On the possible mathematical connections between several equations concerning SUSY Breaking, various parameters concerning Particle Physics, some Ramanujan equations concerning p(n) and τ(n), ϕ and ζ(2). III

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Abstract

In this paper (part III), we describe and analyze further new mathematical connections between several equations concerning SUSY breaking, various parameters concerning Particle Physics, some Ramanujan equations concerning p(n) and τ(n), ϕ and ζ(2).

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From

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We have that:

$$q = e^{2\pi i \tau} \ , \ \tau = \frac{i\tau_2}{2} \ ,$$

$$\theta_1(\epsilon_1 \tau|\tau) \to 2i \sinh\left(\frac{\pi \epsilon_1 \tau_2}{2}\right) q^{1/8} \ ,$$

$$|\epsilon_1| < 1/2.$$

The stacks in the ab-sector intersect in all three tori. In this case, there are no standard Kaluza-Klein sums, but Landau levels in the three tori. The cylinder partition function reads

$$A_{ab} = \frac{I^1_{ab} I^2_{ab} I^3_{ab}}{2(4\pi^2\alpha')^2} \int_0^\infty \frac{d\tau_2}{\tau_2^3} \frac{(V_8 - S_8)(\epsilon_1\tau; \epsilon_2\tau; \epsilon_3\tau|\tau)}{\eta^2} \prod_{i=1}^{3} \frac{2i\eta}{\theta_1(\epsilon_i\tau|\tau)} \ , \qquad (154)$$

which can again be simplified with the help of the Jacobi identity (228),

$$\begin{aligned}(V_8 - S_8)(\epsilon_1\tau; \epsilon_2\tau; \epsilon_3\tau|\tau) &\equiv \frac{\theta_3 \prod_{i=1}^3 \theta_3(\epsilon_i\tau|\tau) - \theta_4 \prod_{i=1}^3 \theta_4(\epsilon_i\tau|\tau) - \theta_2 \prod_{i=1}^3 \theta_2(\epsilon_i\tau|\tau)}{2\eta^4} \\ &= -\frac{1}{\eta^4} \theta_1\Big(\frac{(\epsilon_1+\epsilon_2+\epsilon_3)\tau}{2}\Big|\tau\Big)\theta_1\Big(\frac{(-\epsilon_1+\epsilon_2+\epsilon_3)\tau}{2}\Big|\tau\Big) \\ &\quad \times \theta_1\Big(\frac{(\epsilon_1-\epsilon_2+\epsilon_3)\tau}{2}\Big|\tau\Big)\theta_1\Big(\frac{(\epsilon_1+\epsilon_2-\epsilon_3)\tau}{2}\Big|\tau\Big) \ . \qquad (155)\end{aligned}$$

We put: $\epsilon_1 = -1;\ \epsilon_2 = 1;\ \epsilon_3 = 1;$

$$\theta_1(\epsilon_1 \tau|\tau) \to 2i \sinh\left(\frac{\pi \epsilon_1 \tau_2}{2}\right) q^{1/8} \ ,$$

$$\eta(\tau) = q^{\frac{1}{24}} \prod_{n=1}^{\infty} (1 - q^n) \ ,$$

$$(V_8 - S_8)(\epsilon_1\tau;\epsilon_2\tau;\epsilon_3\tau|\tau) \equiv \frac{\theta_3\prod_{i=1}^3\theta_3(\epsilon_i\tau|\tau) - \theta_4\prod_{i=1}^3\theta_4(\epsilon_i\tau|\tau) - \theta_2\prod_{i=1}^3\theta_2(\epsilon_i\tau|\tau)}{2\eta^4}$$
$$= -\frac{1}{\eta^4}\theta_1\Big(\frac{(c_1 \mid c_2 \mid c_3)\tau}{2}\Big|\tau\Big)\theta_1\Big(\frac{(\ c_1 \mid c_2 \mid c_3)\tau}{2}\Big|\tau\Big)$$
$$\times\, 0_1\Big(\frac{(\epsilon_1 - \epsilon_2 + \epsilon_3)\tau}{2}\Big|\tau\Big)0_1\Big(\frac{(\epsilon_1 + \epsilon_2 - \epsilon_3)\tau}{2}\Big|\tau\Big)\ . \quad (155)$$

$-1/\eta^4$ * (((2*i*sinh(1/2*Pi/2*τ_2)*(exp(Pi*i^2*τ_2))^(1/8)))*
(((2*i*sinh(3/2*Pi/2*τ_2)*(exp(Pi*i^2*τ_2))^(1/8)))* (((2*i*sinh(-1/2*Pi/2*τ_2)*(exp(Pi*i^2*τ_2))^(1/8))) (((2*i*sinh(-1/2*Pi/2*τ_2)*(exp(Pi*i^2*τ_2))^(1/8)))

(exp(Pi*i^2*τ_2))^(1/24) * (1-(exp(Pi*i^2*τ_2)))

-1/η^4 * (((2*i*sinh(1/2*Pi/2)*(exp(Pi*i^2))^(1/8))))*
(((2*i*sinh(3/2*Pi/2)*(exp(Pi*i^2))^(1/8))))* (((2*i*sinh(-1/2*Pi/2)*(exp(Pi*i^2))^(1/8)))) (((2*i*sinh(-1/2*Pi/2)*(exp(Pi*i^2))^(1/8))))

For $\tau_2 = 1$

Input:

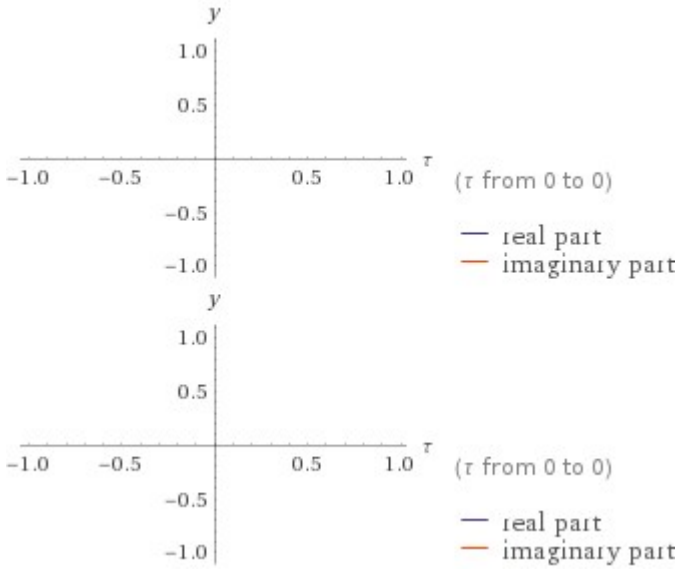
$$-\frac{1}{\eta(\tau)^4}\left(2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(\frac{3}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)$$
$$\left(2\,i\sinh\left(-\frac{\frac{\pi}{2}}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\frac{\pi}{2}}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)$$

$\eta(\tau)$ is the Dedekind eta function
$\sinh(x)$ is the hyperbolic sine function
i is the imaginary unit

Exact result:

$$-\frac{16\,e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)}{\eta(\tau)^4}$$

Plots:



Alternate forms:

$$-\frac{e^{-2\pi}\left(e^{\pi/2}-1\right)^4\left(1+e^{\pi/2}+e^{\pi}\right)}{\eta(\tau)^4}$$

$$-\frac{e^{-\pi/2}\left(e^{\pi/4}-e^{-\pi/4}\right)^3\left(e^{(3\pi)/4}-e^{-(3\pi)/4}\right)}{\eta(\tau)^4}$$

$$-\frac{e^{-2\pi}\left(e^{\pi/4}-1\right)^4\left(1+e^{\pi/4}\right)^4\left(1-e^{\pi/4}+e^{\pi/2}\right)\left(1+e^{\pi/4}+e^{\pi/2}\right)}{\eta(\tau)^4}$$

Series expansion at $\tau = 0$:

$$\frac{16\, e^{(\pi(-3\tau+98i))/(6\tau)}\,\tau^2\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)}{\left(e^{(2i\pi)/\tau}-e^{(4i\pi)/\tau}+1\right)^4}$$

Alternative representations:

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{3\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)\right)\left(2\left(i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)=-\frac{i^4\left(e^{-\pi/4}-e^{\pi/4}\right)^2\left(-e^{-\pi/4}+e^{\pi/4}\right)\left(-e^{-(3\pi)/4}+e^{(3\pi)/4}\right)\sqrt[8]{\exp(\pi\,i^2)}^4}{\eta(\tau)^4}$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{3\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)\right)\left(2\left(i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)=-\frac{16\,i^8\cos^2\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\cos\left(\frac{\pi}{2}+\frac{3\,i\pi}{4}\right)\sqrt[8]{\exp(\pi\,i^2)}^4}{\eta(\tau)^4}$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{3\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)\right)\left(2\left(i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)=-\frac{16\,i^8\cos\left(\frac{\pi}{2}-\frac{3\,i\pi}{4}\right)\cos\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\cos^2\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi\,i^2)}^4}{\eta(\tau)^4}$$

Series representations:

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{3\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)\right)$$
$$2\left(i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)=$$
$$-16\exp\left(-\frac{1}{6}\pi(3+2\,i\,\tau)+4\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2\,i\,k\,n\,\pi\,\tau}}{k}\right)\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{3\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)\right)2$$
$$\left(i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)=-16\exp\left(-\frac{1}{6}\pi(3+2\,i\,\tau)+4\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2\,i\,k\,n\,\pi\,\tau}}{k}\right)$$
$$\left(\sum_{k=0}^{\infty}\frac{\left(\frac{4}{3\pi}\right)^{-1-2k}}{(1+2k)!}\right)\left(\sum_{k=0}^{\infty}\frac{\left(\frac{4}{\pi}\right)^{-1-2k}}{(1+2k)!}\right)^3$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{3\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\right)\right)2$$
$$\left(i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)=-16\exp\left(-\frac{1}{6}\pi(3+2\,i\,\tau)+4\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2\,i\,k\,n\,\pi\,\tau}}{k}\right)$$
$$\left(\sum_{k=0}^{\infty}\frac{\left(\left(\frac{1}{4}-\frac{i}{2}\right)\pi\right)^{2k}}{(2k)!}\right)^3\sum_{k=0}^{\infty}\frac{\left(\left(\frac{3}{4}-\frac{i}{2}\right)\pi\right)^{2k}}{(2k)!}$$

From

$$-\frac{16\,e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)}{\eta(\tau)^4}$$

we obtain, considering n = 1:

-(16 e^(-π/2) sinh^3(π/4) sinh((3 π)/4)) * 1/((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^4

Input:

$$-\left(16\, e^{-\pi/2} \sinh^3\left(\frac{\pi}{4}\right) \sinh\left(\frac{3\pi}{4}\right)\right) \times \frac{1}{\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^4}$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Exact result:

$$-\frac{16\, e^{-\pi/3} \sinh^3\left(\frac{\pi}{4}\right) \sinh\left(\frac{3\pi}{4}\right)}{(1-e^{-\pi})^4}$$

Decimal approximation:

−22.959774946348261886531839375185281860331892798573034133 2...

