

Alternative representations:

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=2-\frac{1}{5}\log\left(\frac{11.0997}{10^{135}\times 10^{134}}\right)$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=$$
$$2+\frac{1}{5}\left(-\log(a)\log_a\left(\frac{2.97503}{10^{135}}\right)-\log(a)\log_a\left(\frac{3.73096}{10^{134}}\right)\right)$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=2+\frac{1}{5}\left(-\log_e\left(\frac{2.97503}{10^{135}}\right)-\log_e\left(\frac{3.73096}{10^{134}}\right)\right)$$

Series representations:

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=2-$$
$$\frac{2}{5}i\pi\left\lfloor\frac{\arg(2.97503\times10^{-135}-x)}{2\pi}\right\rfloor-\frac{2}{5}i\pi\left\lfloor\frac{\arg(3.73096\times10^{-134}-x)}{2\pi}\right\rfloor-\frac{2\log(x)}{5}-$$
$$\frac{1}{5}\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-x)^k+(3.73096\times10^{-134}-x)^k\right)x^{-k}}{k}\quad\text{for } x<0$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=2-\frac{1}{5}\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-$$
$$\frac{1}{5}\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-\frac{2\log(z_0)}{5}-$$
$$\frac{1}{5}\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\pi}\right\rfloor\log(z_0)-\frac{1}{5}\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\pi}\right\rfloor\log(z_0)-$$
$$\frac{1}{5}\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=$$
$$2-\frac{2}{5}i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{2.97503\times10^{-135}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor-$$
$$\frac{2}{5}i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{3.73096\times10^{-134}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor-\frac{2\log(z_0)}{5}-$$
$$\frac{1}{5}\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

Integral representation:

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+2=$$
$$2+\int_1^{2.97503\times10^{-135}}\frac{-6.86691\times10^{-135}-0.4\,t}{t\,(3.43346\times10^{-134}+t)}\,dt$$

1/5 * ((-[ln(3.73096×10^-134)+ln(2.97503×10^-135)]))+13+3

Input interpretation:

$$\frac{1}{5}\left(-\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)\right)+13+3$$

$\log(x)$ is the natural logarithm

Result:

139.397694...

139.397694… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=16-\frac{1}{5}\log\left(\frac{11.0997}{10^{135}\times10^{134}}\right)$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=$$
$$16+\frac{1}{5}\left(-\log(a)\log_a\left(\frac{2.97503}{10^{135}}\right)-\log(a)\log_a\left(\frac{3.73096}{10^{134}}\right)\right)$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=$$
$$16+\frac{1}{5}\left(-\log_e\left(\frac{2.97503}{10^{135}}\right)-\log_e\left(\frac{3.73096}{10^{134}}\right)\right)$$

Series representations:

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=16-\frac{2}{5}i\pi\left\lfloor\frac{\arg(2.97503\times10^{-135}-x)}{2\pi}\right\rfloor-\frac{2}{5}i\pi\left\lfloor\frac{\arg(3.73096\times10^{-134}-x)}{2\pi}\right\rfloor-\frac{2\log(x)}{5}-\frac{1}{5}\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-x)^k+(3.73096\times10^{-134}-x)^k\right)x^{-k}}{k}\quad\text{for } x<0$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=16-\frac{1}{5}\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-\frac{1}{5}\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)-\frac{2\log(z_0)}{5}-\frac{1}{5}\left\lfloor\frac{\arg(2.97503\times10^{-135}-z_0)}{2\pi}\right\rfloor\log(z_0)-\frac{1}{5}\left\lfloor\frac{\arg(3.73096\times10^{-134}-z_0)}{2\pi}\right\rfloor\log(z_0)-\frac{1}{5}\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=16-\frac{2}{5}i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{2.97503\times10^{-135}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor-\frac{2}{5}i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{3.73096\times10^{-134}}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor-\frac{2\log(z_0)}{5}-\frac{1}{5}\sum_{k=1}^{\infty}\frac{(-1)^{1+k}\left((2.97503\times10^{-135}-z_0)^k+(3.73096\times10^{-134}-z_0)^k\right)z_0^{-k}}{k}$$

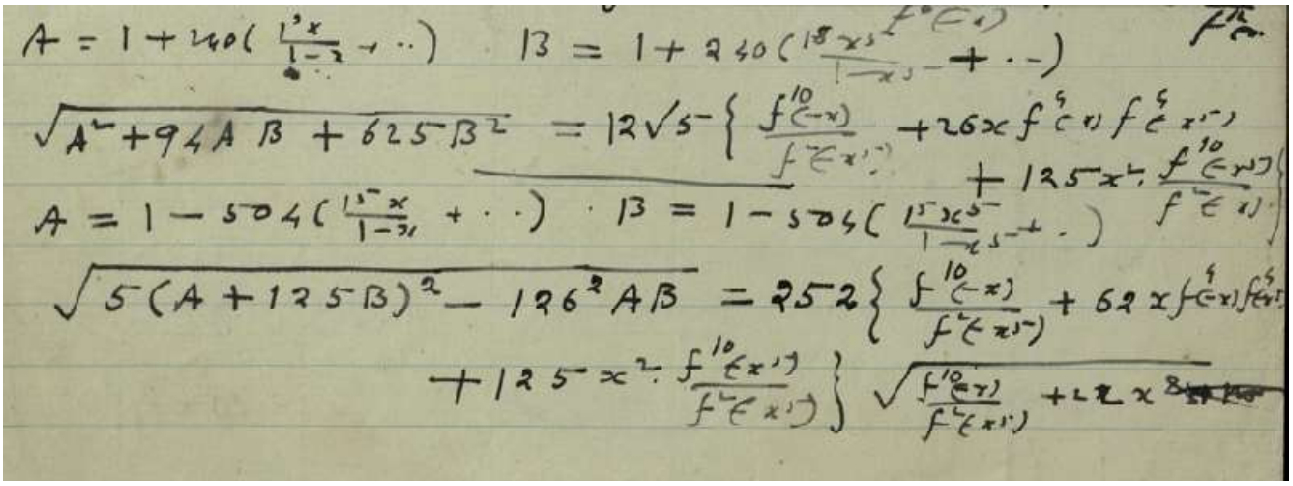
Integral representation:

$$-\frac{1}{5}\left(\log\left(\frac{3.73096}{10^{134}}\right)+\log\left(\frac{2.97503}{10^{135}}\right)\right)+13+3=16+\int_1^{2.97503\times10^{-135}}\frac{-6.86691\times10^{-135}-0.4\,t}{t\,(3.43346\times10^{-134}+t)}\,dt$$

