On various Ramanujan formulas applied to some sectors of String Theory and Particle Physics: Further new possible mathematical connections III.

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Abstract

In this research thesis, we have analyzed and deepened various Ramanujan expressions applied to some sectors of String Theory and Particle Physics. We have therefore described further new possible mathematical connections.

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And so $f(q)$ is a Mock ϑ function.

~~where~~ when $q = -e^{-t}$ and $t \to 0$

$$f(q) + \sqrt{\tfrac{\pi}{t}}\, e^{\frac{\pi^2}{24t} - \frac{t}{24}} \to 4.$$

The coeff^t of q^n in $f(q)$ is

$$(-1)^{n-1} \frac{e^{\pi\sqrt{\frac{n}{6} - \frac{1}{144}}}}{2\sqrt{n - \frac{1}{24}}} + O\left(\frac{e^{\frac{\pi}{2}\sqrt{\frac{n}{6} - \frac{1}{144}}}}{\sqrt{n - \frac{1}{24}}}\right)$$

It is inconceivable that a single ϑ function could be found to ~~cast~~ cut out the singu-larities of $f(q)$.

Mock ϑ-functions

$$\phi(q) = 1 + \frac{q}{1+q^2} + \frac{q^4}{(1+q^2)(1+q^4)} + \cdots$$

$$\psi(q) = \frac{q}{1-q} + \frac{q^4}{(1-q)(1-q^3)} + \frac{q^9}{(1-q)(1-q^3)(1-q^5)} + \cdots$$

~~These are~~

$$\chi(q) = 1 + \frac{q}{1-q+q^2} + \frac{q^4}{(1-q+q^2)(1-q^2+q^4)}$$

These ~~are substantially~~ related to $f(q)$ as shown below.

$$2\phi(-q) - f(q) = f(q) + 4\psi(-q)$$

$$= \frac{1 - 2q + 2q^4 - 2q^9 + \cdots}{(1+q)(1+q^2)(1+q^3)\cdots}$$

$$4\chi(q) - f(q) = 3 \cdot \frac{(1 - 2q^3 + 2q^{12} - \cdots)^2}{(1-q)(1-q^2)(1-q^3)\cdots}$$

These are of the 3rd order

Mock ϑ-functions (of 5th order)

$$f(q) = 1 + \frac{q}{1+q} + \frac{q^4}{(1+q)(1+q^2)} + \frac{q^9}{(1+q)(1+q^2)(1+q^3)} + \cdots$$

$$\phi(q) = 1 + q(1+q) + q^4(1+q)(1+q^3) + q^9(1+q)(1+q^3)(1+q^5) + \cdots$$

$$\psi(q) = q + q^3(1+q) + q^6(1+q)(1+q^2) + q^{10}(1+q)(1+q^2)(1+q^3) + \cdots$$

$$\chi(q) = 1 + \frac{q}{1-q^2} + \frac{q^2}{(1-q^3)(1-q^4)} + \frac{q^3}{(1-q^4)(1-q^5)(1-q^6)} + \cdots$$

$$= 1 + \left\{\frac{q}{1-q} + \frac{q^3}{(1-q^2)(1-q^3)} + \frac{q^5}{(1-q^3)(1-q^4)(1-q^5)} + \cdots\right\}$$

https://docplayer.net/60757061-This-story-begins-with-a-cryptic-letter.html

https://googology.wikia.org/wiki/Srinivasa_Ramanujan

From:

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

In approaching the GSO projection, it is very convenient to work with $SO(8)$ level–one characters, which encode the independent sectors of the spectrum with definite spin–statistics properties both in space time and on the string world sheet. These characters are a special case of more general (level–one) $SO(2n)$ characters that is selected by the manifest transverse $SO(8)$ rotation symmetry available in ten–dimensional Minkowski space. One can build indeed four distinct sectors of states acting on the vacua of the antiperiodic (Neveu–Schwarz) or periodic (Ramond) sectors, for both left–moving and right–moving oscillators when they are available. This situation would extend to all $SO(2n)$ groups, where the first two characters, O_{2n} and V_{2n}, would count states built with even or odd numbers of Neveu–Schwarz oscillators acting on the corresponding vacuum. On the other hand the last two characters, S_{2n} and C_{2n}, would count states built acting on the Ramond vacuum with corresponding oscillators while also enforcing opposite choices of alternating chiral projections at all levels. In this fashion, say, S_{2n} would involve left chiral projections at all odd levels and right chiral projections at all even ones, while these projections would all be reversed in C_{2n}. Massive light–cone spectra would then combine nonetheless, as expected for Lorentz–invariant spectra, into non–chiral massive ten–dimensional multiplets. These

characters,

$$
\begin{aligned}
O_{2n} &= \frac{\theta^n\left[{0 \atop 0}\right](0|\tau) + \theta^n\left[{0 \atop 1/2}\right](0|\tau)}{2\,\eta^n(\tau)}\,, \qquad & S_{2n} &= \frac{\theta^n\left[{1/2 \atop 0}\right](0|\tau) + i^{-n}\,\theta^n\left[{1/2 \atop 1/2}\right](0|\tau)}{2\,\eta^n(\tau)}\,,\\
V_{2n} &= \frac{\theta^n\left[{0 \atop 0}\right](0|\tau) - \theta^n\left[{0 \atop 1/2}\right](0|\tau)}{2\,\eta^n(\tau)}\,, \qquad & C_{2n} &= \frac{\theta^n\left[{1/2 \atop 0}\right](0|\tau) - i^{-n}\,\theta^n\left[{1/2 \atop 1/2}\right](0|\tau)}{2\,\eta^n(\tau)}\,,
\end{aligned}
$$
$$
\eta(\tau) \;=\; q^{\frac{1}{24}}\,\prod_{n=1}^{\infty}(1\,-\,q^n)\,, \qquad q \;=\; e^{2\pi i\tau}\,,
$$
$$
\theta\left[{\alpha \atop \beta}\right](z|\tau) \;=\; \sum_{n\in Z}\, q^{\frac{1}{2}\,(n+\alpha)^2}\, e^{i2\pi(n+\alpha)(z-\beta)}\,, \tag{2.1}
$$