-22.9597749…

Property:

$$-\frac{16\, e^{-\pi/3} \sinh^3\left(\frac{\pi}{4}\right) \sinh\left(\frac{3\pi}{4}\right)}{(1-e^{-\pi})^4}$$ is a transcendental number

Alternate forms:

$$-\frac{e^{(13\pi)/6}\left(1+e^{\pi/2}+e^{\pi}\right)}{\left(1+e^{\pi/2}\right)^4}$$

$$-\frac{16\, e^{(11\pi)/3} \sinh^3\left(\frac{\pi}{4}\right) \sinh\left(\frac{3\pi}{4}\right)}{\left(e^{\pi/3}-1\right)^4 \left(1+e^{\pi/3}+e^{(2\pi)/3}\right)^4}$$

$$-\frac{e^{-\pi/3}\left(e^{\pi/4}-e^{-\pi/4}\right)^3 \left(e^{(3\pi)/4}-e^{-(3\pi)/4}\right)}{(1-e^{-\pi})^4}$$

Alternative representations:

$$-\frac{16\left(e^{-\pi/2} \sinh^3\left(\frac{\pi}{4}\right) \sinh\left(\frac{3\pi}{4}\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^4} = -\frac{8\, e^{-\pi/2}\left(-e^{-(3\pi)/4}+e^{(3\pi)/4}\right)\left(\frac{1}{2}\left(-e^{-\pi/4}+e^{\pi/4}\right)\right)^3}{\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^4}$$

$$-\frac{16\left(e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^4}=-\frac{16\,i\cos\left(\frac{\pi}{2}+\frac{3i\pi}{4}\right)e^{-\pi/2}\left(i\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\right)^3}{\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^4}$$

$$-\frac{16\left(e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^4}=\frac{16\,i\cos\left(\frac{\pi}{2}-\frac{3i\pi}{4}\right)e^{-\pi/2}\left(-i\cos\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\right)^3}{\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^4}$$

Series representations:

$$-\frac{16\left(e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^4}=-\frac{12\,e^{(11\pi)/3}\sinh\left(\frac{3\pi}{4}\right)\sum_{k=1}^{\infty}\frac{\left(-1+\phi^k\right)\left(\frac{4}{\pi}\right)^{-1-2k}}{(1+2k)!}}{(-1+e^{\pi})^4}$$

$$-\frac{16\left(e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^4}=\frac{4\,i\,e^{(11\pi)/3}\sinh\left(\frac{3\pi}{4}\right)\sum_{k=0}^{\infty}\frac{\left(3+\phi^k\right)\left(\left(\frac{1}{4}-\frac{i}{2}\right)\pi\right)^{2k}}{(2k)!}}{(-1+e^{\pi})^4}$$

$$-\frac{16\left(e^{-\pi/2}\sinh^3\left(\frac{\pi}{4}\right)\sinh\left(\frac{3\pi}{4}\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^4}=$$

$$-\frac{e^{(11\pi)/3}\,\pi^3\sinh\left(\frac{3\pi}{4}\right)\sum_{k=0}^{1}(-1)^k\,(3-2k)^3\binom{3}{k}\,{}_1F_2\left(1;\,2,\,\frac{5}{2};\,\frac{1}{64}(3-2k)^2\pi^2\right)}{96\,(-1+e^{\pi})^4}$$

From

$$A_{ab}=\frac{I^1_{ab}I^2_{ab}I^3_{ab}}{2(4\pi^2\alpha')^2}\int_0^\infty\frac{d\tau_2}{\tau_2^3}\frac{(V_8-S_8)(\epsilon_1\tau;\epsilon_2\tau;\epsilon_3\tau|\tau)}{\eta^2}\prod_{i=1}^{3}\frac{2i\eta}{\theta_1(\epsilon_i\tau|\tau)}\ ,$$

$$\theta_1(\epsilon_1\tau|\tau)\to 2i\sinh\left(\frac{\pi\epsilon_1\tau_2}{2}\right)q^{1/8}\ ,$$

-22.9597749 / (((((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^2))) *
(((2*((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))))) /
(((((2*i*sinh(1/2*Pi/2)*(exp(Pi*i^2))^(1/8))))))

Input interpretation:

$$-\frac{22.9597749}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}\times\frac{2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)}{2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}}$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

46.6330190... i

Polar coordinates:

$r = 46.633$ (radius), $\theta = 90°$ (angle)

46.633

Alternative representations:

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}=-\frac{45.9195\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}=-\frac{45.9195\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}=\frac{-45.9195\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(-2\,i^2\cos\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

Series representations:

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{11.4799}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \sum_{k=0}^{\infty} I_{1+2k}\left(\frac{\pi}{4}\right)}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{22.9598}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \sum_{k=0}^{\infty} \frac{4^{-1-2k}\,\pi^{1+2k}}{(1+2k)!}}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{22.9598}{i\,\mathcal{A}\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \sum_{k=0}^{\infty} \frac{4^{-2k}\,(\pi-2\pi\,\mathcal{A})^{2k}}{(2k)!}}$$

Integral representations:

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{91.8391}{i\,\pi\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \int_0^1 \cosh\left(\frac{\pi t}{4}\right)dt}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{367.356\,\mathcal{A}}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \sqrt{\pi}\ \int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma} \frac{e^{\pi^2/(64\,s)+s}}{s^{3/2}}\,ds} \quad \text{for } \gamma > 0$$

From the right hand-side of

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-22.9598)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} =$$
$$-\frac{45.9195\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

performing the integral, we obtain:

1/(2(4*Pi^2*0.9568666373)^2) integrate [-(45.9195 (1 - exp(π i^2)) exp(π i^2)^(1/24))/((i (-e^(-π/4) + e^(π/4)) exp(π i^2)^(1/8)) ((1 - exp(π i^2)) exp(π i^2)^(1/24))^2)]x

Input interpretation:

$$\frac{1}{2\,(4\,\pi^2\times 0.9568666373)^2}\int -\frac{45.9195\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}\,x\,dx$$

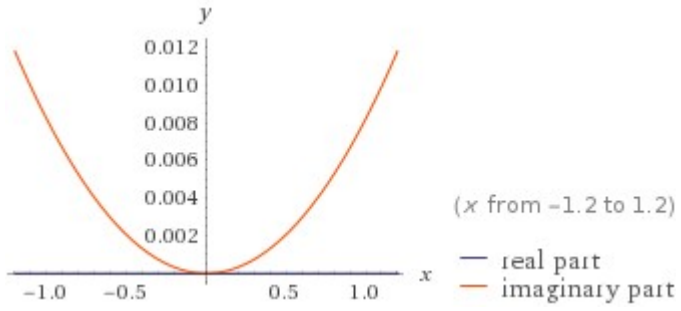
i is the imaginary unit

Result:

$(0.00816979\,i)\,x^2$

0.00816979i

Plot:



Alternate form assuming x is real:

$0 + i\,(0.00816979\,x^2 + 0)$

We note that:

1/(0.00816979 i)-3i (for x = 1)

Input interpretation:

$$\frac{1}{0.00816979\,i} - 3\,i$$

i is the imaginary unit

Result:

$$-0$$
$$125.402...\,i$$

Polar coordinates:

$r = 125.402$ (radius), $\theta = -90°$ (angle)

125.402 result very near to the Higgs boson mass 125.18 GeV

If we take only:

$$\frac{(V_8 - S_8)(\epsilon_1\tau; \epsilon_2\tau; \epsilon_3\tau|\tau)}{\eta^2} \prod_{i=1}^{3} \frac{2i\eta}{\theta_1(\epsilon_i\tau|\tau)}$$

That is equal to:

$$-\frac{22.9597749}{\left(\sqrt[24]{\exp(\pi\,i^2)}\,(1-\exp(\pi\,i^2))\right)^2} \times \frac{2\left(\sqrt[24]{\exp(\pi\,i^2)}\,(1-\exp(\pi\,i^2))\right)}{2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}} = 46.633$$

we obtain:

3[-22.9597749 / (((((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^2))) *
(((2*((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2)))))))))) /
(((((2*i*sinh(1/2*Pi/2)*(exp(Pi*i^2))^(1/8)))))))]

Input interpretation:

$$3\left(-\frac{22.9597749}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}\times\frac{2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)}{2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}}\right)$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

$139.899057\ldots\,i$

Polar coordinates:

$r = 139.899$ (radius), $\theta = 90°$ (angle)

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

Alternative representations:

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)} = -\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)} = -\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)} = \frac{-137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(-2\,i^2\cos\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

Series representations:

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)} = \frac{34.4397}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty} I_{1+2\,k}\left(\frac{\pi}{4}\right)}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)} = \frac{68.8793}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}\frac{4^{-1-2\,k}\,\pi^{1+2\,k}}{(1+2\,k)!}}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)} = \frac{68.8793}{i\,\mathcal{A}\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}\frac{4^{-2\,k}\,(\pi-2\,\pi\,\mathcal{A})^{2\,k}}{(2\,k)!}}$$

Integral representations:

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)} = \frac{275.517}{i\,\pi\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\;\int_0^1\cosh\left(\frac{\pi\,t}{4}\right)dt}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)} = \frac{1102.07\,\mathcal{A}}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\;\sqrt{\pi}\;\int_{-\mathcal{A}\,\infty+\gamma}^{\mathcal{A}\,\infty+\gamma}\frac{e^{\pi^2/(64\,s)+s}}{s^{3/2}}\,ds} \quad \text{for } \gamma > 0$$

3[-22.9597749 / (((((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^2))) *
(((2*((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2)))))))) /
((((((2*i*sinh(1/2*Pi/2)*(exp(Pi*i^2))^(1/8))))))]-18i+4i

Input interpretation:

$$3\left(-\frac{22.9597749}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}\times\frac{2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)}{2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}}\right)-18\,i+4\,i$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

125.899057... i

Polar coordinates:

$r = 125.899$ (radius), $\theta = 90°$ (angle)

125.899 result very near to the Higgs boson mass 125.18 GeV

Alternative representations:

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i-\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i-\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i--\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

Series representations:

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i+\frac{34.4397}{i\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}I_{1+2\,k}\left(\frac{\pi}{4}\right)}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i+\frac{68.8793}{i\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}\frac{4^{-1-2\,k}\,\pi^{1+2\,k}}{(1+2\,k)!}}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i+\frac{68.8793}{i\,\mathcal{A}\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}\frac{4^{-2\,k}\,(\pi-2\,\pi\,\mathcal{A})^{2\,k}}{(2\,k)!}}$$

Integral representations:

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i+\frac{275.517}{i\,\pi\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\int_0^1\cosh\left(\frac{\pi\,t}{4}\right)dt}$$

$$\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}-i\,18+4\,i=$$
$$-14\,i+\frac{1102.07\,\mathcal{A}}{i\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sqrt{\pi}\;\int_{-\mathcal{A}\,\infty+\gamma}^{\mathcal{A}\,\infty+\gamma}\frac{e^{\pi^2/(64\,s)+s}}{s^{3/2}}\,ds}\quad\text{for}\ \gamma>0$$

$\cosh(x)$ is the hyperbolic cosine function

12((((3[-22.9597749 / (((((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^2))) *
(((2*((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2)))))))) /
(((((2*i*sinh(1/2*Pi/2)*(exp(Pi*i^2))^(1/8))))))]+5i))))-11i

Input interpretation:

$$12\left(3\left(-\frac{22.9597749}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2}\times\frac{2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)}{2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}}\right)+5\,i\right)-11\,i$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

1727.78868... i

Polar coordinates:

$r = 1727.79$ (radius), $\theta = 90°$ (angle)

$1727.79 \approx 1728$

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:

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times2}\right)\sqrt[8]{\exp(\pi i^2)}\right)}+5\,i\right)-i\,11=$$

$$-11\,i+12\left(5\,i-\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}\right)$$

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi i^2)}\,(1-\exp(\pi i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times2}\right)\sqrt[8]{\exp(\pi i^2)}\right)}+5\,i\right)-i\,11=$$

$$-11\,i+12\left(5\,i-\frac{137.759\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}\right)$$

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}+5\,i\right)-i\,11=$$
$$-11\,i+12\left(5\,i--\frac{137.759\,(1-\exp(\pi\,i^2))\sqrt[24]{\exp(\pi\,i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}-\frac{i\,\pi}{4}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left((1-\exp(\pi\,i^2))\sqrt[24]{\exp(\pi\,i^2)}\right)^2}\right)$$

Series representations:

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}+5\,i\right)-i\,11=$$
$$49\,i+\frac{413.276}{i\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}I_{1+2\,k}\left(\frac{\pi}{4}\right)}$$

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}+5\,i\right)-i\,11=$$
$$49\,i+\frac{826.552}{i\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}\frac{4^{-1-2\,k}\,\pi^{1+2\,k}}{(1+2\,k)!}}$$

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}+5\,i\right)-i\,11=$$
$$49\,i+\frac{826.552}{i\,\mathcal{A}\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sum_{k=0}^{\infty}\frac{4^{-2\,k}\,(\pi-2\,\pi\,\mathcal{A})^{2\,k}}{(2\,k)!}}$$

Integral representations:

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}+5\,i\right)-i\,11=$$
$$49\,i+\frac{3306.21}{i\,\pi\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\int_0^1\cosh\left(\frac{\pi\,t}{4}\right)dt}$$

$$12\left(\frac{3\,(-22.9598)\left(2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)\right)}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)}+5\,i\right)-i\,11=$$
$$49\,i+\frac{13\,224.8\,\mathcal{A}}{i\left(-1+\exp(i^2\,\pi)\right)\sqrt[6]{\exp(i^2\,\pi)}\;\sqrt{\pi}\;\int_{-\mathcal{A}\,\infty+\gamma}^{\mathcal{A}\,\infty+\gamma}\frac{e^{\pi^2/(64\,s)+s}}{s^{3/2}}\,ds}\quad\text{for }\gamma>0$$