From

https://archives.trin.cam.ac.uk/index.php/papers-of-srinivasa-ramanujan

https://mss-cat.trin.cam.ac.uk/manuscripts/uv/view.php?n=Add.Ms.a.94.15



1+240(2/(1-2))

Input:

$$1+240\times\frac{2}{1-2}$$

Result:

$$-479$$

-479 = A

1+240(2^5)/(1-2^5)

Input:

$$1+240\times\frac{2^5}{1-2^5}$$

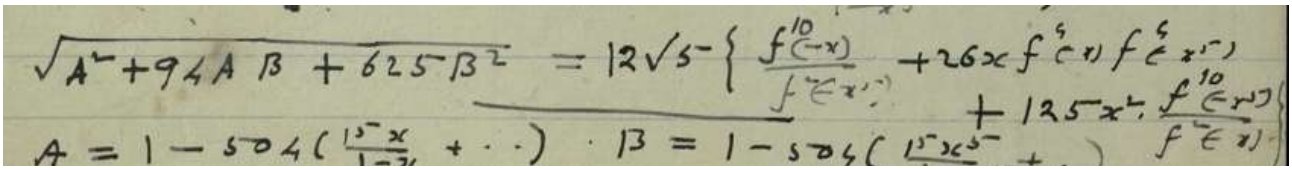
Exact result:

$$-\frac{7649}{31}$$

Decimal approximation:

−246.741935483870967741935483870967741935483870967741935483...

-246.74193548…. = B



sqrt(((-479^2+94*(-479)(-246.74193548)+625(-246.74193548)^2)))

Input interpretation:

$$\sqrt{-479^2 + 94 \times (-479) \times (-246.74193548) + 625\,(-246.74193548)^2}$$

Result:

6995.0947520...

6995.0947520….

(12*sqrt5)*(a+26*2*b+125*2^2*c) = 6995.0947520

Input interpretation:

$$\left(12\sqrt{5}\right)(a + 26 \times 2\,b + 125 \times 2^2\,c) = 6995.0947520$$

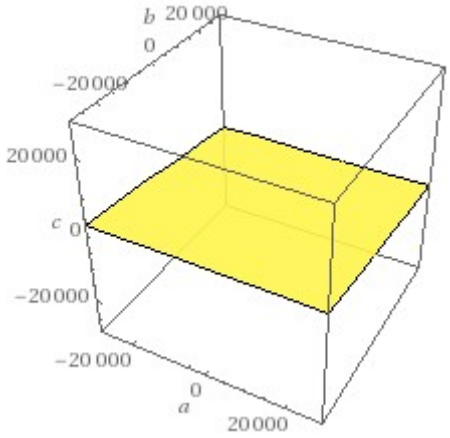
Result:

$$12\sqrt{5}\ (a + 52\,b + 500\,c) = 6995.0947520$$

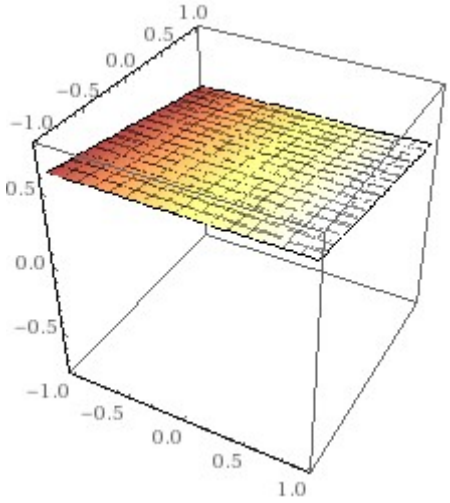
Geometric figure:

plane

Visual representation:



Plot:



Alternate forms:

$$c = -\frac{a}{500} - \frac{13\,b}{125} + 0.52138357915$$

$$12\sqrt{5}\ a + 624\sqrt{5}\ b + 6000\sqrt{5}\ c - 6995.0947520 = 0$$

Expanded form:

$$12\sqrt{5}\ a + 624\sqrt{5}\ b + 6000\sqrt{5}\ c = 6995.0947520$$

Real solution:

$$c \approx -0.0020000000000\,a - 0.10400000000\,b + 0.5213835792$$

Solution:

$c \approx -0.0020000000000\, a - 0.10400000000\, b + 0.5213835792$

Solution for the variable c:

$c \approx 0.00007453559925\,(-26.832815730\, a - 1395.3064180\, b + 6995.0947520)$

From

$$c = -\frac{a}{500} - \frac{13\, b}{125} + 0.52138357915$$

we obtain:

(12*sqrt5)*(a+26*2*b+125*2^2*(0.52138357915 - a/500 - (13 b)/125)) = 6995.0947520

Input interpretation:

$$\left(12\sqrt{5}\right)\left(a + 26\times 2\, b + 125\times 2^2\left(0.52138357915 - \frac{a}{500} - \frac{13\, b}{125}\right)\right) = 6995.0947520$$

Result:

$$12\sqrt{5}\left(500\left(-\frac{a}{500} - \frac{13\, b}{125} + 0.52138357915\right) + a + 52\, b\right) = 6995.0947520$$

Alternate form:

True

Alternate form assuming a and b are positive:

$$6000\sqrt{5}\left(-\frac{a}{500} - \frac{13\, b}{125} + 0.52138357915\right) + 12\sqrt{5}\; a + 624\sqrt{5}\; b = 6995.0947520$$

For a = 2 and b = 3, (that are positive) we obtain:

12 sqrt(5) (500 (-2/500 - (13*3)/125 + 0.52138357915) + 2+ 52*3)

Input interpretation:

$$12\sqrt{5}\left(500\left(-\frac{2}{500} - \frac{13\times 3}{125} + 0.52138357915\right) + 2 + 52\times 3\right)$$

Result:

6995.0947520...

6995.0947520…

From the formula of coefficients of the '5th order' mock theta function $\psi_1(q)$: (A053261 OEIS Sequence)

sqrt(golden ratio) * exp(Pi*sqrt(n/15)) / (2*5^(1/4)*sqrt(n)) for n = 235 , we obtain:

sqrt(golden ratio) * exp(Pi*sqrt(235/15)) / (2*5^(1/4)*sqrt(235)) + 18 + 2

where 18 and 2 are Fibonacci numbers

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{235}{15}}\right)}{2 \sqrt[4]{5}\ \sqrt{235}} + 18 + 2$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{47/3}\ \pi} \sqrt{\frac{\phi}{47}}}{2 \times 5^{3/4}} + 20$$

Decimal approximation:

6995.005898875013014449076644778326094990379111076236476684...