are combinations of Jacobi θ–functions with characteristics [16] and the Dedekind η function, which is also needed to encode the contributions of bosonic oscillators. The torus amplitude can be defined working on the complex plane with the two identifications $z \sim z+1$ and $z \sim z+\tau$. The corresponding modular transformations act on τ via the fractional linear transformations

$$
\tau \;\to\; \frac{a\,\tau\;+\;b}{d\,\tau\;+\;d} \qquad (ad\,-\,bc\;=\;1)\,, \tag{2.2}
$$

and can be built out of two generators ($S:\tau\to-\frac{1}{\tau}$, $T:\tau\to\tau+1$). S and T act on the four characters via the two matrices

$$
S \;=\; \frac{1}{2}\begin{pmatrix} 1 & 1 & 1 & 1\\ 1 & 1 & -1 & -1\\ 1 & -1 & i^{-n} & -i^{-n}\\ 1 & -1 & -i^{-n} & i^{-n}\end{pmatrix}\,, \quad T \;=\; e^{-\frac{in\pi}{12}}\begin{pmatrix} 1 & 0 & 0 & 0\\ 0 & -1 & 0 & 0\\ 0 & 0 & e^{\frac{in\pi}{4}} & 0\\ 0 & 0 & 0 & e^{\frac{in\pi}{4}}\end{pmatrix}\,. \tag{2.3}
$$

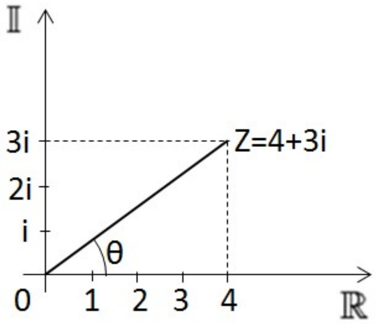
and on the Dedekind function as $\eta\,(-1/\tau) \;=\; (-i\,\tau)^{\frac{1}{2}}\,\eta(\tau)$ and $\eta(\tau+1) \;=\; e^{\frac{i\pi}{12}}\,\eta(\tau)$.

From (2.1)

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

$$\theta\left[\begin{smallmatrix}\alpha\\ \beta\end{smallmatrix}\right](z|\tau) \ = \ \sum_{n\in Z} \ q^{\frac{1}{2}\,(n+\alpha)^2} \ e^{i2\pi(n+\alpha)(z-\beta)} \,, \tag{2.1}$$

We know that the complex number *z* is, for example :



Thence, for n = 2 and z = 1+2i, we obtain:

e^(2Pi)

Input:

$e^{2\pi}$

Decimal approximation:

535.4916555247647365030493295890471814778057976032949155072...

535.4916555…

Property:

$e^{2\pi}$ is a transcendental number

Alternative representations:

$e^{2\pi} = e^{360°}$

$$e^{2\pi} = e^{-2 i \log(-1)}$$

$$e^{2\pi} = \exp^{2\pi}(z) \text{ for } z = 1$$

Series representations:

$$e^{2\pi} = e^{8 \sum_{k=0}^{\infty} (-1)^k/(1+2k)}$$

$$e^{2\pi} = \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{2\pi}$$

$$e^{2\pi} = \left(\frac{1}{\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}}\right)^{2\pi}$$

Integral representations:

$$e^{2\pi} = e^{8 \int_0^1 \sqrt{1-t^2}\, dt}$$

$$e^{2\pi} = e^{4 \int_0^1 1/\sqrt{1-t^2}\, dt}$$

$$e^{2\pi} = e^{4 \int_0^{\infty} 1/(1+t^2)\, dt}$$

535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i))))

Input interpretation:

$$535.491655524^{1/2 (2+1/2)^2}\, e^{2\pi i (2+1/2)(1+2i)}$$

i is the imaginary unit

Result:

$$-7.64871841993... \times 10^{-6}$$

(using the principal branch of the logarithm for complex exponentiation)

-7.64871841993…*10^{-6}

Alternative representations:

$$535.4916555240000^{1/2 (2+1/2)^2}\, e^{2\pi i (2+1/2)(1+2i)} = 535.4916555240000^{1/2 (5/2)^2}\, e^{900\,^{\circ}\, i (1+2i)}$$

$$535.4916555240000^{1/2 (2+1/2)^2}\, e^{2\pi i (2+1/2)(1+2i)} = 535.4916555240000^{1/2 (5/2)^2}\, e^{-5 i^2 (1+2i) \log(-1)}$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 535.4916555240000^{1/2(5/2)^2} e^{10 i^2 (1+2i)\log((1-i)/(1+i))}$$

Series representations:

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 3.36784589933594\times 10^8 \left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{20 i(1+2i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)}$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 3.36784589933594\times 10^8 \left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{20 i(1+2i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)}$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 3.36784589933594\times 10^8 \left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{5 i(1+2i)\sum_{k=1}^{\infty}4^{-k}\left(-1+3^k\right)\zeta(1+k)}$$