$\cosh(x)$ is the hyperbolic cosine function

(((((12((((3[-22.9597749/(((((((exp(Pi*i^2))^(1/24)(1-(exp(Pi*i^2))))))^2)))
(((2*((((exp(Pi*i^2))^(1/24)(1-
(exp(Pi*i^2)))))))))/(((((2*i*sinh(1/2*Pi/2)(exp(Pi*i^2))^(1/8))))))]+5i))))-
11i)))))^1/15

Input interpretation:

$$\sqrt[15]{12\left(3\left(-\frac{22.9597749}{\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)^2}\times\frac{2\left(\sqrt[24]{\exp(\pi\,i^2)}\;(1-\exp(\pi\,i^2))\right)}{2\,i\sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}}\right)+5\,i\right)-11\,i}$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

1.634733857... +
0.1718174519... i

Polar coordinates:

$r = 1.64374$ (radius), $\theta = 6°$ (angle)

$1.64374 \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

For

$$(\hat{\epsilon}_1, \hat{\epsilon}_2, \hat{\epsilon}_3) = (0.04, 0.07, -0.1)$$

From

$$-\frac{1}{\eta^4}\theta_1\left(\frac{(\epsilon_1+\epsilon_2+\epsilon_3)\tau}{2}\middle|\tau\right)\theta_1\left(\frac{(-\epsilon_1+\epsilon_2+\epsilon_3)\tau}{2}\middle|\tau\right)$$
$$\times\,\theta_1\left(\frac{(\epsilon_1-\epsilon_2+\epsilon_3)\tau}{2}\middle|\tau\right)\theta_1\left(\frac{(\epsilon_1+\epsilon_2-\epsilon_3)\tau}{2}\middle|\tau\right)\,.$$

We obtain:

-1/η^4 * (((2*i*sinh(0.005*Pi/2)*(exp(Pi*i^2))^(1/8))))* (((2*i*sinh(-0.035*Pi/2)*(exp(Pi*i^2))^(1/8))))* (((2*i*sinh(-0.065*Pi/2)*(exp(Pi*i^2))^(1/8)))) (((2*i*sinh(0.105*Pi/2)*(exp(Pi*i^2))^(1/8))))

Input:

$$-\frac{1}{\eta(\tau)^4}\left(2\,i\sinh\left(0.005\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(-0.035\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)$$
$$\left(2\,i\sinh\left(-0.065\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left(2\,i\sinh\left(0.105\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)$$

$\eta(\tau)$ is the Dedekind eta function

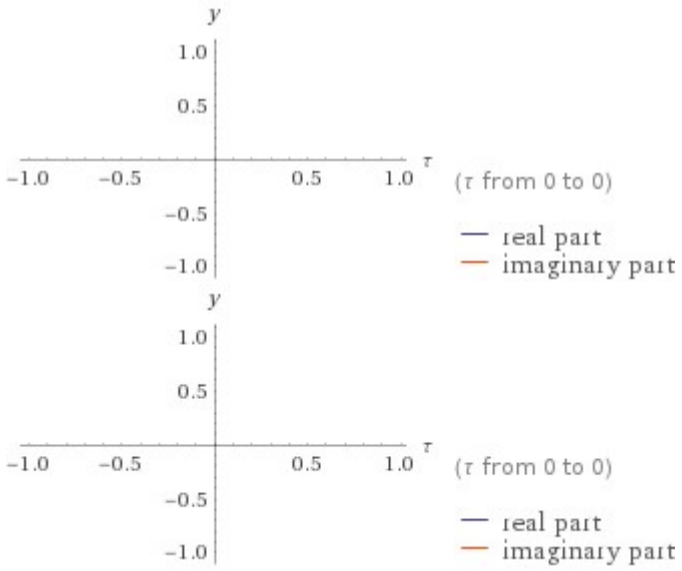
$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

$$-\frac{0.0000243499+0\,i}{\eta(\tau)^4}$$

Plots:



Alternate form:

$$-\frac{0.0000243499}{\eta(\tau)^4}$$

Series expansion at τ = 0:

$$\frac{0.0000243499\, e^{(49\, i\, \pi)/(3\, \tau)}\, \tau^2}{\left(-e^{(2\, i\, \pi)/\tau}+e^{(4\, i\, \pi)/\tau}-1\right)^4}$$

Alternative representations:

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\, i \sinh\left(\frac{1}{2}(-0.035)\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\left(\left(2\, i \sinh\left(\frac{1}{2}(-0.065)\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\left(2\, i \sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\right)\right)$$

$$2\left(i \sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}\right)=-\frac{1}{\eta(\tau)^4}\, i^4\left(-e^{-0.0025\,\pi}+e^{0.0025\,\pi}\right)$$

$$\left(e^{-0.0175\,\pi}-e^{0.0175\,\pi}\right)\left(e^{-0.0325\,\pi}-e^{0.0325\,\pi}\right)\left(-e^{-0.0525\,\pi}+e^{0.0525\,\pi}\right)\sqrt[8]{\exp(\pi\, i^2)}^4$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\, i \sinh\left(\frac{1}{2}(-0.035)\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\left(\left(2\, i \sinh\left(\frac{1}{2}(-0.065)\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\left(2\, i \sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\right)\right)$$

$$2\left(i \sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}\right)=-\frac{1}{\eta(\tau)^4}\, 16\, i^8 \cos\left(\frac{\pi}{2}-0.0525\, i\,\pi\right)$$

$$\cos\left(\frac{\pi}{2}-0.0025\, i\,\pi\right)\cos\left(\frac{\pi}{2}+0.0175\, i\,\pi\right)\cos\left(\frac{\pi}{2}+0.0325\, i\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}^4$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\, i \sinh\left(\frac{1}{2}(-0.035)\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\left(\left(2\, i \sinh\left(\frac{1}{2}(-0.065)\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\left(2\, i \sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}\right)\right)\right)$$

$$2\left(i \sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}\right)=-\frac{1}{\eta(\tau)^4}\, 16\, i^8 \cos\left(\frac{\pi}{2}-0.0325\, i\,\pi\right)$$

$$\cos\left(\frac{\pi}{2}-0.0175\, i\,\pi\right)\cos\left(\frac{\pi}{2}+0.0025\, i\,\pi\right)\cos\left(\frac{\pi}{2}+0.0525\, i\,\pi\right)\sqrt[8]{\exp(\pi\, i^2)}^4$$

Series representations:

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.035)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.065)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(2\,i\sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\right)\right)2\left(i\sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)=-0.0000243499\exp\left(-\frac{1}{3}\,i\pi\tau+4\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2ikn\pi\tau}}{k}\right)$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.035)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.065)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(2\,i\sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\right)\right)2\left(i\sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)=-0.0000243499\left(\sum_{k=0}^{\infty}e^{2i(-1/24+k)\pi\tau}\,p(k)\right)^4$$

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.035)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.065)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(2\,i\sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\right)\right)2\left(i\sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)=-\frac{0.0000243499\,e^{-1/3\,i\pi\tau}}{\left(\sum_{k=-\infty}^{\infty}(-1)^k\,e^{ik(-1+3k)\pi\tau}\right)^4}$$

Integral representation:

$$-\frac{1}{\eta(\tau)^4}\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.035)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\left(2\,i\sinh\left(\frac{1}{2}(-0.065)\pi\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(2\,i\sinh\left(\frac{0.105\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\right)\right)2\left(i\sinh\left(\frac{0.005\,\pi}{2}\right)\sqrt[8]{\exp(\pi i^2)}\right)=-0.0000699104\exp\left(-\frac{4\,i}{\pi}\int_i^{\tau}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)$$

From

$$-\frac{0.0000243499}{\eta(\tau)^4}$$

-0.0000243499/η(τ)^4

-0.0000243499 * 1/((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^4

Input interpretation:

$$-0.0000243499 \times \frac{1}{\left(\sqrt[24]{\exp(\pi\, i^2)}\ (1-\exp(\pi\, i^2))\right)^4}$$

i is the imaginary unit

Result:

−0.0000490494…

-0.0000490494…

-0.0000490494 / (((((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2))))))^2))) *
(((2*((((exp(Pi*i^2))^(1/24)*(1-(exp(Pi*i^2)))))))))) /
(((((2*i*sinh(1/2*Pi/2)*(exp(Pi*i^2))^(1/8))))))

Input interpretation:

$$-\frac{0.0000490494}{\left(\sqrt[24]{\exp(\pi\, i^2)}\ (1-\exp(\pi\, i^2))\right)^2} \times \frac{2\left(\sqrt[24]{\exp(\pi\, i^2)}\ (1-\exp(\pi\, i^2))\right)}{2\, i\, \sinh\left(\frac{1}{2}\times\frac{\pi}{2}\right)\sqrt[8]{\exp(\pi\, i^2)}}$$

$\sinh(x)$ is the hyperbolic sine function

i is the imaginary unit

Result:

0.0000996230… i

Polar coordinates:

$r = 0.000099623$ (radius), $\theta = 90°$ (angle)

0.000099623

Alternative representations:

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = -\frac{0.0000980988\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = -\frac{0.0000980988\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(2\,i^2\cos\left(\frac{\pi}{2}+\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{-0.0000980988\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(-2\,i^2\cos\left(\frac{\pi}{2}-\frac{i\pi}{4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

Series representations:

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{0.0000245247}{i\,(-1+\exp(i^2\pi))\sqrt[6]{\exp(i^2\pi)}\ \sum_{k=0}^{\infty} I_{1+2k}\left(\frac{\pi}{4}\right)}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{0.0000490494}{i\,(-1+\exp(i^2\pi))\sqrt[6]{\exp(i^2\pi)}\ \sum_{k=0}^{\infty}\frac{4^{-1-2k}\pi^{1+2k}}{(1+2k)!}}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{0.0000490494}{i\,\mathcal{A}\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \sum_{k=0}^{\infty}\frac{4^{-2k}\,(\pi-2\,\pi\,\mathcal{A})^{2k}}{(2k)!}}$$

Integral representations:

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{0.000196198}{i\,\pi\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \int_0^1\cosh\left(\frac{\pi t}{4}\right)dt}$$

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = \frac{0.00078479\,\mathcal{A}}{i\,(-1+\exp(i^2\,\pi))\sqrt[6]{\exp(i^2\,\pi)}\ \sqrt{\pi}\ \int_{-\mathcal{A}\,\infty+\gamma}^{\mathcal{A}\,\infty+\gamma}\frac{e^{\pi^2/(64\,s)+s}}{s^{3/2}}\,ds} \quad \text{for } \gamma > 0$$

$\cosh(x)$ is the hyperbolic cosine function

From the right hand-side of

$$\frac{\left(2\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)\right)(-0.0000490494)}{\left(2\,i\sinh\left(\frac{\pi}{2\times 2}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left(\sqrt[24]{\exp(\pi i^2)}\ (1-\exp(\pi i^2))\right)^2} = -\frac{0.0000980988\,(1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi i^2)}\right)\left((1-\exp(\pi i^2))\sqrt[24]{\exp(\pi i^2)}\right)^2}$$

Performing the integral, we obtain:

1/(2(4*Pi^2*0.9568666373)^2) integrate [-(0.0000980988 (1 - exp(π i^2)) exp(π i^2)^(1/24))/((i (-e^(-π/4) + e^(π/4)) exp(π i^2)^(1/8)) ((1 - exp(π i^2)) exp(π i^2)^(1/24))^2)]x

Input interpretation:

$$\frac{1}{2\,(4\,\pi^2 \times 0.9568666373)^2} \int -\frac{0.0000980988\,(1-\exp(\pi\,i^2))\,\sqrt[24]{\exp(\pi\,i^2)}}{\left(i\left(-e^{-\pi/4}+e^{\pi/4}\right)\sqrt[8]{\exp(\pi\,i^2)}\right)\left((1-\exp(\pi\,i^2))\,\sqrt[24]{\exp(\pi\,i^2)}\right)^2}\,x\,dx$$

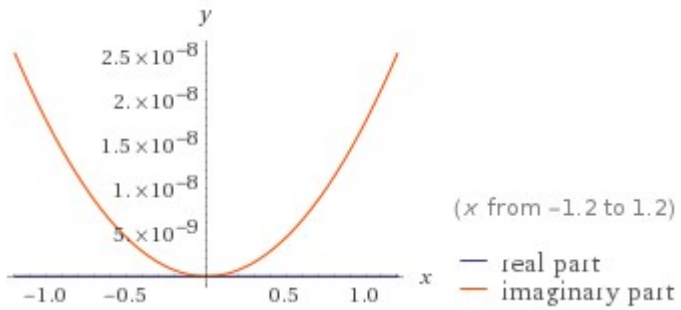
i is the imaginary unit

Result:

$(1.74533\times10^{-8}\,i)\,x^2$

1.74533*10^-8 i

Plot:



Alternate form assuming x is real:

$0 + i\,(1.74533\times10^{-8}\,x^2 + 0)$

From which:

1/((1.74533×10^-8 i))

Input interpretation:

$$\frac{1}{1.74533\times10^{-8}\,i}$$

i is the imaginary unit

Result:

-0

$5.72958... \times 10^7\, i$

Polar coordinates:

$r = 5.72958 \times 10^7$ (radius), $\theta = -90°$ (angle)

$5.72958*10^7$

and:

1/3((((1/((1.74533×10^-8 i))))))^1/3-Pi

Input interpretation:

$$\frac{1}{3}\sqrt[3]{\frac{1}{1.74533 \times 10^{-8}\, i}} - \pi$$

i is the imaginary unit

Result:

$108.147... -$
$64.2524...\, i$

Polar coordinates:

$r = 125.794$ (radius), $\theta = -30.7155°$ (angle)

125.794 result very near to the Higgs boson mass 125.18 GeV

1/3((((1/((1.74533×10^-8 i))))))^1/3-18i-2i

Input interpretation:

$$\frac{1}{3}\sqrt[3]{\frac{1}{1.74533 \times 10^{-8}\, i}} - 18\, i - 2\, i$$

i is the imaginary unit

Result:

$111.2885... -$
$84.25243...\, i$

Polar coordinates:

$r = 139.584$ (radius), $\theta = -37.128°$ (angle)

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

27*1/2(((1/3((((1/((1.74533×10^-8 i))))))^1/3)))+13i

Input interpretation:

$$27 \times \frac{1}{2}\left(\frac{1}{3}\sqrt[3]{\frac{1}{1.74533 \times 10^{-8}\, i}}\right) + 13\, i$$

i is the imaginary unit

Result:

1502.39... −
854.408... i

Polar coordinates:

$r = 1728.35$ (radius), $\theta = -29.6268°$ (angle)

1728.35

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

((((27*1/2(((1/3((((1/((1.74533×10^-8 i))))))^1/3)))+13i))))^1/15

Input interpretation:

$$\sqrt[15]{27\times\frac{1}{2}\left(\frac{1}{3}\sqrt[3]{\frac{1}{1.74533\times10^{-8}\,i}}\right)+13\,i}$$

i is the imaginary unit

Result:

1.6427976... −
0.056653489... i

Polar coordinates:

$r = 1.64377$ (radius), $\theta = -1.97512°$ (angle)

$1.64377 \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Note that, we obtain also:

-((1.74533*10^-8 i)*(0.69897*1.7848))i

Input interpretation:

$$-\left(\left(1.74533\times10^{-8}\,i\right)(0.69897\times1.7848)\right)i$$

i is the imaginary unit

Result:

$2.17733697186648\times10^{-8}$

2.17733697186648*10^-8 result very near to the value of Planck mass

2.176435×10^{-8} kg

From:

An update on moduli stabilization with antibrane uplift
Emilian Dudas and Severin Lust - arXiv:1912.09948v2 [hep-th] 27 Jan 2020

We have that:

for small fluxes. For example, close to the critical value (3.13) and in the case of stringy instantons $a = 2\pi$, (3.17) gives roughly $Z_0 \ll g_s^{3/4}/(3\rho_0)^{3/2}$. Since

$$\frac{2\pi K}{g_s M} = \frac{2\pi M K}{g_s M^2} \leq \frac{2\pi |Q_3^{\rm loc}|}{(6.8)^2} \ , \tag{3.18}$$

a given value of the warp factor translates into a minimum value of the localized D3 charge $Q_3^{\rm loc}$, according to

$$|Q_3^{\rm loc}| \geq \frac{(6.8)^2}{2\pi} |\log Z_0| \ . \tag{3.19}$$

For example, typical KKLT values $\rho_0 \sim 20 - 50$ and for $\Lambda_0 \sim M_P$ imply $Z_0 < 10^{-2}$ to satisfy (3.17),which would imply $|Q_3^{\rm loc}| \geq 40 - 50$. As another example, the gravitino mass is given by

$$m_{3/2} \simeq \frac{W_0}{(\rho_0 + \bar{\rho}_0)^{3/2}} \sim \frac{\epsilon_0 Y_0^2}{\rho_0} \ , \tag{3.20}$$

where the last estimate is order of magnitude only. TeV values of the gravitino mass $m_{3/2} \sim$ TeV would require $Z_0 \sim 10^{-21}$, which translates into $|Q_3^{\rm loc}| \geq 350 - 400$. Whereas this is

From (3.19):

(6.8)^2 / (2Pi) * ln(16^-2)

Input:

$$\frac{6.8^2}{2\pi} \log\left(\frac{1}{16^2}\right)$$

$\log(x)$ is the natural logarithm

Result:

−40.8088...

-40.8088…

Alternative representations:

$$\frac{\log\left(\frac{1}{16^2}\right) 6.8^2}{2\pi} = \frac{\log_e\left(\frac{1}{16^2}\right) 6.8^2}{2\pi}$$

$$\frac{\log\left(\frac{1}{16^2}\right) 6.8^2}{2\pi} = \frac{\log(a) \log_a\left(\frac{1}{16^2}\right) 6.8^2}{2\pi}$$

$$\frac{\log\left(\frac{1}{16^2}\right) 6.8^2}{2\pi} = -\frac{\text{Li}_1\left(1 - \frac{1}{16^2}\right) 6.8^2}{2\pi}$$

Series representations:

$$\frac{\log\left(\frac{1}{16^2}\right)6.8^2}{2\pi} = -\frac{23.12\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{255}{256}\right)^k}{k}}{\pi}$$

$$\frac{\log\left(\frac{1}{16^2}\right)6.8^2}{2\pi} = 46.24\,i\left\lfloor\frac{\arg\left(\frac{1}{256}-x\right)}{2\pi}\right\rfloor + \frac{23.12\log(x)}{\pi} - \frac{23.12\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{256}-x\right)^k x^{-k}}{k}}{\pi}$$

for $x < 0$

$$\frac{\log\left(\frac{1}{16^2}\right)6.8^2}{2\pi} =$$
$$46.24\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{1}{256\,z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor + \frac{23.12\log(z_0)}{\pi} - \frac{23.12\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{256}-z_0\right)^k z_0^{-k}}{k}}{\pi}$$

Integral representation:

$$\frac{\log\left(\frac{1}{16^2}\right)6.8^2}{2\pi} = \frac{23.12}{\pi}\int_1^{\frac{1}{256}}\frac{1}{t}\,dt$$

For:

$$Z_0 \sim 10^{-21}$$

we obtain:

(6.8)^2 / (2Pi) * ln(10^-21)

Input:

$$\frac{6.8^2}{2\pi}\log\left(\frac{1}{10^{21}}\right)$$

$\log(x)$ is the natural logarithm

Result:

−355.855...

-355.855…

Alternative representations:

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = \frac{\log_e\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi}$$

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = \frac{\log(a)\log_a\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi}$$

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = -\frac{\mathrm{Li}_1\left(1-\frac{1}{10^{21}}\right)6.8^2}{2\pi}$$

Series representations:

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = -\frac{23.12\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{999\,999\,999\,999\,999\,999\,999}{1\,000\,000\,000\,000\,000\,000\,000}\right)^k}{k}}{\pi}$$

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = 46.24\,i\left\lfloor\frac{\arg\left(\frac{1}{1\,000\,000\,000\,000\,000\,000\,000}-x\right)}{2\pi}\right\rfloor + \frac{23.12\log(x)}{\pi} - \frac{23.12\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{1\,000\,000\,000\,000\,000\,000\,000}-x\right)^k x^{-k}}{k}}{\pi} \quad \text{for } x<0$$

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = 46.24\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{1}{1\,000\,000\,000\,000\,000\,000\,000\,z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor + \frac{23.12\log(z_0)}{\pi} - \frac{23.12\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{1\,000\,000\,000\,000\,000\,000\,000}-z_0\right)^k z_0^{-k}}{k}}{\pi}$$

Integral representation:

$$\frac{\log\left(\frac{1}{10^{21}}\right)6.8^2}{2\pi} = \frac{23.12}{\pi}\int_1^{\frac{1}{1\,000\,000\,000\,000\,000\,000\,000}}\frac{1}{t}\,dt$$

From

$$\frac{2\pi K}{g_s M} = \frac{2\pi M K}{g_s M^2} \leq \frac{2\pi|Q_3^{\mathrm{loc}}|}{(6.8)^2}$$

we obtain:

2Pi[(((6.8)^2 / (2Pi) * ln(16^-2)))] / (6.8)^2

Input:

$$2\pi \times \frac{\frac{6.8^2}{2\pi}\log\left(\frac{1}{16^2}\right)}{6.8^2}$$

$\log(x)$ is the natural logarithm

Result:

–5.5451774444795624753378569716654125446040010748820420329 6...

-5.545177444479…..

Alternative representations:

$$\frac{(2\pi)\left(6.8^2\log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} = \frac{2\pi\log_e\left(\frac{1}{16^2}\right)6.8^2}{(2\pi)\,6.8^2}$$

$$\frac{(2\pi)\left(6.8^2\log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} = \frac{2\pi\log(a)\log_a\left(\frac{1}{16^2}\right)6.8^2}{(2\pi)\,6.8^2}$$

$$\frac{(2\pi)\left(6.8^2\log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} = -\frac{2\pi\,\mathrm{Li}_1\left(1-\frac{1}{16^2}\right)6.8^2}{(2\pi)\,6.8^2}$$

Series representations:

$$\frac{(2\pi)\left(6.8^2\log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} = -\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{255}{256}\right)^k}{k}$$

$$\frac{(2\pi)\left(6.8^2\log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} = 2i\pi\left\lfloor\frac{\arg\left(\frac{1}{256}-x\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{256}-x\right)^k x^{-k}}{k} \quad \text{for } x<0$$

$$\frac{(2\pi)\left(6.8^2\log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} =$$
$$\left\lfloor\frac{\arg\left(\frac{1}{256}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg\left(\frac{1}{256}-z_0\right)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{256}-z_0\right)^k z_0^{-k}}{k}$$

Integral representation:

$$\frac{(2\pi)\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)}{(2\pi)\,6.8^2} = \int_1^{\frac{1}{256}} \frac{1}{t}\,dt$$

We have from the following ratio:

[(((((6.8)^2 / (2Pi) * ln(16^-2))))) / ((((2Pi[(((6.8)^2 / (2Pi) * ln(16^-2)))] / (6.8)^2))))]

Input:

$$\frac{\frac{6.8^2}{2\pi}\log\left(\frac{1}{16^2}\right)}{2\pi \times \frac{\frac{6.8^2}{2\pi}\log\left(\frac{1}{16^2}\right)}{6.8^2}}$$

$\log(x)$ is the natural logarithm

Result:

7.35932…

7.35932…

Alternative representations:

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{\log_e\left(\frac{1}{16^2}\right)6.8^2}{\frac{(2\pi)\left(2\pi \log_e\left(\frac{1}{16^2}\right)6.8^2\right)}{(2\pi)\,6.8^2}}$$

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{\log(a)\log_a\left(\frac{1}{16^2}\right)6.8^2}{\frac{(2\pi)\left(2\pi \log(a)\log_a\left(\frac{1}{16^2}\right)6.8^2\right)}{(2\pi)\,6.8^2}}$$

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = -\frac{\mathrm{Li}_1\left(1-\frac{1}{16^2}\right)6.8^2}{\frac{(2\pi)\left(-2\pi\,\mathrm{Li}_1\left(1-\frac{1}{16^2}\right)6.8^2\right)}{(2\pi)\,6.8^2}}$$

Series representations:

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{5.78}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{11.56}{-1+\sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{23.12}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{11.56}{\int_0^{\infty} \frac{1}{1+t^2}\,dt}$$

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{5.78}{\int_0^1 \sqrt{1-t^2}\,dt}$$

$$\frac{6.8^2 \log\left(\frac{1}{16^2}\right)}{\frac{\left(2\pi\left(6.8^2 \log\left(\frac{1}{16^2}\right)\right)\right)(2\pi)}{(2\pi)\,6.8^2}} = \frac{11.56}{\int_0^{\infty} \frac{\sin(t)}{t}\,dt}$$

From which:

Input:

$$\sqrt[4]{\frac{\frac{6.8^2}{2\pi}\log\left(\frac{1}{16^2}\right)}{2\pi \times \frac{\frac{6.8^2}{2\pi}\log\left(\frac{1}{16^2}\right)}{6.8^2}}}$$

$\log(x)$ is the natural logarithm

Result:

1.647060262021320885340860293125716426973712505100669929877...