6995.0058988…

Property:

$$20 + \frac{e^{\sqrt{47/3}\ \pi} \sqrt{\frac{\phi}{47}}}{2 \times 5^{3/4}}$$ is a transcendental number

Alternate forms:

$$20+\frac{1}{10}\sqrt{\frac{1}{94}\left(5+\sqrt{5}\right)}\;e^{\sqrt{47/3}\,\pi}$$

$$20+\frac{\sqrt{\frac{1}{94}\left(1+\sqrt{5}\right)}\;e^{\sqrt{47/3}\,\pi}}{2\times 5^{3/4}}$$

$$\frac{1}{940}\left(18\,800+\sqrt[4]{5}\;\sqrt{94\left(1+\sqrt{5}\right)}\;e^{\sqrt{47/3}\,\pi}\right)$$

Series representations:

$$\frac{\sqrt{\phi}\;\exp\left(\pi\sqrt{\frac{235}{15}}\right)}{2\sqrt[4]{5}\;\sqrt{235}}+18+2=\left(200\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(235-z_0)^k\,z_0^{-k}}{k!}+5^{3/4}\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{47}{3}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\,z_0^{-k}}{k!}\right)\Big/\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(235-z_0)^k\,z_0^{-k}}{k!}\right)\quad\text{for}\quad(\text{not}\;(z_0\in\mathbb{R}\;\text{and}\;-\infty<z_0\le 0))$$

$$\frac{\sqrt{\phi}\;\exp\left(\pi\sqrt{\frac{235}{15}}\right)}{2\sqrt[4]{5}\;\sqrt{235}}+18+2=\left(200\exp\left(i\pi\left\lfloor\frac{\arg(235-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(235-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+5^{3/4}\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{47}{3}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{47}{3}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(10\exp\left(i\pi\left\lfloor\frac{\arg(235-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(235-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\quad\text{for}\quad(x\in\mathbb{R}\;\text{and}\;x<0)$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{235}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{235}}+18+2=\left(\left(\frac{1}{z_0}\right)^{-1/2\,[\arg(235-z_0)/(2\pi)]}\ z_0^{-1/2\,[\arg(235-z_0)/(2\pi)]}\right.$$
$$\left(200\left(\frac{1}{z_0}\right)^{1/2\,[\arg(235-z_0)/(2\pi)]}\ z_0^{1/2\,[\arg(235-z_0)/(2\pi)]}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(235-z_0)^k\,z_0^{-k}}{k!}+\right.$$
$$5^{3/4}\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left[\arg\left(\frac{47}{3}-z_0\right)/(2\pi)\right]}\ z_0^{1/2\left(1+\left[\arg\left(\frac{47}{3}-z_0\right)/(2\pi)\right]\right)}\right.$$
$$\left.\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{47}{3}-z_0\right)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\,[\arg(\phi-z_0)/(2\pi)]}\right.$$
$$\left.z_0^{1/2\,[\arg(\phi-z_0)/(2\pi)]}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\,z_0^{-k}}{k!}\right)\Bigg)\Bigg/$$
$$\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(235-z_0)^k\,z_0^{-k}}{k!}\right)$$

From the principal expression, we obtain also:

1/4 * sqrt(((-479^2+94*(-479)(-246.74193548)+625(-246.74193548)^2))) - 18 -2

Input interpretation:

$$\frac{1}{4}\sqrt{-479^2+94\times(-479)\times(-246.74193548)+625\,(-246.74193548)^2}-18-2$$

Result:

1728.7736880...

1728.773688… ≈ 1729

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. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

(((1/4 * sqrt(((-479^2+94*(-479)(-246.74193548)+625(-246.74193548)^2))) - 18 - 2)))^1/15

Input interpretation:

$$\sqrt[15]{\frac{1}{4}\sqrt{-479^2+94\times(-479)\times(-246.74193548)+625\,(-246.74193548)^2}-18-2}$$

Result:

1.64380088374...

1.64380088374.... $\approx \zeta(2) = \frac{\pi^2}{6} = 1.644934$ ...

sqrt(sqrt(((-479^2+94*(-479)(-246.74193548)+625(-246.74193548)^2))))+47+11-2

Input interpretation:

$$\sqrt{\sqrt{-479^2+94\times(-479)\times(-246.74193548)+625\,(-246.74193548)^2}+47+11-2}$$

Result:

139.636683052...

139.636683052… result practically equal to the rest mass of Pion meson 139.57 MeV

sqrt(sqrt(((-479^2+94*(-479)(-246.74193548)+625(-246.74193548)^2))))+47-7+2

Input interpretation:

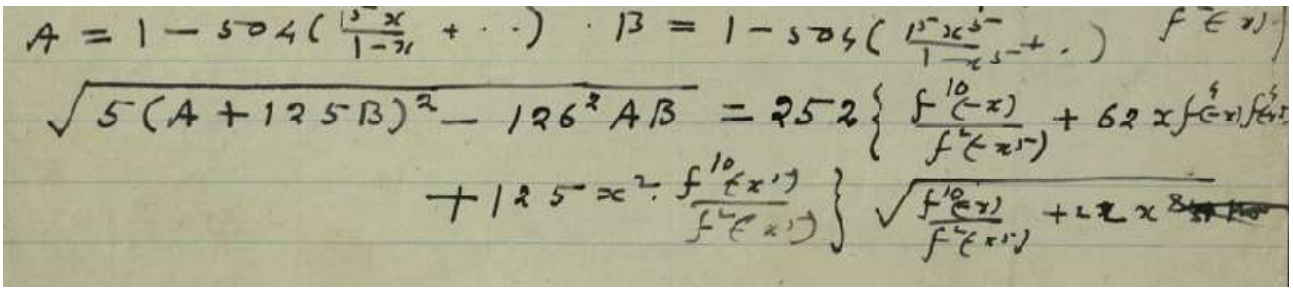
$$\sqrt{\sqrt{-479^2+94\times(-479)\times(-246.74193548)+625\,(-246.74193548)^2}+47-7+2}$$

Result:

125.636683052...