Integral representations:

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 3.36784589933594\times 10^8\, e^{10 i(1+2i)\int_0^{\infty} 1/(1+t^2)\,dt}$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 3.36784589933594\times 10^8\, e^{20 i(1+2i)\int_0^{1}\sqrt{1-t^2}\,dt}$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} = 3.36784589933594\times 10^8\, e^{10 i(1+2i)\int_0^{\infty}\sin(t)/t\,dt}$$

535.49165^(1/24) product (1-535.49165^n), n=1 to 4

Input interpretation:

$$\sqrt[24]{535.49165}\prod_{n=1}^{4}\left(1-535.49165^n\right)$$

Result:

2.51427×10^{27}

$2.51427*10^{27}$

We have that:

(((535.49165^(1/24) product (1-535.49165^n), n=1 to 4)))^1/8

Input interpretation:

$$\sqrt[8]{\sqrt[24]{535.49165}\prod_{n=1}^{4}(1-535.49165^n)}$$

Result:

2661.04

2661.04

From the mock theta formula, for n = 197, we obtain:

sqrt(golden ratio) * exp(Pi*sqrt(197/15)) / (2*5^(1/4)*sqrt(197)) – 5

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi\sqrt{\frac{197}{15}}\right)}{2\sqrt[4]{5}\sqrt{197}} - 5$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{197/15}\,\pi}\sqrt{\frac{\phi}{197}}}{2\sqrt[4]{5}} - 5$$

Decimal approximation:

2661.736375678781788646208067609219400883489400918489697902...

2661.73637…

Property:

$$-5 + \frac{e^{\sqrt{197/15}\,\pi}\sqrt{\frac{\phi}{197}}}{2\sqrt[4]{5}}$$ is a transcendental number

Alternate forms:

$$\frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{1970}}\, e^{\sqrt{197/15}\,\pi} - 5$$

$$\frac{\sqrt{\frac{1}{394}\left(1+\sqrt{5}\right) e^{\sqrt{197/15}\,\pi}}}{2\sqrt[4]{5}} - 5$$

$$\frac{5^{3/4}\sqrt{394\left(1+\sqrt{5}\right)}\, e^{\sqrt{197/15}\,\pi} - 19\,700}{3940}$$

Series representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{197}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{197}} - 5 = \left(-50\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (197-z_0)^k z_0^{-k}}{k!} + 5^{3/4} \exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{197}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right) \Bigg/ \left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(197-z_0)^k z_0^{-k}}{k!}\right) \text{ for not } ((z_0\in\mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{197}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{197}} - 5 = \left(-50\exp\left(i\pi\left\lfloor\frac{\arg(197-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(197-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} + 5^{3/4}\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{197}{15}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{197}{15}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \Bigg/ \left(10\exp\left(i\pi\left\lfloor\frac{\arg(197-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(197-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\exp\left(\pi\sqrt{\frac{197}{15}}\right)}{2\sqrt[4]{5}\sqrt{197}} - 5 = \left(\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(197-z_0)/(2\pi)\rfloor} z_0^{-1/2\lfloor\arg(197-z_0)/(2\pi)\rfloor}\right.$$

$$\left(-50\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(197-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(197-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (197-z_0)^k z_0^{-k}}{k!} + \right.$$

$$5^{3/4}\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{197}{15}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{197}{15}-z_0\right)/(2\pi)\right\rfloor\right)}\right.$$

$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{197}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}$$

$$\left.\left. z_0^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\right)\Big/$$

$$\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(197-z_0)^k z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

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

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

We note that:

(((535.49165^(1/24) product (1-535.49165^n), n=1 to 4)))^1/8 + 34

where 34 is a Fibonacci number

Input interpretation:

$$\sqrt[8]{\sqrt[24]{535.49165}\prod_{n=1}^{4}(1-535.49165^n)} + 34$$

Result:

2695.04

2695.04 result practically equal to the rest mass of charmed Omega baryon 2695.2

2*(((535.49165^(1/24) product (1-535.49165^n), n=1 to 4)))

Input interpretation:

$$2\left(\sqrt[24]{535.49165}\ \prod_{n=1}^{4}(1-535.49165^n)\right)$$

Result:

5.02854×10^{27}

$5.02854*10^{27}$

((535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i)))))) + i^(-2) * ((535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i-1/2))))))

Input interpretation:

$$535.491655524^{1/2\,(2+1/2)^2}\ e^{2\pi i\,(2+1/2)(1+2i)}+\frac{535.491655524^{1/2\,(2+1/2)^2}\ e^{2\pi i\,(2+1/2)(1+2i-1/2)}}{i^2}$$

i is the imaginary unit

Result:

$-7.64871841993\ldots\times 10^{-6}-7.64871841993\ldots\times 10^{-6}\,i$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 0.0000108169213242$ (radius), $\theta = -135.000000000°$ (angle)

0.0000108169213242

Alternative representations:

$$535.4916555240000^{1/2\,(2+1/2)^2}\ e^{2\pi i\,(2+1/2)(1+2i)}+\frac{535.4916555240000^{1/2\,(2+1/2)^2}\ e^{2\pi i\,(2+1/2)(1+2i-1/2)}}{i^2}=535.4916555240000^{1/2\,(5/2)^2}\ e^{-5i^2\,(1+2i)\log(-1)}+\frac{535.4916555240000^{1/2\,(5/2)^2}\ e^{-5i^2\,(1/2+2i)\log(-1)}}{i^2}$$