$1.647060262\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Now, we have that:

c' = 1.18 c'' = 1.75

$g_s M^2 < (64\pi c' c'')/9,$

(64Pi*1.18*1.75)/9

Input:

$\frac{1}{9}(64\pi \times 1.18 \times 1.75)$

Result:

46.1325...

46.1325…

Alternative representations:

$\frac{64}{9}(\pi\, 1.18 \times 1.75) = \frac{23\,788.8^\circ}{9}$

$\frac{64}{9}(\pi\, 1.18 \times 1.75) = \frac{1}{9}(-132.16)\, i \log(-1)$

$\frac{64}{9}(\pi\, 1.18 \times 1.75) = \frac{1}{9} \times 132.16 \cos^{-1}(-1)$

Series representations:

$\frac{64}{9}(\pi\, 1.18 \times 1.75) = 58.7378 \sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}$

$$\frac{64}{9}(\pi\, 1.18 \times 1.75) = -29.3689 + 29.3689 \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}$$

$$\frac{64}{9}(\pi\, 1.18 \times 1.75) = 14.6844 \sum_{k=0}^{\infty} \frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\frac{64}{9}(\pi\, 1.18 \times 1.75) = 29.3689 \int_0^{\infty} \frac{1}{1+t^2}\, dt$$

$$\frac{64}{9}(\pi\, 1.18 \times 1.75) = 58.7378 \int_0^{1} \sqrt{1-t^2}\, dt$$

$$\frac{64}{9}(\pi\, 1.18 \times 1.75) = 29.3689 \int_0^{\infty} \frac{\sin(t)}{t}\, dt$$

We have:

$$g_s M^2 \geq (6.8)^2 q\ , \tag{1.1}$$

where g_s is the string coupling and q is the number of antibranes. In this paper we consider the most favorable case $q = 1$.

, $\rho + \bar{\rho} = (\mathrm{Vol}_6)^{3/2}$,,

$g_sM^2 = 46.24$ or 46.1325… (see previous result)

$$V_n(r) = \frac{\pi^{n/2}}{\Gamma(\frac{n}{2}+1)} r^n,$$

For n = 6 and r = 2 , we obtain: $\mathrm{Vol}_6 =$ (Pi^3 * 2^6) / (gamma (4))

(Pi^3 * 2^6) / (gamma (4))

Input:

$$\frac{\pi^3 \times 2^6}{\Gamma(4)}$$

$\Gamma(x)$ is the gamma function

Exact result:

$$\frac{32\,\pi^3}{3}$$

Decimal approximation:

330.733617923198081871747360715748215490403078036107815404 2...

330.7336179…

Property:

$\frac{32\,\pi^3}{3}$ is a transcendental number

Alternative representations:

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{2^6\,\pi^3}{6}$$

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{2^6\,\pi^3}{3!}$$

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{2^6\,\pi^3}{\Gamma(4,\,0)}$$

Series representations:

$$\frac{\pi^3\,2^6}{\Gamma(4)} = -\frac{1024}{3}\sum_{k=1}^{\infty}\frac{(-1)^k}{(-1+2\,k)^3}$$

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{2048}{3}\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2\,k}\right)^3$$

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{32}{3}\left(\sum_{k=0}^{\infty} -\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^3$$

Integral representations:

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{2048}{3}\left(\int_0^1 \sqrt{1-t^2}\,dt\right)^3$$

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{256}{3}\left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^3$$

$$\frac{\pi^3\,2^6}{\Gamma(4)} = \frac{256}{3}\left(\int_0^1 \frac{1}{\sqrt{1-t^2}}\,dt\right)^3$$

((((Pi^3 * 2^6) / (gamma (4)))))^(3/2)

Input:

$$\left(\frac{\pi^3\times 2^6}{\Gamma(4)}\right)^{3/2}$$

$\Gamma(x)$ is the gamma function

Exact result:

$$\frac{128}{3}\sqrt{\frac{2}{3}}\,\pi^{9/2}$$

Decimal approximation:

6014.749054087224787249141260155714103914765744493644445414...

6014.749054…

Property:

$\frac{128}{3}\sqrt{\frac{2}{3}}\,\pi^{9/2}$ is a transcendental number

All values of ((32 π^3)/3)^(3/2):

$$\frac{128}{3}\sqrt{\frac{2}{3}}\ \pi^{9/2}\ e^{0} \approx 6015.$$ (real root)

$$\frac{128}{3}\sqrt{\frac{2}{3}}\ \pi^{9/2}\ e^{i\pi} \approx -6015.$$ (real root)

Alternative representations:

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = \left(\frac{2^6\ \pi^3}{6}\right)^{3/2}$$

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = \left(\frac{2^6\ \pi^3}{3!}\right)^{3/2}$$

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = \left(\frac{2^6\ \pi^3}{\Gamma(4,\ 0)}\right)^{3/2}$$

Series representations:

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = 512\left(\frac{\pi^3}{\sum_{k=0}^{\infty}\frac{(4-z_0)^k\ \Gamma^{(k)}(z_0)}{k!}}\right)^{3/2} \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = 512\,\pi^2\left(\sum_{k=0}^{\infty}(4-z_0)^k\sum_{j=0}^{k}\frac{(-1)^j\ \pi^{-j+k}\ \sin\left(\frac{1}{2}\pi\,(-j+k+2\,z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)$$
$$\sqrt{\pi^2\sum_{k=0}^{\infty}(4-z_0)^k\sum_{j=0}^{k}\frac{(-1)^j\ \pi^{-j+k}\ \sin\left(\frac{1}{2}\pi\,(-j+k+2\,z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}}$$

Integral representations:

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = 512\left(\frac{\pi^3}{\int_0^1 \log^3\left(\frac{1}{t}\right)dt}\right)^{3/2}$$

$$\left(\frac{\pi^3\ 2^6}{\Gamma(4)}\right)^{3/2} = 512\left(\frac{\pi^3}{\int_0^{\infty} e^{-t}\ t^3\ dt}\right)^{3/2}$$

$$\left(\frac{\pi^3\, 2^6}{\Gamma(4)}\right)^{3/2} = 512\left(e^{-\int_0^1 (-3+x+x^2+x^3)/\log(x)\,dx}\,\pi^3\right)^{3/2}$$

Thence:

$$\left[\ \rho+\bar{\rho} = (\mathrm{Vol}_6)^{3/2},\right] = 6014.749\ldots.$$

Now:

$$I(\mathcal{T}) = \int_{\mathcal{T}}^{\infty} \mathrm{d}x \frac{x\coth x - 1}{\sinh^2 x}\left(\sinh(2x) - 2x\right)^{1/3}.$$

(((coth(x-1)*(sinh(2x)-2x)^(1/3) / (sinh^2(x))))

Input:

$$\coth(x-1) \times \frac{\sqrt[3]{\sinh(2x) - 2x}}{\sinh^2(x)}$$

$\coth(x)$ is the hyperbolic cotangent function

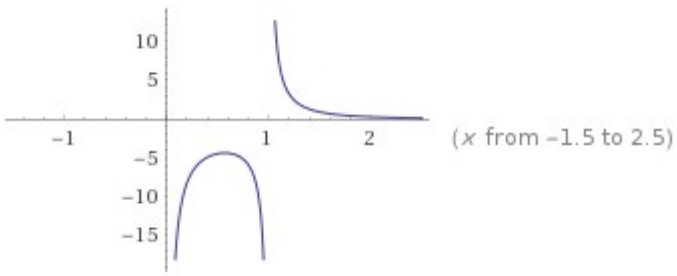
$\sinh(x)$ is the hyperbolic sine function

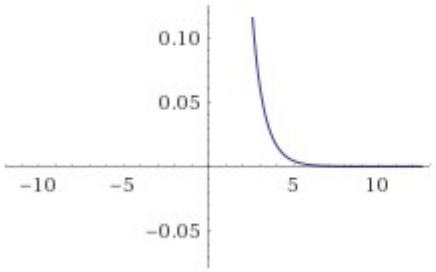
Result:

$$\sqrt[3]{\sinh(2x) - 2x}\ (-\coth(1-x))\,\mathrm{csch}^2(x)$$

$\mathrm{csch}(x)$ is the hyperbolic cosecant function

Plots:





(x from −11.5 to 12.5)

Alternate forms:

$$-\frac{\cosh(1-x)\sqrt[3]{-2x+\sinh(2x)}}{\sinh(1-x)\sinh^2(x)}$$

$$-\frac{\sqrt[3]{2\sinh(2x)-4x}\,\coth\left(\frac{1}{2}(2-2x)\right)\operatorname{csch}^2(x)}{\sqrt[3]{2}}$$

$$-\frac{\sqrt[3]{\sinh(2x)-2x}\,\operatorname{csch}^2(x)\left(-e^2\sinh(x)+\sinh(x)+e^2\cosh(x)+\cosh(x)\right)}{-e^2\sinh(x)-\sinh(x)+e^2\cosh(x)-\cosh(x)}$$

$\cosh(x)$ is the hyperbolic cosine function

Series expansion at x = 0:

$$-\frac{\sqrt[3]{x^3}\,\sinh(2)\operatorname{csch}^2(1)}{\sqrt[3]{6}\,x^2}-\frac{2^{2/3}\sqrt[3]{x^3}\,(\coth^2(1)-1)}{\sqrt[3]{3}\,x}+\frac{2^{2/3}\sqrt[3]{x^3}\,\coth(1)\left(19-15\coth^2(1)\right)}{15\sqrt[3]{3}}-\frac{x\left(2^{2/3}\sqrt[3]{x^3}\,\left(3+5\coth^4(1)-8\coth^2(1)\right)\right)}{5\sqrt[3]{3}}-\frac{x^2\left(2^{2/3}\sqrt[3]{x^3}\,\coth(1)\left(1543+1575\coth^4(1)-3045\coth^2(1)\right)\right)}{1575\sqrt[3]{3}}+O(x^3)$$

(generalized Puiseux series)

Derivative:

$$\frac{d}{dx}\left(\frac{\coth(x-1)\sqrt[3]{\sinh(2x)-2x}}{\sinh^2(x)}\right)=\frac{1}{3(\sinh(2x)-2x)^{2/3}}\operatorname{csch}^2(x)\left(3(2x-\sinh(2x))\operatorname{csch}^2(x-1)+2\coth(x-1)(\cosh(2x)+6x\coth(x)-3\sinh(2x)\coth(x)-1)\right)$$

for x = 2, we obtain:

integrate (((sinh(2 *2) - 2 *2)^(1/3) (-coth(1 - 2)) csch^2(2)))x

Indefinite integral:

$$\int \left(\sqrt[3]{\sinh(2\times 2)-2\times 2}\ (-\coth(1-2))\,\mathrm{csch}^2(2)\right) x\,dx \approx \text{constant} + 0.14253\,x^2$$

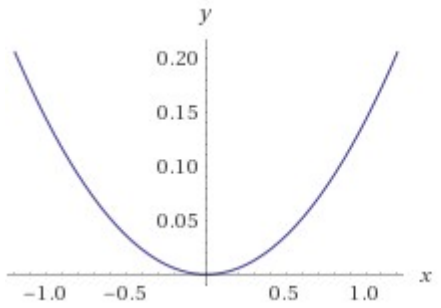
0.14253

$\sinh(x)$ is the hyperbolic sine function

$\coth(x)$ is the hyperbolic cotangent function

$\mathrm{csch}(x)$ is the hyperbolic cosecant function

Plot of the integral:



(x from −1.2 to 1.2)

Alternate forms of the integral:

$$\frac{x^2\cosh(1)\sqrt[3]{-4+\sinh(4)}}{2\sinh(1)\sinh^2(2)} + \text{constant}$$

$$\frac{e\sqrt[3]{-4-\frac{1}{2e^4}+\frac{e^4}{2}}\ x^2}{4\left(\frac{e}{2}-\frac{1}{2e}\right)\left(\frac{e^2}{2}-\frac{1}{2e^2}\right)^2} + \frac{\sqrt[3]{-4-\frac{1}{2e^4}+\frac{e^4}{2}}\ x^2}{4\left(\frac{e}{2}-\frac{1}{2e}\right)e\left(\frac{e^2}{2}-\frac{1}{2e^2}\right)^2} + \text{constant}$$

$$\frac{2\left(\frac{1}{e}+e\right)\sqrt[3]{\frac{1}{2}\left(e^4-\frac{1}{e^4}\right)-4}\ x^2}{\left(e-\frac{1}{e}\right)\left(e^2-\frac{1}{e^2}\right)^2} + \text{constant}$$

$\cosh(x)$ is the hyperbolic cosine function

Alternate form assuming x is real:

$$-\frac{2x^2\sinh^3(2)\sqrt[3]{\sinh(4)-4}}{(1-\cosh(2))\,(1-\cosh(4))^2} + \text{constant}$$

Now:

An anti-D3 brane at the tip of the throat uplifts the KS potential (2.19). The contribution to the potential is determined from

$$S_{D3} = S_{DBI} + S_{CS} = -T_3 \int \mathrm{d}^4x\sqrt{-g_4}[1 + \mathcal{O}(\alpha'^2)] \pm T_3 \int C_4\,, \tag{2.20}$$

where the sign in front of the second term is determined by the charge of the brane, and T_3 is given by $T_3 = \frac{1}{(2\pi)^3\alpha'^2}$. For the D3-brane in a background given by (2.1), the DBI and the CS pieces of the action cancel each other. Hence, for the $\overline{\text{D3}}$-brane they add up and one finds

$$V_{\overline{D3}} = -2T_3C_4 = \frac{2}{(2\pi)^3\alpha'^2}H^{-1}\,. \tag{2.21}$$

Using the warp factor given in (2.8) and turning into the 4d Einstein frame, one finally obtains

$$V_{\overline{D3}} = \frac{1}{\pi(\rho+\bar{\rho})^2}\frac{2^{1/3}}{I(\mathcal{T})}\frac{|Z|^{4/3}}{g_sM^2}\,. \tag{2.22}$$

The $I(\mathcal{T})$, defined in (2.9) is a monotonically decreasing function. Therefore, a $\overline{\text{D3}}$-brane has minimal energy if it is placed at the tip of the throat. For later convenience we introduce a constant $c'' = \frac{2^{1/3}}{I(0)} \approx 1.75$.