125.636683052… result very near to the Higgs boson mass 125.18 GeV

From:



sqrt(((5(1009+125*521.25806451)^2-126^2(1009*521.25806451)))

1-504(2(1-2))

Input:

$1 - 504\,(2\,(1 - 2))$

Result:

1009

1009 = A

1-504(2^5)/(1-2^5)

Input:

$1 - 504 \times \frac{2^5}{1 - 2^5}$

Exact result:

$\frac{16\,159}{31}$

Decimal approximation:

521.258064516129032258064516129032258064516129032258064516...

521.25806451 = B

sqrt(((5(1009+125*521.25806451)^2-126^2(1009*521.25806451)))

Input interpretation:

$$\sqrt{5\,(1009 + 125\times521.25806451)^2 - 126^2\,(1009\times521.25806451)}$$

Result:

116361.05904...

116361.05904…

116361.05904 = 252((a+62*2*b+125*2^2*c)*sqrt(((a)+22*2^8)))

Input interpretation:

$$116\,361.05904 = 252\left((a + 62\times2\,b + 125\times2^2\,c)\sqrt{a + 22\times2^8}\right)$$

Result:

$$116\,361.05904 = 252\sqrt{a + 5632}\;(a + 124\,b + 500\,c)$$

Alternate form:

$$\sqrt{a + 5632}\;c = 0.9235004686 - 0.0020000000000\sqrt{a + 5632}\;\text{Null}\left(\frac{1.0000000000\,a}{\text{Null}} + \frac{124.00000000\,b}{\text{Null}}\right)$$

Alternate form assuming a, b, and c are positive:

$$\sqrt{a + 5632}\;(1.000000000\,a + 124.0000000\,b + 500.0000000\,c) = 461.7502343$$

Expanded form:

$$116\,361.05904 = 31\,248\sqrt{a + 5632}\;b + 126\,000\sqrt{a + 5632}\;c + 252\sqrt{a + 5632}\;a$$

Solution:

$$a + 5632.000000000000 \neq 0,$$
$$c \approx \left(2.928600714578574\times10^{-8}\left(-68\,292.00000000000\,a^2 - 8.468208000000000\times10^6\,a\,b - 3.846205440000000\times10^8\,a + 3.153384700000000\times10^7\sqrt{a + 5632.000000000000} - 4.769294745600000\times10^{10}\,b\right)\right)\Big/(a + 5632.000000000000)$$

Solution for the variable c:

$$c \approx -\frac{7.9365079365\times10^{-6}\left(252\sqrt{a+5632}\ a+31\,248\sqrt{a+5632}\ b-116\,361.05904\right)}{\sqrt{a+5632}}$$

Implicit derivatives:

$$\frac{\partial a(b,c)}{\partial c}=-\frac{1000\,(5632+a)}{11\,264+3\,a+124\,b+500\,c}$$

$$\frac{\partial a(b,c)}{\partial b}=-\frac{248\,(5632+a)}{11\,264+3\,a+124\,b+500\,c}$$

$$\frac{\partial b(a,c)}{\partial c}=-\frac{125}{31}$$

$$\frac{\partial b(a,c)}{\partial a}=-\frac{11\,264+3\,a+124\,b+500\,c}{248\,(5632+a)}$$

$$\frac{\partial c(a,b)}{\partial b}=-\frac{31}{125}$$

$$\frac{\partial c(a,b)}{\partial a}=-\frac{11\,264+3\,a+124\,b+500\,c}{1000\,(5632+a)}$$

For

$$c \approx -\frac{7.9365079365\times10^{-6}\left(252\sqrt{a+5632}\ a+31\,248\sqrt{a+5632}\ b-116\,361.05904\right)}{\sqrt{a+5632}}$$

we obtain:

116361.05904 = 252((a+62*2*b+125*2^2*(-(7.9365079365×10^-6 (252 sqrt(a + 5632) a + 31248 sqrt(a + 5632) b - 116361.05904))/sqrt(a + 5632)))*sqrt(((a)+22*2^8)))

Input interpretation:

$$116\,361.05904 = 252\left(\left(a+62\times2\,b+125\times2^2\left(-\frac{1}{\sqrt{a+5632}}7.9365079365\times10^{-6}\left(252\sqrt{a+5632}\ a+31\,248\sqrt{a+5632}\ b-116\,361.05904\right)\right)\right)\sqrt{a+22\times2^8}\right)$$

Result:

True

For $a = 2$ and $b = 3$, we obtain:

252((2+62*2*3+125*2^2*(-(7.9365079365×10^-6 (252 sqrt(2 + 5632) 2 + 31248 sqrt(2 + 5632) 3 - 116361.05904))/sqrt(2 + 5632)))*sqrt(((2)+22*2^8)))

Input interpretation:

$$252\left(\left(2+62\times 2\times 3+125\times 2^2\left(-\frac{1}{\sqrt{2+5632}}7.9365079365\times 10^{-6}\left(252\sqrt{2+5632}\times 2+31\,248\sqrt{2+5632}\times 3-116\,361.05904\right)\right)\right)\sqrt{2+22\times 2^8}\right)$$

Result:

116361.059...

116361.059…

Dividing this result by the previous solution, i.e. 6995.094752, we obtain:

[252((2+62*2*3+125*2^2*(-(7.9365079365×10^-6 (252 sqrt(2 + 5632) 2 + 31248 sqrt(2 + 5632) 3 - 116361.05904))/sqrt(2 + 5632)))*sqrt(((2)+22*2^8)))] / 6995.094752

Input interpretation:

$$\frac{1}{6995.094752}252\left(\left(2+62\times 2\times 3+125\times 2^2\left(-\frac{1}{\sqrt{2+5632}}7.9365079365\times 10^{-6}\left(252\sqrt{2+5632}\times 2+31\,248\sqrt{2+5632}\times 3-116\,361.05904\right)\right)\right)\sqrt{2+22\times 2^8}\right)$$

Result:

16.6346652...

16.6346652… result very near to the black hole entropy 16.8741, that is equal to ln(21296876)

1/29((((([252((2+62*2*3+125*2^2*(-(7.9365079365×10^-6 (252 sqrt(2 + 5632) 2 + 31248 sqrt(2 + 5632) 3 - 116361.05904))/sqrt(2 + 5632)))*sqrt(((2)+22*2^8)))] + 6995.094752))))+123-4-1/golden ratio – 276

Input interpretation:

$$\frac{1}{29}\left(252\left(\left(2+62\times 2\times 3+125\times 2^2\left(-\frac{1}{\sqrt{2+5632}}7.9365079365\times 10^{-6}\left(252\sqrt{2+5632}\times 2+31\,248\sqrt{2+5632}\times 3-116\,361.05904\right)\right)\right)\sqrt{2+22\times 2^8}\right)+6995.094752\right)+123-4-\frac{1}{\phi}-276$$

ϕ is the golden ratio

Result:

4096.04244...