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{535.4916555240000^{1/2(5/2)^2} e^{900^\circ i(1+2i)} + 535.4916555240000^{1/2(5/2)^2} e^{900^\circ i(1/2+2i)}}{i^2}$$

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{535.4916555240000^{1/2(5/2)^2} e^{10 i^2 (1+2i)\log((1-i)/(1+i))} + 535.4916555240000^{1/2(5/2)^2} e^{10 i^2 \left(\frac{1}{2}+2i\right)\log\left(\frac{1-i}{1+i}\right)}}{i^2}$$

Series representations:

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(3.36784589933594\times 10^8\, i^2 \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{20 i(1+2i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)} + 3.36784589933594\times 10^8 \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{10 i(1+4i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)$$

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(3.36784589933594\times 10^8\, i^2 \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}\right)^{20 i(1+2i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)} + 3.36784589933594\times 10^8 \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}\right)^{10 i(1+4i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)$$

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(3.36784589933594\times 10^8\, i^2 \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{20 i(1+2i)\sum_{k=1}^{\infty}\tan^{-1}(1/F_{1+2k})} + 3.36784589933594\times 10^8 \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{10 i(1+4i)\sum_{k=1}^{\infty}\tan^{-1}(1/F_{1+2k})}\right)$$

Integral representations:

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + \frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000\left(3.36784589933594\times 10^8 e^{5i(1+4i)\int_0^\infty 1/(1+t^2)dt} + 3.36784589933594\times 10^8 e^{10i(1+2i)\int_0^\infty 1/(1+t^2)dt} i^2\right)$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + \frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000\left(3.36784589933594\times 10^8 e^{10i(1+4i)\int_0^1 \sqrt{1-t^2}\,dt} + 3.36784589933594\times 10^8 e^{20i(1+2i)\int_0^1 \sqrt{1-t^2}\,dt} i^2\right)$$

$$535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + \frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000\left(3.36784589933594\times 10^8 e^{5i(1+4i)\int_0^\infty \sin(t)/t\,dt} + 3.36784589933594\times 10^8 e^{10i(1+2i)\int_0^\infty \sin(t)/t\,dt} i^2\right)$$

Or:

((535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i)))))) - i^(-2) * ((535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i-1/2))))))

Input interpretation:

$$535.491655524^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} - \frac{535.491655524^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}$$

i is the imaginary unit

Result:

$-7.64871841993... \times 10^{-6} + 7.64871841993... \times 10^{-6} i$

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 0.0000108169213242$ (radius), $\theta = 135.000000000°$ (angle)

0.0000108169213242

Alternative representations:

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} - 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{535.4916555240000^{1/2(5/2)^2} e^{-5i^2(1+2i)\log(-1)} - 535.4916555240000^{1/2(5/2)^2} e^{-5i^2(1/2+2i)\log(-1)}}{i^2}$$

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} - 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{535.4916555240000^{1/2(5/2)^2} e^{900^\circ i(1+2i)} - 535.4916555240000^{1/2(5/2)^2} e^{900^\circ i(1/2+2i)}}{i^2}$$

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} - 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{535.4916555240000^{1/2(5/2)^2} e^{10i^2(1+2i)\log((1-i)/(1+i))} - 535.4916555240000^{1/2(5/2)^2} e^{10i^2\left(\frac{1}{2}+2i\right)\log\left(\frac{1-i}{1+i}\right)}}{i^2}$$

Series representations:

$$\frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} - 535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000\left(3.36784589933594\times10^8\, i^2\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{20i(1+2i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)} - 3.36784589933594\times10^8\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{10i(1+4i)\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)$$

$$535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} - \frac{535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i - 1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(3.36784589933594 \times 10^8 i^2 \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}\right)^{20 i (1+2 i) \sum_{k=0}^{\infty} (-1)^k/(1+2 k)} - 3.36784589933594 \times 10^8 \left(\sum_{k=0}^{\infty} \frac{(-1+k)^2}{k!}\right)^{10 i (1+4 i) \sum_{k=0}^{\infty} (-1)^k/(1+2 k)}\right)$$

$$535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} - \frac{535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i - 1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(3.36784589933594 \times 10^8 i^2 \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{20 i (1+2 i) \sum_{k=1}^{\infty} \tan^{-1}(1/F_{1+2 k})} - 3.36784589933594 \times 10^8 \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{10 i (1+4 i) \sum_{k=1}^{\infty} \tan^{-1}(1/F_{1+2 k})}\right)$$

Integral representations:

$$535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} - \frac{535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i - 1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(-3.36784589933594 \times 10^8 e^{5 i (1+4 i) \int_0^{\infty} 1/(1+t^2) dt} + 3.36784589933594 \times 10^8 e^{10 i (1+2 i) \int_0^{\infty} 1/(1+t^2) dt} i^2\right)$$

$$535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} - \frac{535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i - 1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(-3.36784589933594 \times 10^8 e^{10 i (1+4 i) \int_0^1 \sqrt{1-t^2} dt} + 3.36784589933594 \times 10^8 e^{20 i (1+2 i) \int_0^1 \sqrt{1-t^2} dt} i^2\right)$$

$$535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} - \frac{535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i - 1/2)}}{i^2} = \frac{1}{i^2} 1.00000000000000 \left(-3.36784589933594 \times 10^8 e^{5 i (1+4 i) \int_0^{\infty} \sin(t)/t \, dt} + 3.36784589933594 \times 10^8 e^{10 i (1+2 i) \int_0^{\infty} \sin(t)/t \, dt} i^2\right)$$