We have that:

$$V_{\overline{D3}} = \frac{1}{\pi(\rho+\bar{\rho})^2}\frac{2^{1/3}}{I(\mathcal{T})}\frac{|Z|^{4/3}}{g_sM^2}\,.$$

For: $g_sM^2 = 46.24$; $Z = 3$

1/(Pi*(6014.749)^2) * (2^(1/3)) / (0.14253) * (3^(4/3)) / (46.24)

Input interpretation:

$$\frac{1}{\pi \times 6014.749^2} \times \frac{\sqrt[3]{2}}{0.14253} \times \frac{3^{4/3}}{46.24}$$

Result:

$7.27773\ldots \times 10^{-9}$

7.27773…*10^-9

Alternative representations:

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{\sqrt[3]{2}\ 3^{4/3}}{0.14253\times 46.24\left(180^\circ\, 6014.75^2\right)}$$

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{\sqrt[3]{2}\ 3^{4/3}}{0.14253\times 46.24\left(-i\left(\log(-1)\, 6014.75^2\right)\right)}$$

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{\sqrt[3]{2}\ 3^{4/3}}{0.14253\times 46.24\left(\cos^{-1}(-1)\, 6014.75^2\right)}$$

Series representations:

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{5.71592\times 10^{-9}}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{1.14318\times 10^{-8}}{-1+\sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{2.28637\times 10^{-8}}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{1.14318\times 10^{-8}}{\int_0^{\infty} \frac{1}{1+t^2}\, dt}$$

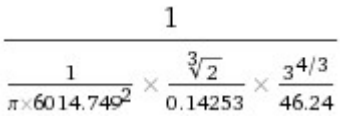
$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{5.71592\times 10^{-9}}{\int_0^1 \sqrt{1-t^2}\, dt}$$

$$\frac{\sqrt[3]{2}\ 3^{4/3}}{(0.14253\times 46.24)\left(\pi\, 6014.75^2\right)} = \frac{1.14318\times 10^{-8}}{\int_0^{\infty} \frac{\sin(t)}{t}\, dt}$$

From which:

1/[1/(Pi*(6014.749)^2) * (2^(1/3)) / (0.14253) * (3^(4/3)) / (46.24)]

Input interpretation:

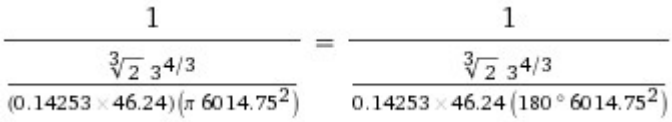


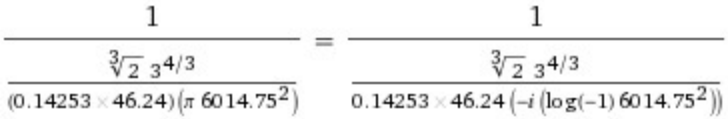
Result:

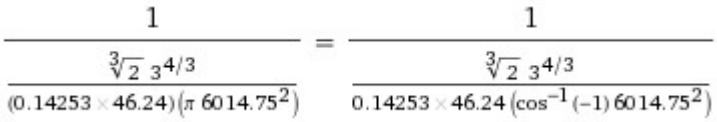
$1.37405... \times 10^8$

$1.37405…*10^8$

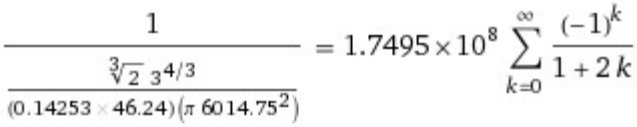
Alternative representations:

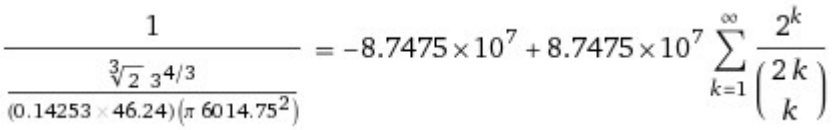


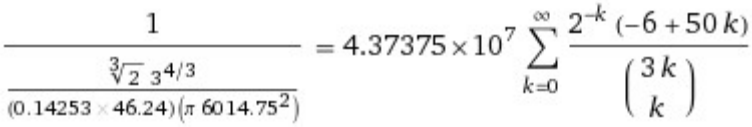




Series representations:







Integral representations:

$$\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}} = 8.7475\times 10^7 \int_0^\infty \frac{1}{1+t^2}\,dt$$

$$\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}} = 1.7495\times 10^8 \int_0^1 \sqrt{1-t^2}\,dt$$

$$\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}} = 8.7475\times 10^7 \int_0^\infty \frac{\sin(t)}{t}\,dt$$

From which:

((((1/[1/(Pi*(6014.749)^2) * (2^(1/3)) / (0.14253) * (3^(4/3)) / (46.24)])))^1/39

Input interpretation:

$$\sqrt[39]{\frac{1}{\frac{1}{\pi\times 6014.749^2}\times\frac{\sqrt[3]{2}}{0.14253}\times\frac{3^{4/3}}{46.24}}}$$

Result:

1.6168389732219508851606382589854661189657049932166306088 22...

1.61683897322…. result that is a good approximation to the value of the golden ratio 1.618033988749...

and:

1/7((((1/[1/(Pi*(6014.749)^2) * (2^(1/3)) / (0.14253) * (3^(4/3)) / (46.24)])))^1/2 + 55

Input interpretation:

$$\frac{1}{7}\sqrt{\frac{1}{\frac{1}{\pi\times 6014.749^2}\times\frac{\sqrt[3]{2}}{0.14253}\times\frac{3^{4/3}}{46.24}}} + 55$$

Result:

1729.57251118446898299278628064698234433754766398605641004 3...

1729.5725111…

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/[1/(Pi*(6014.749)^2) * (2^(1/3)) / (0.14253) * (3^(4/3)) / (46.24)])))^1/4 + 34 – Pi

Input interpretation:

$$\sqrt[4]{\frac{1}{\frac{1}{\pi\times 6014.749^2}\times\frac{\sqrt[3]{2}}{0.14253}\times\frac{3^{4/3}}{46.24}}}+34-\pi$$

Result:

139.127...

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

Alternative representations:

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\,6014.75^2)}}}+34-\pi=34-180^\circ+\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{0.14253\times 46.24\,(180^\circ\,6014.75^2)}}}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\,6014.75^2)}}}+34-\pi=$$

$$34-\cos^{-1}(-1)+\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{0.14253\times 46.24\,(\cos^{-1}(-1)\,6014.75^2)}}}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\,6014.75^2)}}}+34-\pi=$$

$$34+i\log(-1)+\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{0.14253\times 46.24\left(-i\left(\log(-1)\,6014.75^2\right)\right)}}}$$

Series representations:

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\,6014.75^2)}}}+34-\pi=$$

$$96.7099\left(0.372247+\sqrt[4]{-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}}-0.0206804\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\,6014.75^2)}}}+34-\pi=$$

$$81.323\left(0.418086-0.0122966\,x-0.0245933\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}+\sqrt[4]{x+2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}}\right)$$

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

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\,6014.75^2)}}}+34-\pi=$$

$$96.7099\left(0.351567-0.0206804\sqrt{3}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{3}\right)^k}{1+2k}+\sqrt[4]{\sqrt{3}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{3}\right)^k}{1+2k}}\right)$$

Integral representations:

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}} + 34 - \pi =$$
$$-2.\left(-3.75354 + \sqrt[4]{\int_0^\infty \frac{1}{1+t^2}\,dt}\right)\left(0.351252 + \sqrt[4]{\int_0^\infty \frac{1}{1+t^2}\,dt}\right)$$
$$\left(12.894 + 3.40229\sqrt[4]{\int_0^\infty \frac{1}{1+t^2}\,dt} + \sqrt{\int_0^\infty \frac{1}{1+t^2}\,dt}\right)$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}} + 34 - \pi =$$
$$-2.\left(-3.75354 + \sqrt[4]{\int_0^\infty \frac{\sin(t)}{t}\,dt}\right)\left(0.351252 + \sqrt[4]{\int_0^\infty \frac{\sin(t)}{t}\,dt}\right)$$
$$\left(12.894 + 3.40229\sqrt[4]{\int_0^\infty \frac{\sin(t)}{t}\,dt} + \sqrt{\int_0^\infty \frac{\sin(t)}{t}\,dt}\right)$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}} + 34 - \pi =$$
$$-4.\left(-3.15634 + \sqrt[4]{\int_0^1 \sqrt{1-t^2}\,dt}\right)\left(0.295367 + \sqrt[4]{\int_0^1 \sqrt{1-t^2}\,dt}\right)$$
$$\left(9.11745 + 2.86097\sqrt[4]{\int_0^1 \sqrt{1-t^2}\,dt} + \sqrt{\int_0^1 \sqrt{1-t^2}\,dt}\right)$$

((((1/[1/(Pi*(6014.749)^2) * (2^(1/3)) / (0.14253) * (3^(4/3)) / (46.24)])))^1/4+18-1

Input interpretation:

$$\sqrt[4]{\frac{1}{\frac{1}{\pi\times 6014.749^2}\times\frac{\sqrt[3]{2}}{0.14253}\times\frac{3^{4/3}}{46.24}}} + 18 - 1$$

Result:

125.268…

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

Alternative representations:

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}}+18-1=17+\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{0.14253\times 46.24\,(180^\circ\, 6014.75^2)}}}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}}+18-1=17+\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{0.14253\times 46.24\,(-i\,(\log(-1)\, 6014.75^2))}}}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}}+18-1=17+\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{0.14253\times 46.24\,(\cos^{-1}(-1)\, 6014.75^2)}}}$$

Series representations:

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}}+18-1=17+115.008\sqrt[4]{\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}}+18-1=17+96.7099\sqrt[4]{-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}}+18-1=17+81.323\sqrt[4]{\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}} + 18 - 1 = 17 + 96.7099\sqrt[4]{\int_0^{\infty}\frac{1}{1+t^2}\,dt}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}} + 18 - 1 = 17 + 115.008\sqrt[4]{\int_0^{1}\sqrt{1-t^2}\,dt}$$

$$\sqrt[4]{\frac{1}{\frac{\sqrt[3]{2}\,3^{4/3}}{(0.14253\times 46.24)(\pi\, 6014.75^2)}}} + 18 - 1 = 17 + 96.7099\sqrt[4]{\int_0^{\infty}\frac{\sin(t)}{t}\,dt}$$

From:

https://mss-cat.trin.cam.ac.uk/manuscripts/uv/view.php?n=Add.Ms.a.94.13#?c=0&m=0&s=0&cv=27&xywh=-142%2C-39%2C5437%2C3154

We have that (see papers https://fermatslibrary.com/p/a308d666 , https://fermatslibrary.com/p/e68c93f8):