4096.04244…. ≈ 4096

And:

ln(116361.059) * ln(6995.094752)

Input interpretation:

$$\log(116\,361.059)\,\log(6995.094752)$$

$\log(x)$ is the natural logarithm

Result:

103.2649894...

103.2649894… result near to the value of p(13) = 101

Alternative representations:

$$\log(116\,361.)\,\log(6995.09) = \log_e(6995.09)\,\log_e(116\,361.)$$

$$\log(116\,361.)\,\log(6995.09) = \log^2(a)\,\log_a(6995.09)\,\log_a(116\,361.)$$

$$\log(116\,361.)\log(6995.09) = \mathrm{Li}_1(-116\,360.)\,\mathrm{Li}_1(-6994.09)$$

Series representations:

$$\log(116\,361.)\log(6995.09) = \left(\log(116\,360.) - \sum_{k=1}^{\infty} \frac{(-1)^k\, e^{-11.6644\,k}}{k}\right)\left(\log(6994.09) - \sum_{k=1}^{\infty} \frac{(-1)^k\, e^{-8.85282\,k}}{k}\right)$$

$$\log(116\,361.)\log(6995.09) = \left(2\,i\,\pi\left\lfloor \frac{\arg(6995.09 - x)}{2\,\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(6995.09 - x)^k\, x^{-k}}{k}\right)$$
$$\left(2\,i\,\pi\left\lfloor \frac{\arg(116\,361. - x)}{2\,\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(116\,361. - x)^k\, x^{-k}}{k}\right) \quad \text{for } x < 0$$

$$\log(116\,361.)\log(6995.09) = \left(\left\lfloor \frac{\arg(6995.09 - z_0)}{2\,\pi}\right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(6995.09 - z_0)}{2\,\pi}\right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(6995.09 - z_0)^k\, z_0^{-k}}{k}\right)\left(\left\lfloor \frac{\arg(116\,361. - z_0)}{2\,\pi}\right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(116\,361. - z_0)}{2\,\pi}\right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(116\,361. - z_0)^k\, z_0^{-k}}{k}\right)$$

Integral representations:

$$\log(116\,361.)\log(6995.09) = 1.22875 \times 10^{-9} \int_0^1 \int_0^1 \frac{1}{(0.000142978 + t_1)\left(8.59401 \times 10^{-6} + t_2\right)}\, dt_2\, dt_1$$

$$\log(116\,361.)\log(6995.09) = \frac{\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-11.6644\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right)\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-8.85282\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds}{4\,i^2\,\pi^2} \quad \text{for } -1 < \gamma < 0$$

We have from the difference between the two results:

(116361.059-6995.094752)

Input interpretation:

116 361.059 – 6995.094752

Result:

109365.964248

109365.964248…

From the formula of coefficients of the '5th order' mock theta function $\psi_1(q)$: (A053261 OEIS Sequence)

sqrt(golden ratio) * exp(Pi*sqrt(n/15)) / (2*5^(1/4)*sqrt(n)) for n = 360.491

sqrt(golden ratio) * exp(Pi*sqrt(360.491/15)) / (2*5^(1/4)*sqrt(360.491))

Input interpretation:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{360.491}{15}}\right)}{2\sqrt[4]{5}\sqrt{360.491}}$$

ϕ is the golden ratio

Result:

109366.037428342187016800228705305796479664041779649782396 1…

109366.0374283…

Series representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{360.491}{15}}\right)}{2\sqrt[4]{5}\sqrt{360.491}} = \frac{\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (24.0327-z_0)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (\phi-z_0)^k z_0^{-k}}{k!}}{2\sqrt[4]{5}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (360.491-z_0)^k z_0^{-k}}{k!}}$$

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

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{360.491}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{360.491}} = \left(\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\right.$$
$$\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(24.0327-x)}{2\pi}\right\rfloor\right)\sqrt{x}\ \sum_{k=0}^{\infty}\frac{(-1)^k\,(24.0327-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\,(\phi-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/$$
$$\left(2\sqrt[4]{5}\ \exp\left(i\pi\left\lfloor\frac{\arg(360.491-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(360.491-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{360.491}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{360.491}} = \left(\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\,[\arg(24.0327-z_0)/(2\pi)]}\right.\right.$$
$$\left.z_0^{1/2\,(1+[\arg(24.0327-z_0)/(2\pi)])}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\,(24.0327-z_0)^k\,z_0^{-k}}{k!}\right)$$
$$\left(\frac{1}{z_0}\right)^{-1/2\,[\arg(360.491-z_0)/(2\pi)]+1/2\,[\arg(\phi-z_0)/(2\pi)]}$$
$$\left.z_0^{-1/2\,[\arg(360.491-z_0)/(2\pi)]+1/2\,[\arg(\phi-z_0)/(2\pi)]}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\,(\phi-z_0)^k\,z_0^{-k}}{k!}\right)\Big/$$
$$\left(2\sqrt[4]{5}\ \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\,(360.491-z_0)^k\,z_0^{-k}}{k!}\right)$$

We have also:

(-(20+log(2/3)-exp(3)))

Input:

$$-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$-20+e^3+\log\left(\frac{3}{2}\right)$$

Decimal approximation:

0.491002031295832122906542770046067033559898262016644341992...

0.491002031…

Alternate form:

$$-20 + e^3 - \log(2) + \log(3)$$

Alternative representations:

$$-\left(20 + \log\left(\frac{2}{3}\right) - \exp(3)\right) = -20 + \exp(3) - \log_e\left(\frac{2}{3}\right)$$

$$-\left(20 + \log\left(\frac{2}{3}\right) - \exp(3)\right) = -20 + \exp(3) - \log(a)\log_a\left(\frac{2}{3}\right)$$

Series representations:

$$-\left(20 + \log\left(\frac{2}{3}\right) - \exp(3)\right) = -20 + e^3 - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}$$

$$-\left(20 + \log\left(\frac{2}{3}\right) - \exp(3)\right) =$$
$$-20 + e^3 + 2\,i\,\pi\left\lfloor \frac{\arg\left(\frac{3}{2} - x\right)}{2\,\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{3}{2} - x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$-\left(20 + \log\left(\frac{2}{3}\right) - \exp(3)\right) = -20 + e^3 + \left\lfloor \frac{\arg\left(\frac{3}{2} - z_0\right)}{2\,\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) +$$
$$\log(z_0) + \left\lfloor \frac{\arg\left(\frac{3}{2} - z_0\right)}{2\,\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{3}{2} - z_0\right)^k z_0^{-k}}{k}$$