0.0000108169213242 / ((((2*(((535.49165^(1/24) product (1-535.49165^n), n=1 to 4)))))))

Input interpretation:

$$\frac{0.0000108169213242}{2\left(\sqrt[24]{535.49165}\ \prod_{n=1}^{4}(1-535.49165^n)\right)}$$

Result:

$$2.15111\times10^{-33}$$

$2.15111*10^{-33}$

We have also the following expression:

((((1/ 2.15111*10^-33)*1 / 2.51427*10^27)))+(64^2*3)-199-76-29+4

where 199, 76, 29 and 4 are Lucas numbers

Input interpretation:

$$\frac{1}{2.15111\times10^{-33}}\times\frac{1}{2.51427\times10^{27}}+64^2\times3-199-76-29+4$$

Result:

196883.12788200677390750526417178935799843524869256875355598...

196883.127882... result very near to 196884

196884 is a fundamental number of the following j-invariant

$$j(\tau)=q^{-1}+744+196884q+21493760q^2+864299970q^3+20245856256q^4+\cdots$$

(In mathematics, Felix Klein's j-invariant or j function, regarded as a function of a complex variable τ, is a modular function of weight zero for SL(2, Z) defined on the upper half plane of complex numbers. Several remarkable properties of j have to do with its q expansion (Fourier series expansion), written as a Laurent series in terms of $q = e^{2\pi i\tau}$ (the square of the nome), which begins:

$$j(\tau)=q^{-1}+744+196884q+21493760q^2+864299970q^3+20245856256q^4+\cdots$$

Note that j has a simple pole at the cusp, so its q-expansion has no terms below q^{-1}.

All the Fourier coefficients are integers, which results in several almost integers, notably Ramanujan's constant:

$$e^{\pi\sqrt{163}} \approx 640320^3 + 744.$$

The asymptotic formula for the coefficient of q^n is given by

$$\frac{e^{4\pi\sqrt{n}}}{\sqrt{2}\, n^{3/4}},$$

as can be proved by the Hardy–Littlewood circle method)

And:

((((1/ 2.15111*10^-33)*1 / 2.51427*10^27)))

Input interpretation:

$$\frac{1}{2.15111\times 10^{-33}} \times \frac{1}{2.51427\times 10^{27}}$$

Result:

184895.12788200677390750526417178935799843524869256875355598...

184895.1278…

From the following mock formula:

sqrt(golden ratio) * exp(Pi*sqrt(387/15)) / (2*5^(1/4)*sqrt(387)) + (843-29-11-1/golden ratio)

where 843, 29 and 11 are Lucas numbers

we obtain:

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi\sqrt{\frac{387}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{387}} + \left(843 - 29 - 11 - \frac{1}{\phi}\right)$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{129/5}\,\pi}\sqrt{\frac{\phi}{43}}}{6\sqrt[4]{5}} - \frac{1}{\phi} + 803$$

Decimal approximation:

184895.7805618448080830281874280747689901920688788675420087...

184895.78056...

Property:

$$803 + \frac{e^{\sqrt{129/5}\,\pi}\sqrt{\frac{\phi}{43}}}{6\sqrt[4]{5}} - \frac{1}{\phi} \text{ is a transcendental number}$$

Alternate forms:

$$\frac{1}{2}\left(1607-\sqrt{5}\right)+\frac{1}{6}\sqrt{\frac{1}{430}\left(5+\sqrt{5}\right)}\,e^{\sqrt{129/5}\,\pi}$$

$$803-\frac{2}{1+\sqrt{5}}+\frac{\sqrt{\frac{1}{86}\left(1+\sqrt{5}\right)}\,e^{\sqrt{129/5}\,\pi}}{6\sqrt[4]{5}}$$

$$\frac{e^{\sqrt{129/5}\,\pi}\,\phi^{3/2}-6\sqrt[4]{5}\,\sqrt{43}\,(1-803\,\phi)}{6\sqrt[4]{5}\,\sqrt{43}\,\phi}$$

Series representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{387}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{387}}+\left(843-29-11-\frac{1}{\phi}\right)=$$
$$\left(-10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(387-z_0)^k z_0^{-k}}{k!}+8030\,\phi\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(387-z_0)^k z_0^{-k}}{k!}+5^{3/4}\,\phi\right.$$
$$\left.\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{129}{5}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\Bigg/$$
$$\left(10\,\phi\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(387-z_0)^k z_0^{-k}}{k!}\right)\quad\text{for not }((z_0\in\mathbb{R}\text{ and }-\infty<z_0\leq 0))$$

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{387}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{387}}+\left(843-29-11-\frac{1}{\phi}\right)=$$

$$\left(-10\exp\left(i\pi\left\lfloor\frac{\arg(387-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(387-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+\right.$$

$$8030\,\phi\exp\left(i\pi\left\lfloor\frac{\arg(387-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(387-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+$$

$$5^{3/4}\,\phi\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{129}{5}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$

$$\left.\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{129}{5}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(\phi-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/$$

$$\left(10\,\phi\exp\left(i\pi\left\lfloor\frac{\arg(387-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(387-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{387}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{387}}+\left(843-29-11-\frac{1}{\phi}\right)=\left(\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(387-z_0)/(2\pi)\rfloor}z_0^{-1/2\lfloor\arg(387-z_0)/(2\pi)\rfloor}\right.$$

$$\left(-10\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(387-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(387-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(387-z_0)^k\,z_0^{-k}}{k!}+\right.$$

$$8030\,\phi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(387-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(387-z_0)/(2\pi)\rfloor}$$