A)

1/(7*186.048)(-4.40261245309250151172101353400005116666512384 × 10^37-17*279.1936)

$$\frac{1}{7\times 186.048}\left(-4.40261245309250151172101353400005116666512384\times 10^{37} + 17\times(-279.1936)\right)$$

$$-3.38055037493588560227238864164090652588444444444444\ldots\times 10^{34}$$

$-3.3805503749….*10^{34} = \tau_2(n)\, x^n$

B)

5* 2*9.83114*i*((1-2)(1-2^2)(1-2^3))^24 +19*279.1936

$5 \times 2 \times 9.83114\, i\left((1-2)\left(1-2^2\right)\left(1-2^3\right)\right)^{24} + 19 \times 279.1936$

i is the imaginary unit

5304.68... +
$5.31945... \times 10^{33}\, i$

$r = 5.31945 \times 10^{33}$ (radius), $\theta = 90°$ (angle)

$5.31945*10^{33} = \tau_3(n)\, x^n$

C)

(-312.388*9.831141i)*2(((((1-2)(1-2^2)(1-2^3)))))^24

$(-312.388 \times 9.831141\, i) \times 2\left((1-2)\left(1-2^2\right)\left(1-2^3\right)\right)^{24}$

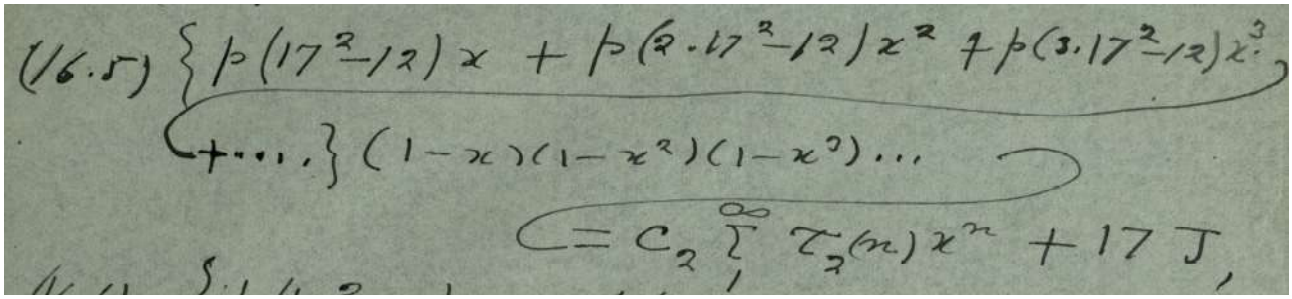
i is the imaginary unit

-0
$3.32347... \times 10^{35}\, i$

$r = 3.32347 \times 10^{35}$ (radius), $\theta = -90°$ (angle)

$3.32347*10^{35} = \tau_5(n)\, x^n$

From:



For J = 279.1936 and x = 2

((p(277)*2 + p(566)*2^2 + p(855)*2^3)) (1-2)(1-2^2)(1-2^3)

p(277) = 1762278433057269
p(566) = 79716708303343130521599
p(855) = 623519958213314499884660917 12

(1762278433057269*2+79716708303343130521599*2^2+623519958213314499884660917 12*2^3) (1-2)(1-2^2)(1-2^3)

Input:

$$(1\,762\,278\,433\,057\,269 \times 2 + 79\,716\,708\,303\,343\,130\,521\,599 \times 2^2 + 62\,351\,995\,821\,331\,449\,988\,466\,091\,712 \times 2^3)(1-2)(1-2^2)(1-2^3)$$

Result:

$$-10\,475\,141\,994\,187\,255\,094\,579\,455\,627\,230$$

$-1.047514199418725509457945562723\times 10^{31}$

(-3.3805503749e+34) + 17*279.1936

Input interpretation:

$$-3.3805503749 \times 10^{34} + 17 \times 279.1936$$

Result:

$$-3.380550374899999999999999999999952537088 \times 10^{34}$$

$-3.380550374899999999999999999999952537088 \times 10^{34}$

We have that:

(-1.047514199418725509457945562723×10^31)x = -3.380550374899999999999999999999952537088 × 10^34

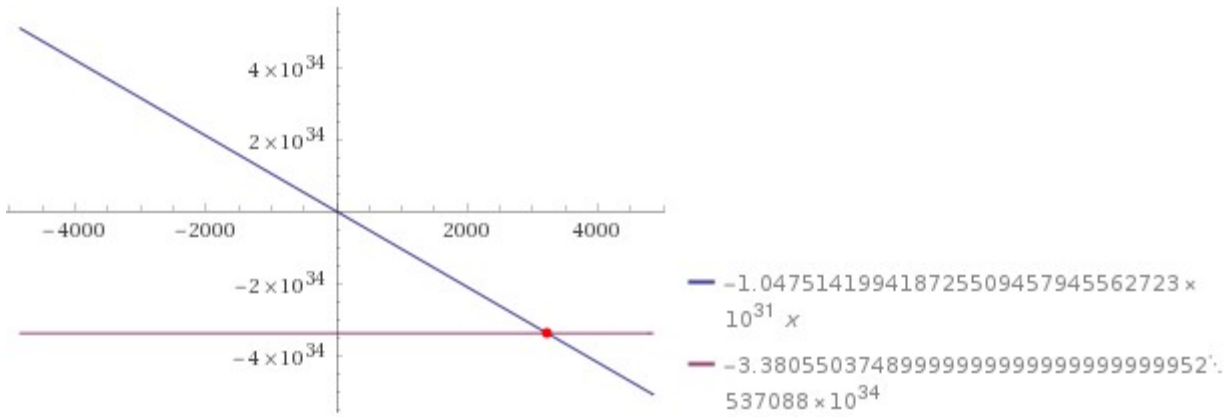
Input interpretation:

$$-1.047514199418725509457945562723 \times 10^{31}\, x = -3.380550374899999999999999999999952537088 \times 10^{34}$$

Result:

$$-1.047514199418725509457945562723 \times 10^{31}\, x = -3.380550374899999999999999999999952537088 \times 10^{34}$$

Plot:



Alternate form:

$$3.380550374899999999999999999999952537088 \times 10^{34} - 1.047514199418725509457945562723 \times 10^{31}\, x = 0$$

Solution:

$$x \approx 3227.211981256097530969844825 18$$

3227.2119812…

Indeed:

(1762278433057269*2+797167083033431305215 99*2^2+623519958213314499884660917 12*2^3) (1-2)(1-2^2)(1-2^3) * 3227.211981256097530969844825 18

Input interpretation:

$$(1\,762\,278\,433\,057\,269 \times 2 + 79\,716\,708\,303\,343\,130\,521\,599 \times 2^2 + 62\,351\,995\,821\,331\,449\,988\,466\,091\,712 \times 2^3)\,(1-2)\,(1-2^2)\,((1-2^3) \times 3227.211981256097530969844825 18)$$

Result:

$-3.380550374899999999999999999994445581089468025031044... \times 10^{34}$

$-3.380550374899999999999999999994445581089468025031044 \times 10^{34}$

From which:

-(728+89+2)^3(-3.3805503748999 × 10^34)

Where 728 is a Ramanujan taxicab number $9^3 - 1^3 = 729 - 1 = 728$, while 89 and 2 are Fibonacci numbers

Input interpretation:

$-(728 + 89 + 2)^3 \left(-3.3805503748999 \times 10^{34}\right)$

Result:

18 571 163 656 649 318 637 741 000 000 000 000 000 000 000

Scientific notation:

$1.857116365664931863774 1 \times 10^{43}$

$1.8571163\ldots*10^{43}$ result very near to the value of the Planck frequency $1.8549*10^{43}$

We note that:

p(1192) = 3459834525147230510643216185688300 7

and we have the following ratio:

(3459834525147230510643216185688300 7 / -3.380550374899999999999999999994445581089468025031044 × 10^34)

Input interpretation:

$$-\frac{34\,598\,345\,251\,472\,305\,106\,432\,161\,856\,883\,007}{3.380550374899999999999999999994445581089468025031044 \times 10^{34}}$$

Result:

$-1.023453030262735195498895562307328416336959756639005721 29...$

-1.023453030262735195498895562307328416336959756639005721 29

(-1/(-1.023453030262735195498895562307328416336959756639005721 29))^1/32

Input interpretation:

$$\sqrt[32]{\frac{-1}{-1.023453030262735195498895562307328416336959756639005721 29}}$$

Result:

0.999275817541336554987476973764626462356363012581281873303...

0.99927581754…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the Omega mesons ($\omega/\omega_3 \mid 5+3 \mid m_{u/d}=255-390 \mid 0.988-1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243 = \phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

(-(-1.023453030262735195498895562307328416336959756639005721 29))^21

Input interpretation:

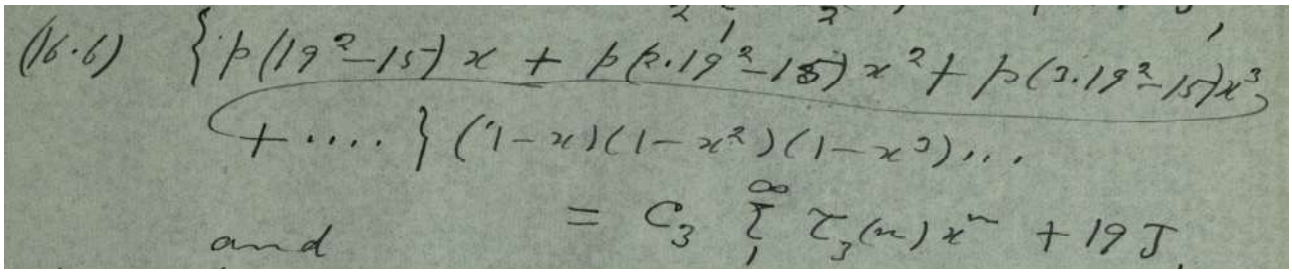
$$(-(-1.023453030262735195498895562307328416336959756639005721 29))^{21}$$

Result:

1.627144941279523183210223614174216533630827583051110967693...

1.6271449412795…..

Now, we have:



p(346)*2 + p(707)*2^2 + p(1068)*2^3

(((2146182997432862 99*2 + 83868452507581852374822598 * 2^2 + 339629036885985812650521091739503 * 2^3 (1-2)(1-2^2)(1-2^3)))) = ((((5.31945e+33) + 19*279.1936)))x

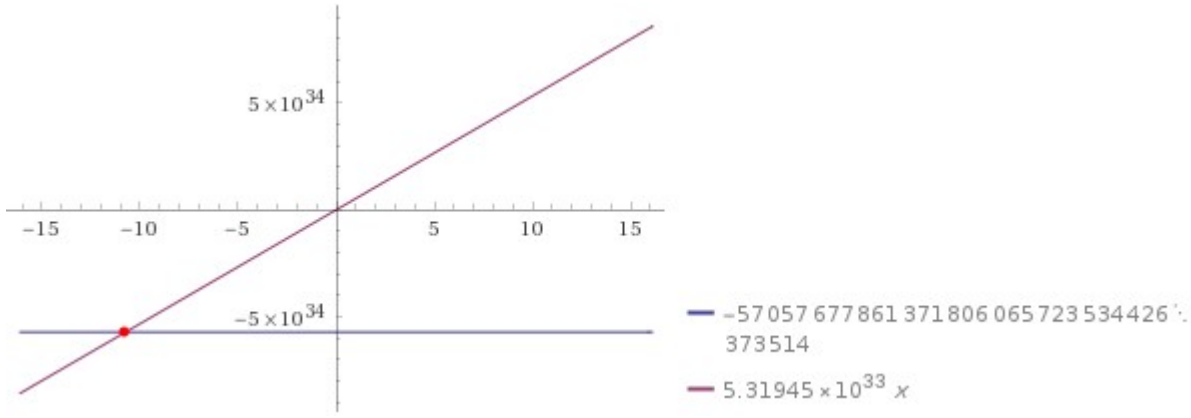
Input interpretation:

$$214\,618\,299\,743\,286\,299\times 2 + 83\,868\,452\,507\,581\,852\,374\,822\,598\times 2^2 + 339\,629\,036\,885\,985\,812\,650\,521\,091\,739\,503\times 2^3\,((1-2)(1-2^2)(1-2^3)) = (5.31945\times 10^{33} + 19\times 279.1936)\,x$$

Result:

$$-57\,057\,677\,861\,371\,806\,065\,723\,534\,426\,373\,514 = 5.31945\times 10^{33}\,x$$

Plot:



Alternate form:

$-5.31945\times10^{33}\,x-57057677861371806065723534426373514=0$

Alternate form assuming x is real:

$-57057677861371806065723534426373514=5.31945\times10^{33}\,x+0$

Solution:

$x\approx-10.7262$

Result:

$-5.7057677861371806065723534426373514\times10^{34}$

-5.705767786…*10^{34}

((((5.31945e+33) + 19*279.1936)))(-10.7262)

Input interpretation:

$(5.31945\times10^{33}+19\times279.1936)\times(-10.7262)$

Result:

$-5.705748459000000000000000000000056899041454 08\times10^{34}$

-5.70574859…*10^{34}

p(1206) = 57441042572873737644094937785113022

From the ratio between the two results, we obtain:

(57441042572873737644094937785113022/57057484590000000000000000000056899)

Input:

$$\frac{57\,441\,042\,572\,873\,737\,644\,094\,937\,785\,113\,022}{57\,057\,484\,590\,000\,000\,000\,000\,000\,000\,056\,899}$$

Exact result:

$$\frac{57\,441\,042\,572\,873\,737\,644\,094\,937\,785\,113\,022}{57\,057\,484\,590\,000\,000\,000\,000\,000\,000\,056\,899}$$ (irreducible)

Decimal approximation:

1.006722307960645021559562196344199906612100217348860917785...