Integral representations:

$$-\left(20 + \log\left(\frac{2}{3}\right) - \exp(3)\right) = -20 + e^3 + \int_1^{\frac{3}{2}} \frac{1}{t}\,dt$$

$$-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)=-20+e^3-\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{2^s\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

We can write also:

sqrt(golden ratio) * exp(Pi*sqrt((((360+(((-(20+log(2/3)-exp(3)))))))/15)) / (2*5^(1/4)*sqrt(360+(((-(20+log(2/3)-exp(3)))))))

Input:

$$\sqrt{\phi}\times\frac{\exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\,\sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{e^{\pi\sqrt{1/15\left(340+e^3+\log(3/2)\right)}}\sqrt{\frac{\phi}{340+e^3+\log\left(\frac{3}{2}\right)}}}{2\sqrt[4]{5}}$$

Decimal approximation:

109366.041865721990896431156472841910159463535208202928285 5...

109366.0418657…

Alternate forms:

$$\frac{e^{\pi\sqrt{1/15\left(340+e^3+\log(3/2)\right)}}\sqrt{\frac{1+\sqrt{5}}{340+e^3+\log\left(\frac{3}{2}\right)}}}{2\sqrt{2}\,\sqrt[4]{5}}$$

$$\frac{e^{\pi\sqrt{1/15\left(340+e^3-\log(2)+\log(3)\right)}}\sqrt{\frac{\phi}{340+e^3-\log(2)+\log(3)}}}{2\sqrt[4]{5}}$$

Alternative representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}=\frac{\exp\left(\pi\sqrt{\frac{1}{15}\left(340+\exp(3)-\log_e\left(\frac{2}{3}\right)\right)}\right)\sqrt{\phi}}{2\sqrt[4]{5}\sqrt{340+\exp(3)-\log_e\left(\frac{2}{3}\right)}}$$

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}=\frac{\exp\left(\pi\sqrt{\frac{1}{15}\left(340+\exp(3)-\log(a)\log_a\left(\frac{2}{3}\right)\right)}\right)\sqrt{\phi}}{2\sqrt[4]{5}\sqrt{340+\exp(3)-\log(a)\log_a\left(\frac{2}{3}\right)}}$$

Series representations:

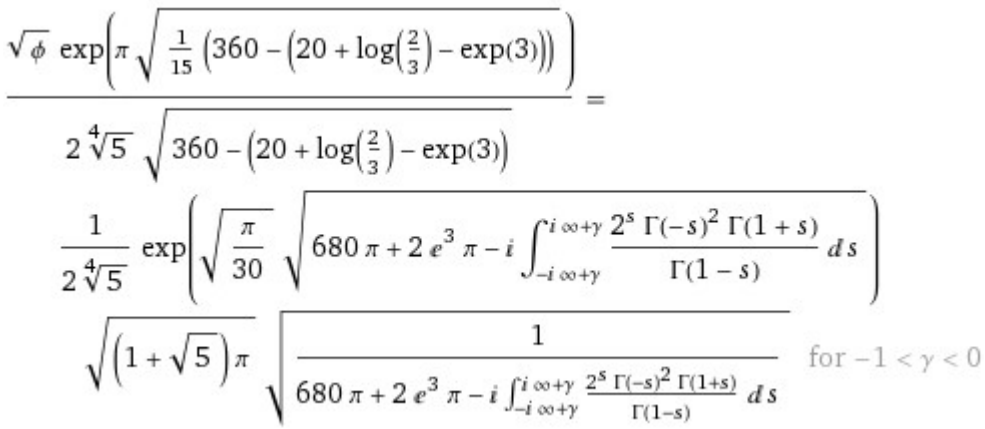
$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}=\frac{\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,e^{\left(\pi\sqrt{340+e^3-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}}\right)/\sqrt{15}}\sqrt{\frac{1}{340+e^3-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}}}}{2\sqrt[4]{5}}$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\ \sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}=\frac{1}{2\sqrt[4]{5}}\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}$$
$$\exp\left(\frac{\pi\sqrt{340+e^3+2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{3}{2}-x\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{3}{2}-x\right)^k x^{-k}}{k}}}{\sqrt{15}}\right)$$
$$\sqrt{\frac{1}{340+e^3+2\,i\,\pi\left\lfloor\frac{\arg\left(\frac{3}{2}-x\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{3}{2}-x\right)^k x^{-k}}{k}}}\quad\text{for } x<0$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\ \sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}=$$
$$\frac{1}{2\sqrt[4]{5}}\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\exp\left(\frac{\pi\sqrt{340+e^3+\sum_{j=1}^{\infty}\operatorname{Res}_{s=-j}\frac{2^s\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}}}{\sqrt{15}}\right)$$
$$\sqrt{\frac{1}{340+e^3+\sum_{j=1}^{\infty}\operatorname{Res}_{s=-j}\frac{2^s\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}}}$$

Integral representations:

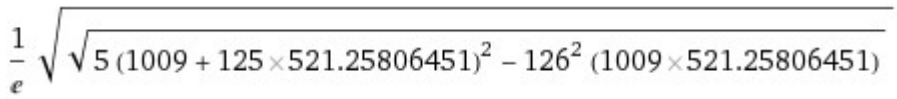
$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{1}{15}\left(360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)\right)}\right)}{2\sqrt[4]{5}\ \sqrt{360-\left(20+\log\left(\frac{2}{3}\right)-\exp(3)\right)}}=$$
$$\frac{\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\ e^{\left(\pi\sqrt{340+e^3+\int_1^{\frac{3}{2}}\frac{1}{t}\,dt}\right)/\sqrt{15}}\sqrt{\frac{1}{340+e^3+\int_1^{\frac{3}{2}}\frac{1}{t}\,dt}}}{2\sqrt[4]{5}}$$



From the principal expression, we obtain also:

1/e * sqrt(sqrt(((5(1009+125*521.25806451)^2-126^2(1009*521.25806451)))))

Input interpretation:

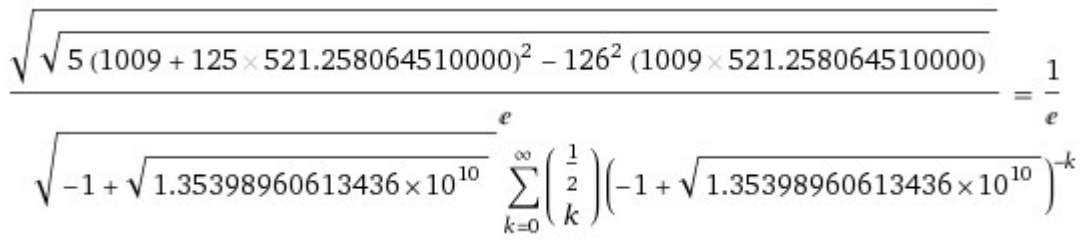


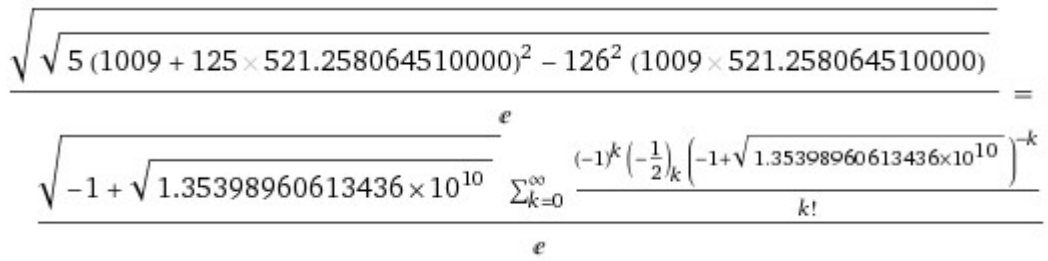
Result:

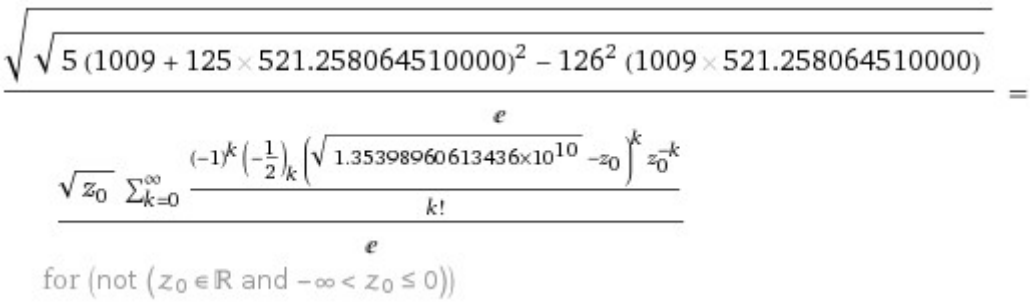
125.49006687...

125.49006687… result very near to the Higgs boson mass 125.18 GeV

Series representations:



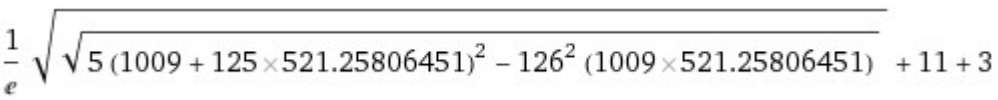




And again:

1/e * sqrt(sqrt(((5(1009+125*521.25806451)^2-126^2(1009*521.25806451))))) + 11+ 3

Input interpretation:

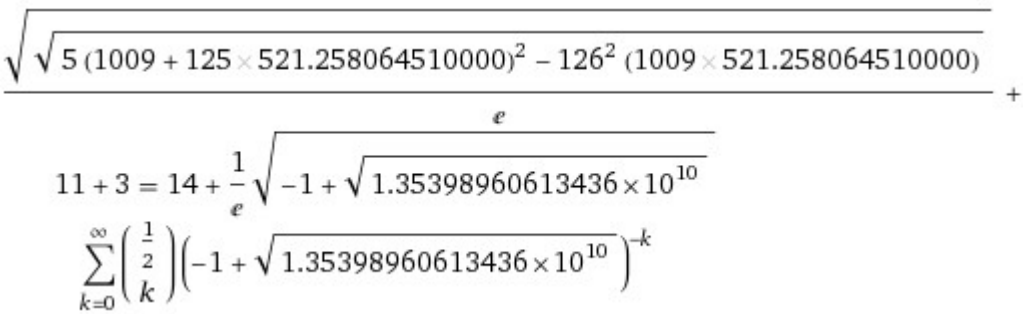


Result:

139.49006687...

139.49006687… result practically equal to the rest mass of Pion meson 139.57 MeV

Series representations:



$$\frac{\sqrt{\sqrt{5\,(1009+125\times 521.258064510000)^2-126^2\,(1009\times 521.258064510000)}}}{e}+$$

$$11+3=14+\frac{\sqrt{-1+\sqrt{1.35398960613436\times 10^{10}}}\ \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(-1+\sqrt{1.35398960613436\times 10^{10}}\right)^{-k}}{k!}}{e}$$

$$\frac{\sqrt{\sqrt{5\,(1009+125\times 521.258064510000)^2-126^2\,(1009\times 521.258064510000)}}}{e}+$$

$$11+3=14+\frac{\sqrt{z_0}\ \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\sqrt{1.35398960613436\times 10^{10}}-z_0\right)^k z_0^{-k}}{k!}}{e}$$

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

27*1/2(((1/e * sqrt(sqrt(((5(1009+125*521.25806451)^2-126^2(1009*521.25806451)))))+golden ratio^2)))

Input interpretation:

$$27\times\frac{1}{2}\left(\frac{1}{e}\sqrt{\sqrt{5\,(1009+125\times 521.25806451)^2-126^2\,(1009\times 521.25806451)}}+\phi^2\right)$$

ϕ is the golden ratio

Result:

1729.4593616...