$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(387-z_0)^k\,z_0^{-k}}{k!}+5^{3/4}\,\phi\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{129}{5}-z_0\right)/(2\pi)\right\rfloor}\right.$$

$$\left.z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{129}{5}-z_0\right)/(2\pi)\right\rfloor\right)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{129}{5}-z_0\right)^k z_0^{-k}}{k!}\right)$$

$$\left.\left.\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\,z_0^{-k}}{k!}\right)\right)\Big/$$

$$\left(10\,\phi\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(387-z_0)^k\,z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

We obtain also:

1/2*(1/(18+1)+1/(18+4))*0.0000108169213242 / ((((2*(((535.49165^(1/24) product (1-535.49165^n), n=1 to 4)))))))

where 18 is a Lucas number

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{18+1}+\frac{1}{18+4}\right)\times\frac{0.0000108169213242}{2\left(\sqrt[24]{535.49165}\ \prod_{n=1}^{4}(1-535.49165^n)\right)}$$

Result:

1.05497×10^{-34}

$1.05497*10^{-34}$

We have also that:

[((535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i)))))) + i^(-2) * 535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i-1/2))))] / (((exp(2Pi)^(1/2(2+1/2)^2)*exp(((2Pi*i(2+1/2)(1+2i)))))))

Input interpretation:

$$\frac{535.491655524^{1/2\,(2+1/2)^2}\ e^{2\pi i\,(2+1/2)(1+2i)}+\frac{535.491655524^{1/2\,(2+1/2)^2}\ e^{2\pi i\,(2+1/2)(1+2i-1/2)}}{i^2}}{\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)}$$

i is the imaginary unit

Result:

1.0000000000... +
1.0000000000... i

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 1.41421356237$ (radius), $\theta = 45.000000000°$ (angle)

1.41421356237 = √2

Alternative representations:

$$\left(535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2i)} + \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2i-1/2)}}{i^2}\right) \Big/ \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right) = \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, w^a + \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, w^a}{i^2}}{\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)}$$

for $\left(a = -\frac{\left(10-\frac{5i}{2}\right)\pi}{\log(w)} \text{ and } a = -\frac{(10-5i)\pi}{\log(w)}\right)$

$$\left(535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2i)} + \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2i-1/2)}}{i^2}\right) \Big/ \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right) = \left(\frac{535.4916555240000^{1/2\,(5/2)^2}\left(1+\frac{2}{-1+\coth\left(\frac{5}{2}i\left(\frac{1}{2}+2i\right)\pi\right)}\right)}{i^2} + 535.4916555240000^{1/2\,(5/2)^2}\left(1+\frac{2}{-1+\coth\left(\frac{5}{2}i(1+2i)\pi\right)}\right)\right) \Big/ \left(\exp(5i(1+2i)\pi)\exp^{\frac{1}{2}\left(\frac{5}{2}\right)^2}(2\pi)\right)$$

$$\left(535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2\,i)} + \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2\,i-1/2)}}{i^2}\right) \Big/ \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2\,i)\right)\right) =$$

$$\left(\frac{535.4916555240000^{1/2\,(5/2)^2}\left(-1+\frac{2}{1-\tanh\left(\frac{5}{2}\,i\left(\frac{1}{2}+2\,i\right)\pi\right)}\right)}{i^2} + 535.4916555240000^{1/2\,(5/2)^2}\left(-1+\frac{2}{1-\tanh\left(\frac{5}{2}\,i\,(1+2\,i)\,\pi\right)}\right)\right) \Big/ \left(\exp(5\,i\,(1+2\,i)\,\pi)\exp^{\frac{1}{2}\left(\frac{5}{2}\right)^2}(2\pi)\right)$$

Series representations:

$$\left(535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2\,i)} + \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2\,i-1/2)}}{i^2}\right) \Big/ \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2\,i)\right)\right) =$$

$$\sum_{k=0}^{\infty}\left(3.36784589933594\times10^{8}\times5^k\, i^2\,(i\,(1+2\,i)\,\pi)^k + 3.36784589933594\times10^{8}\left(\frac{5}{2}\right)^k (i\,(1+4\,i)\,\pi)^k\right) \Big/ \left(i^2\exp^{\frac{25}{8}}(2\pi)\exp(5\,i\,(1+2\,i)\,\pi)\,k!\right)$$

$$\left(535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2\,i)} + \frac{535.4916555240000^{1/2\,(2+1/2)^2}\, e^{2\pi i\,(2+1/2)(1+2\,i-1/2)}}{i^2}\right) \Big/ \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2\,i)\right)\right) =$$

$$\sum_{k=-\infty}^{\infty}\left(3.36784589933594\times10^{8}\, i^2\, I_k(5\,i\,(1+2\,i)\,\pi) + 3.36784589933594\times10^{8}\, I_k\left(\frac{5}{2}\,i\,(1+4\,i)\,\pi\right)\right) \Big/ \left(i^2\exp^{\frac{25}{8}}(2\pi)\exp(5\,i\,(1+2\,i)\,\pi)\right)$$

$$\left(535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} + \frac{535.4916555240000^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i-1/2)}}{i^2}\right) / \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2 \pi) \exp\left(2 \pi i \left(2+\frac{1}{2}\right)(1+2 i)\right)\right) = \sum_{k=-\infty}^{\infty} \left((-1)^k \left(3.36784589933594 \times 10^8 i^2 I_k(-5 i (1+2 i) \pi) + 3.36784589933594 \times 10^8 I_k\left(-\frac{5}{2} i (1+4 i) \pi\right)\right)\right) / \left(i^2 \exp^{\frac{25}{8}}(2 \pi) \exp(5 i (1+2 i) \pi)\right)$$

and:

1/[((535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i)))))) + i^(-2) * 535.491655524^(1/2(2+1/2)^2) * e^(((2Pi*i(2+1/2)(1+2i-1/2))))] [(((exp(2Pi)^(1/2(2+1/2)^2)*exp(((2Pi*i(2+1/2)(1+2i)))))))]

Input interpretation:

$$\frac{1}{535.491655524^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i)} + \frac{535.491655524^{1/2 (2+1/2)^2} e^{2 \pi i (2+1/2)(1+2 i-1/2)}}{i^2}} \left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2 \pi) \exp\left(2 \pi i \left(2+\frac{1}{2}\right)(1+2 i)\right)\right)$$

i is the imaginary unit

Result:

0.50000000000... −
0.50000000000... i

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 0.70710678119$ (radius), $\theta = -45.000000000°$ (angle)

0.70710678119 = 1/√2

Alternative representations:

$$\left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right)\Big/\left(535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i)}+\frac{535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}\right)=\frac{\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)}{535.4916555240000^{1/2(2+1/2)^2}\,w^a+\frac{535.4916555240000^{1/2(2+1/2)^2}\,w^a}{i^2}}$$

$$\text{for}\left(a=-\frac{\left(10-\frac{5i}{2}\right)\pi}{\log(w)}\text{ and }a=-\frac{(10-5i)\pi}{\log(w)}\right)$$

$$\left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right)\Big/\left(535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i)}+\frac{535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}\right)=\left(\exp(5i(1+2i)\pi)\exp^{\frac{1}{2}\left(\frac{5}{2}\right)^2}(2\pi)\right)\Big/\left(\frac{535.4916555240000^{1/2(5/2)^2}\left(1+\frac{2}{-1+\coth\left(\frac{5}{2}i\left(\frac{1}{2}+2i\right)\pi\right)}\right)}{i^2}+535.4916555240000^{1/2(5/2)^2}\left(1+\frac{2}{-1+\coth\left(\frac{5}{2}i(1+2i)\pi\right)}\right)\right)$$

$$\left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right)\Big/\left(535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i)}+\frac{535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}\right)=$$

$$\left(\exp(5i(1+2i)\pi)\exp^{\frac{1}{2}\left(\frac{5}{2}\right)^2}(2\pi)\right)\Big/\left(\frac{535.4916555240000^{1/2(5/2)^2}\left(-1+\frac{2}{1-\tanh\left(\frac{5}{2}i\left(\frac{1}{2}+2i\right)\pi\right)}\right)}{i^2}+535.4916555240000^{1/2(5/2)^2}\left(-1+\frac{2}{1-\tanh\left(\frac{5}{2}i(1+2i)\pi\right)}\right)\right)$$

Series representations:

$$\left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right)\Big/\left(535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i)}+\frac{535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}\right)=\frac{\exp^{\frac{25}{8}}(2\pi)\exp(5i(1+2i)\pi)}{\sum_{k=-\infty}^{\infty}\left(3.36784589933594\times10^8\,I_k(5i(1+2i)\pi)+\frac{3.36784589933594\times10^8\,I_k\left(\frac{5}{2}i(1+4i)\pi\right)}{i^2}\right)}$$

$$\left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right)\Big/\left(535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i)}+\frac{535.4916555240000^{1/2(2+1/2)^2}\,e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}\right)=\frac{\exp^{\frac{25}{8}}(2\pi)\exp(5i(1+2i)\pi)}{\sum_{k=0}^{\infty}\frac{3.36784589933594\times10^8\times5^k\,i^2\,(i(1+2i)\pi)^k+3.36784589933594\times10^8\left(\frac{5}{2}\right)^k(i(1+4i)\pi)^k}{i^2\,k!}}$$

$$\left(\exp^{\frac{1}{2}\left(2+\frac{1}{2}\right)^2}(2\pi)\exp\left(2\pi i\left(2+\frac{1}{2}\right)(1+2i)\right)\right) \Big/ \left(535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i)} + \frac{535.4916555240000^{1/2(2+1/2)^2} e^{2\pi i(2+1/2)(1+2i-1/2)}}{i^2}\right) =$$

$$\left(\exp^{\frac{25}{8}}(2\pi)\exp(5i(1+2i)\pi)\right) \Big/ \left(\sum_{k=-\infty}^{\infty}(-1)^k \left(3.36784589933594\times10^8 I_k(-5i(1+2i)\pi) + \frac{3.36784589933594\times10^8 I_k\left(-\frac{5}{2}i(1+4i)\pi\right)}{i^2}\right)\right)$$

From:

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

We have that:

Notice that the Klein–bottle amplitude is not invariant under modular transformations. It exhibits nonetheless an interesting behavior if τ_2 is halved, which amounts to referring the measure to its doubly–covering torus, and then an S transformation is performed. This turns the second contribution into a *tree–level* exchange diagram for the closed string spectrum between a pair of crosscaps (real projective planes, or if you will spheres with opposite points identified). The end result reads

$$\widetilde{\mathcal{K}} \;=\; \frac{2^5}{2}\int_0^\infty d\ell\,\frac{V_8\,-\,S_8}{\eta^8}\,[i\ell]\,, \tag{2.17}$$

where the argument of the functions involved is again within square brackets.