1.0067223079…

(57441042572873737644094937785113022/57057484590000000000000000000056899)^72

Input:

$$\left(\frac{57\,441\,042\,572\,873\,737\,644\,094\,937\,785\,113\,022}{57\,057\,484\,590\,000\,000\,000\,000\,000\,000\,056\,899}\right)^{72}$$

Decimal approximation:

1.619935944423956805482336004548347048851664852127785446007...

1.6199359444…. result that is a good approximation to the value of the golden ratio 1.618033988749...

(1/(57441042572873737644094937785113022/5705748459000000000000000000056899))^1/8

Input:

$$\sqrt[8]{\frac{1}{\frac{57\,441\,042\,572\,873\,737\,644\,094\,937\,785\,113\,022}{57\,057\,484\,590\,000\,000\,000\,000\,000\,000\,056\,899}}}$$

Exact result:

$$\sqrt[8]{\frac{57\,057\,484\,590\,000\,000\,000\,000\,000\,000\,056\,899}{57\,441\,042\,572\,873\,737\,644\,094\,937\,785\,113\,022}}$$

Decimal approximation:

0.999162873835806026947780963304463123108097190580235938497...

0.9991628738…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the Omega mesons ($\omega/\omega_3 \mid 5+3 \mid m_{u/d}=255-390 \mid 0.988-1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243 = \phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Further, we have:

(728-41)^3 (-((((5.31945e+33) + 19*279.1936)))(-10.7262))

Where 728 is a Ramanujan taxicab number ($9^3 - 1 = 729 - 1 = 728$) and 41 is a Eisenstein prime number

Input interpretation:

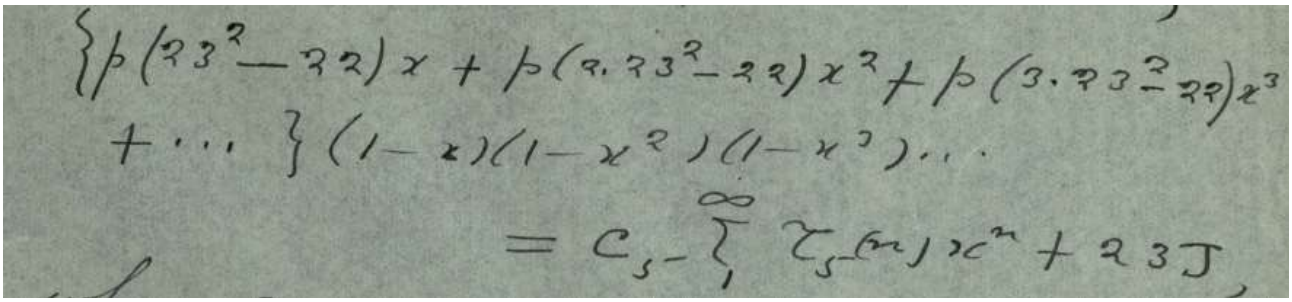
$(728-41)^3\,(-(5.31945\times 10^{33}+19\times 279.1936)\times(-10.7262))$

Result:

$1.850047302984244677000000000001844909899917994957824\ldots\times 10^{43}$

$1.85004730298\ldots*10^{43}$ result very near to the value of Planck frequency 1.8549×10^{43} Hz

Now, we have that:



$3.32347*10^{35} = \tau_5(n)\, x^n$

p(507)*2 + p(1036)*2^2+p(1565)*2^3 (1-2)(1-2^2)(1-2^3)

p(507) = 3384893356244349844341

p(1036) = 98757017491716010698603869808070

p(1565) = 10721617022118294111300879958656795681727

(3384893356244349844341*2+98757017491716010698603869808070*2^2+10721617022118294111300879958656795681727*2^3) * (1-2)(1-2^2)(1-2^3) = ((((3.32347e+35) + 23*279.1936)))x

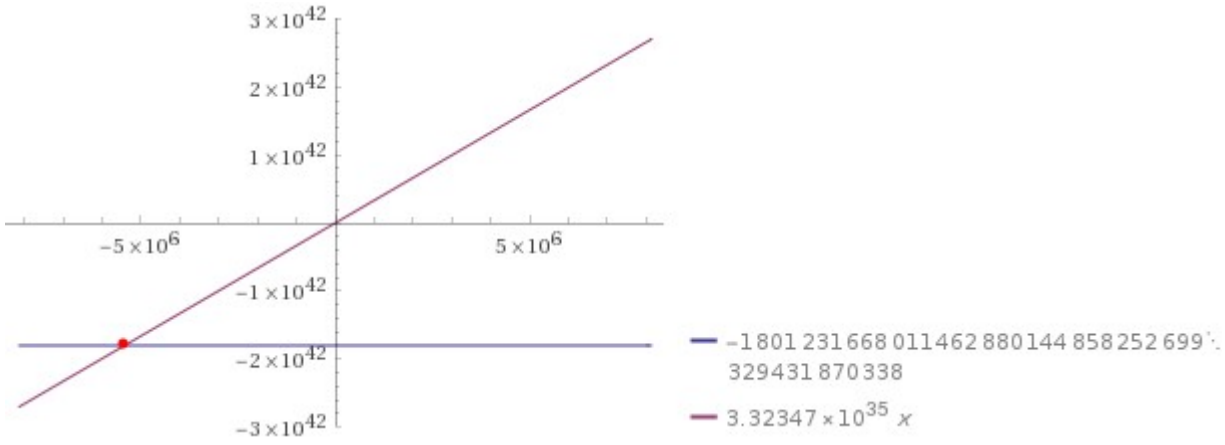
Input interpretation:

$(3\,384\,893\,356\,244\,349\,844\,341\times 2+98\,757\,017\,491\,716\,010\,698\,603\,869\,808\,070\times 2^2+10\,721\,617\,022\,118\,294\,111\,300\,879\,958\,656\,795\,681\,727\times 2^3)$
$(1-2)(1-2^2)(1-2^3)=(3.32347\times 10^{35}+23\times 279.1936)\,x$

Result:

$$-1\,801\,231\,668\,011\,462\,880\,144\,858\,252\,699\,329\,431\,870\,338 = 3.32347\times10^{35}\,x$$

Plot:



Alternate form:

$$-3.32347\times10^{35}\,x - 1\,801\,231\,668\,011\,462\,880\,144\,858\,252\,699\,329\,431\,870\,338 = 0$$

Alternate form assuming x is real:

$$-1\,801\,231\,668\,011\,462\,880\,144\,858\,252\,699\,329\,431\,870\,338 = 3.32347\times10^{35}\,x + 0$$

Solution:

$$x \approx -5.41973\times10^{6}$$

-5.41973*10^6

(33848933562443498443412+98757017491716010698603869808070*2^2+10721617022118294111300879958656795681727*2^3) * (1-2)(1-2^2)(1-2^3)

Input:

$$(3\,384\,893\,356\,244\,349\,844\,341\times2 + 98\,757\,017\,491\,716\,010\,698\,603\,869\,808\,070\times2^2 + 10\,721\,617\,022\,118\,294\,111\,300\,879\,958\,656\,795\,681\,727\times2^3)$$
$$(1-2)(1-2^2)(1-2^3)$$

Result:

$$-1\,801\,231\,668\,011\,462\,880\,144\,858\,252\,699\,329\,431\,870\,338$$

-1801231668011462880144858252699329431870338

Result:

$$-1.801231668011462880144858252699329431870338\times10^{42}$$

p(1731) = 184117994151827850151728416761687619847730 9

from the ratio between the two values, we obtain:

(184117994151827850151728416761687619847730 9 /
180123166801146288014485825269932943187033 8)

Input:

$$\frac{1\,841\,179\,941\,518\,278\,501\,517\,284\,167\,616\,876\,198\,477\,309}{1\,801\,231\,668\,011\,462\,880\,144\,858\,252\,699\,329\,431\,870\,338}$$

Exact result:

$$\frac{263\,025\,705\,931\,182\,643\,073\,897\,738\,230\,982\,314\,068\,187}{257\,318\,809\,715\,923\,268\,592\,122\,607\,528\,475\,633\,124\,334}$$

Decimal approximation:

1.022178309551329404046555693217502968039944810826991700639...

1.02217830955…

(184117994151827850151728416761687619847730 9 /
180123166801146288014485825269932943187033 8)^23

Input:

$$\left(\frac{1\,841\,179\,941\,518\,278\,501\,517\,284\,167\,616\,876\,198\,477\,309}{1\,801\,231\,668\,011\,462\,880\,144\,858\,252\,699\,329\,431\,870\,338}\right)^{23}$$

Decimal approximation:

1.656201617440148937425172690412625436453850020815601047066...

1.65620161744…. 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...

(1/(184117994151827850151728416761687619847730 9 /
180123166801146288014485825269932943187033 8))^1/32

Input:

$$\sqrt[32]{\frac{1}{\frac{1841\,179941\,518278\,501517\,284167\,616876\,198477\,309}{1801\,231668\,011462\,880\,144\,858252\,699329\,431870\,338}}}$$

Result:

$$\sqrt[32]{\frac{28\,590\,978\,857\,324\,807\,621\,346\,956\,392\,052\,848\,124\,926}{263\,025\,705\,931\,182\,643\,073\,897\,738\,230\,982\,314\,068\,187}}\ \sqrt[16]{3}$$

Decimal approximation:

0.999314736533189282124601521920738705750120421622961417551...

0.999314736…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the Omega mesons ($\omega/\omega_3 \mid 5+3 \mid m_{u/d}=255-390 \mid 0.988-1.18$) Regge slope value (0.988) connected to the dilaton scalar field $\mathbf{0.989117352243 = \phi}$

A_1^{**} above the two low-lying pseudo-scalars. (bound states of gluons, or 'glueballs').

A_1^{**}	0.943(39) [2.5]	0.988(38)	0.152(53)
A_4	1.03(10) [2.5]	0.999(32)	0.035(21)

(**Glueball Regge trajectories -** *Harvey Byron Meyer*, Lincoln College -Thesis submitted for the degree of Doctor of Philosophy at the University of Oxford Trinity Term, 2004)

Alternate form:

$$\left(\sqrt[16]{3}\ \sqrt[32]{28\,590\,978\,857\,324\,807\,621\,346\,956\,392\,052\,848\,124\,926}\right.$$
$$\left.263\,025\,705\,931\,182\,643\,073\,897\,738\,230\,982\,314\,068\,187^{31/32}\right)\Big/$$
$$263\,025\,705\,931\,182\,643\,073\,897\,738\,230\,982\,314\,068\,187$$

-

10*((((338489335624434984434 1*2+98757017491716010698603869808070*2^2+
10721617022118294111300879958656795681727*2^3) * (1-2)(1-2^2)(1-2^3))))

Input:

$$-10\left((3\,384\,893\,356\,244\,349\,844\,341\times 2+98\,757\,017\,491\,716\,010\,698\,603\,869\,808\,070\times 2^2+10\,721\,617\,022\,118\,294\,111\,300\,879\,958\,656\,795\,681\,727\times 2^3)(1-2)\left(1-2^2\right)\left(1-2^3\right)\right)$$

Result:

18 012 316 680 114 628 801 448 582 526 993 294 318 703 380

Scientific notation:

$1.801231668011462880144858252699329431870338 \times 10^{43}$

$1.801231668\ldots*10^{43}$ result very near to the value of Planck frequency

1.8549×10^{43} Hz

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.

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