1729.4593616…

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. 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 $\boldsymbol{Z}/3\boldsymbol{Z}$, and its outer automorphism group is the cyclic group $\boldsymbol{Z}/2\boldsymbol{Z}$. 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:

$$\frac{27}{2}\left(\frac{\sqrt{\sqrt{5\,(1009+125\times521.258064510000)^2-126^2\,(1009\times521.258064510000)}}}{e}+\phi^2\right)=\frac{27\,\phi^2}{2}+\frac{1}{2\,e}27\sqrt{-1+\sqrt{1.35398960613436\times10^{10}}}$$

$$\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\sqrt{1.35398960613436\times10^{10}}\right)^{-k}$$

$$\frac{27}{2}\left(\frac{\sqrt{\sqrt{5\,(1009+125\times521.258064510000)^2-126^2\,(1009\times521.258064510000)}}}{e}+\phi^2\right)=\frac{27\,\phi^2}{2}+\frac{1}{2\,e}27\sqrt{-1+\sqrt{1.35398960613436\times10^{10}}}$$

$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(-1+\sqrt{1.35398960613436\times10^{10}}\right)^{-k}}{k!}$$

$$\frac{27}{2}\left(\frac{1}{e}\left(\sqrt{\left(\sqrt{\left(5\,(1009+125\times521.258064510000)^2-126^2\,(1009\times521.258064510000)\right)}\right)}+\phi^2\right)=\frac{27\,\phi^2}{2}+\frac{27\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\sqrt{1.35398960613436\times10^{10}}-z_0\right)^k z_0^{-k}}{k!}}{2\,e}$$

for $\left(\text{not}\left(z_0\in\mathbb{R}\text{ and }-\infty<z_0\le0\right)\right)$

[27*1/2(((1/e * sqrt(sqrt(((5(1009+125*521.25806451)^2-126^2(1009*521.25806451)))))+golden ratio^2)))]^1/15

Input interpretation:

$$\left(27 \times \frac{1}{2}\left(\frac{1}{e}\sqrt{\sqrt{5\,(1009+125\times 521.25806451)^2-126^2\,(1009\times 521.25806451)}}+\phi^2\right)\right)\text{^}(1/15)$$

ϕ is the golden ratio

Result:

1.64384434045...

$1.64384434045\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Observations

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

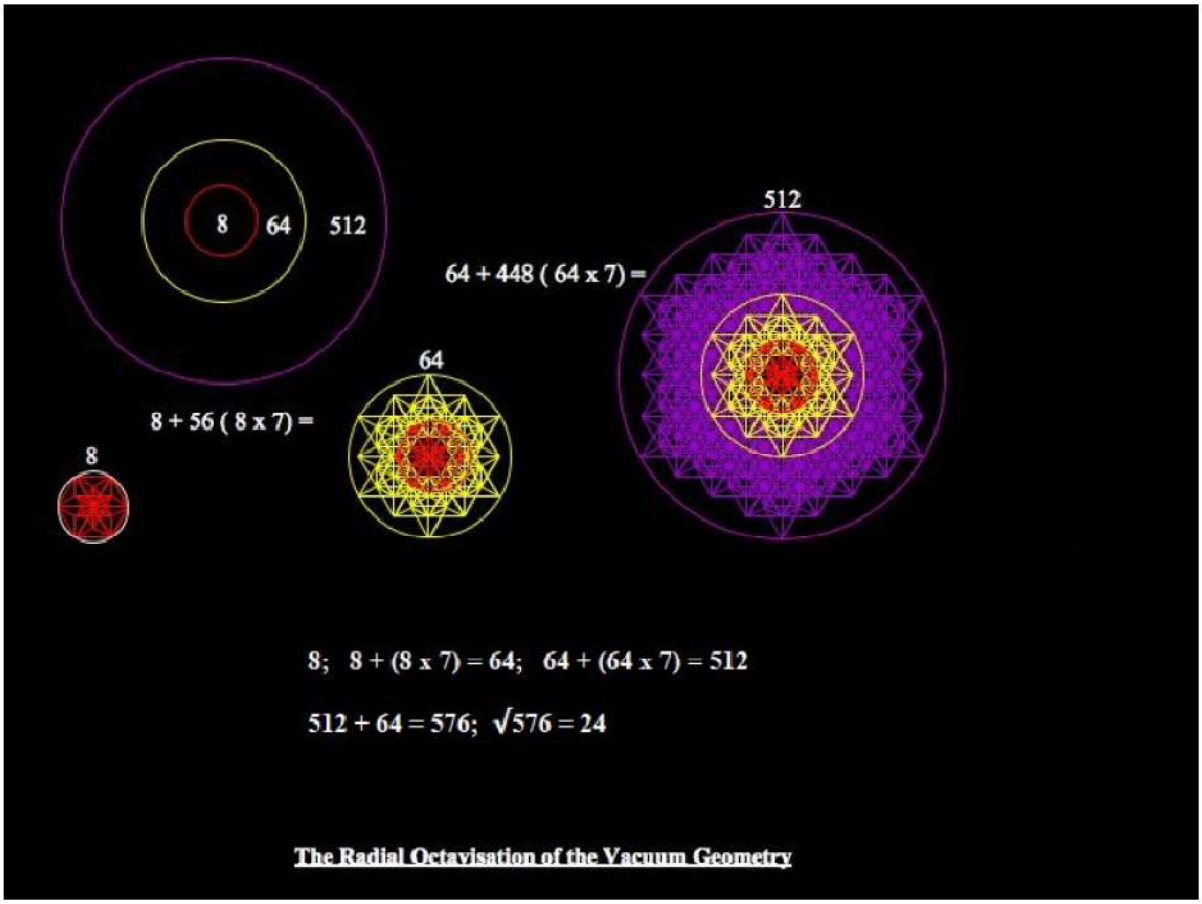
We observe that 1728 and 1729 are results very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. As a consequence, it is sometimes called a Zagier as a pun on the Gross–Zagier theorem. The number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

Furthermore, we obtain as results of our computations, always values very near to the Higgs boson mass 125.18 GeV and practically equals to the rest mass of Pion meson 139.57 MeV. In conclusion we obtain also many results that are very good approximations to the value of the golden ratio 1.618033988749... and to ζ(2) = $\frac{\pi^2}{6} = 1.644934 \ldots$

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.

Fig. 1

https://www.pinterest.it/pin/570338740293422619/



The above figure, show as the vacuum geometry is strongly connected to the value of the golden ratio and that Ramanujan's mathematics, especially that described in paragraph 5 of the wonderful paper "Modular equations and approximations to π ", precisely the equations where there are 64 and 4096, fundamental numbers in the vacuum geometry: everything is strictly linked to the quantum gravity, precisely to the mathematical development of this theory.

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Volume 216, number 1,2 PHYSICS LETTERS B 5 January 1989 - **OPEN STRING ORBIFOLDS** - *Gianfranco PRADISI and Augusto SAGNOTTI* - Dipartimento di Fisica, Universith di Roma II, "'Tor Vergata', Via Orazio Raimondo, 1-00173 Rome, Italy and lNFN, Sezione di Roma, 1-00185 Rome, Italy - Received 11 August 1988

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