Notice that all powers of ℓ have disappeared, as pertains to such a vacuum exchange, since they would signal momentum flow. Now this $\widetilde{\mathcal{K}}$ amplitude is akin, in many respects, to the other two possible types of *tree–level* exchange diagrams, those between a pair of boundaries and between a boundary and a crosscap, $\widetilde{\mathcal{A}}$ and $\widetilde{\mathcal{M}}$,

$$\widetilde{\mathcal{A}} = \frac{2^{-5}}{2}\mathcal{N}^2\int_0^\infty d\ell\,\frac{V_8\,-\,S_8}{\eta^8}\,[i\ell]\,,\quad \widetilde{\mathcal{M}} \;=\; -\,2\,\frac{1}{2}\,\mathcal{N}\int_0^\infty d\ell\,\frac{V_8\,-\,S_8}{\eta^8}\,[i\ell+1/2]\,. \tag{2.18}$$

Both expressions involve the same closed spectrum, but the reader should appreciate a few facts. The first is the presence of a Chan–Paton multiplicity [20] $\mathcal{N}$ associated to each boundary, which thus enters quadratically the first amplitude and linearly the second. The second fact is the presence of a shifted argument in the second contribution $\widetilde{\mathcal{M}}$, consistently with its skew doubly covering torus. The other relevant ingredient is the combinatoric factor of two present in the second expression, while its overall "minus" sign guarantees that the overall contribution to the S_8 sector, proportional to

$$\frac{2^5}{2}\left(1+2^{-5}\mathcal{N}^2\;-\;2\,\times\,2^{-5}\mathcal{N}\right)\,, \tag{2.19}$$

For N = 48, from (2.19), we obtain:

32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48)))

Input:

$$\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)$$

Exact result:

1120

1120

(((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48)))+47)))^1/14

where 47 is a Lucas number

Input:

$$\sqrt[14]{\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)+47}$$

Result:

$$\sqrt[14]{1167}$$

Decimal approximation:

1.6560616101188177294994461450857197551403624771594543115 74...

1.6560616…. result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3$ = 1164,2696 i.e. 1,65578...

1/10^27(((((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48)))+47)))^1/14 + 16/10^3))

Input:

$$\frac{1}{10^{27}}\left(\sqrt[14]{\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)+47}+\frac{16}{10^3}\right)$$

Result:

$$\frac{\frac{2}{125}+\sqrt[14]{1167}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Decimal approximation:

1.6720616101188177294994461450857197551403624771594543... × 10^{-27}

1.6720616…*10^{-27} result practically equal to the proton mass in kg

(((((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48)))+47)))^1/14 + 16/10^3-(47+7)/10^3))

where 47 and 7 are Lucas numbers

Input:

$$\sqrt[14]{\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)+47}+\frac{16}{10^3}-\frac{47+7}{10^3}$$

Result:

$$\sqrt[14]{1167}-\frac{19}{500}$$

Decimal approximation:

1.618061610118817729499446145085719755140362477159454311574...

1.6180616…. result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternate forms:

$$\frac{1}{500}\left(500\sqrt[14]{1167}-19\right)$$

$$\frac{1}{500}\left(\sqrt{\left(1000\left(\text{root of } 1\,000\,000\,000\,000\,000\,000\,000\,x^7 + 2\,527\,000\,000\,000\,000\,000\,000\,x^6 + 2\,736\,741\,000\,000\,000\,000\,000\,x^5 + 1\,646\,605\,835\,000\,000\,000\,000\,x^4 + 594\,424\,706\,435\,000\,000\,000\,x^3 + 128\,752\,391\,413\,821\,000\,000\,x^2 + 15\,493\,204\,433\,463\,127\,000\,x - 71\,228\,027\,343\,749\,999\,999\,999\,200\,993\,314\,217\,115\,879 \text{ near } x = 685.274\right) + 361\right)} - 19\right)$$

Minimal polynomial:

$$61\,035\,156\,250\,000\,000\,000\,000\,000\,000\,000\,000\,000\,x^{14} +$$
$$32\,470\,703\,125\,000\,000\,000\,000\,000\,000\,000\,000\,000\,x^{13} +$$
$$8\,020\,263\,671\,875\,000\,000\,000\,000\,000\,000\,000\,000\,x^{12} +$$
$$1\,219\,080\,078\,125\,000\,000\,000\,000\,000\,000\,000\,000\,x^{11} +$$
$$127\,393\,868\,164\,062\,500\,000\,000\,000\,000\,000\,000\,x^{10} +$$
$$9\,681\,933\,980\,468\,750\,000\,000\,000\,000\,000\,000\,x^{9} +$$
$$551\,870\,236\,886\,718\,750\,000\,000\,000\,000\,000\,x^{8} +$$
$$23\,966\,936\,001\,937\,500\,000\,000\,000\,000\,000\,x^{7} +$$
$$796\,900\,622\,064\,421\,875\,000\,000\,000\,000\,x^{6} +$$
$$20\,188\,149\,092\,298\,687\,500\,000\,000\,000\,x^{5} +$$
$$383\,574\,832\,753\,675\,062\,500\,000\,000\,x^{4} + 5\,300\,306\,779\,868\,964\,500\,000\,000\,x^{3} +$$
$$50\,352\,914\,408\,755\,162\,750\,000\,x^{2} + 294\,370\,884\,235\,799\,413\,000\,x -$$
$$71\,228\,027\,343\,749\,999\,999\,999\,200\,993\,314\,217\,115\,879$$

32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48))) +123 – 11

where 123 and 11 are Lucas numbers

Input:

$$\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)+123-11$$

Exact result:

$$1232$$

1232 result practically equal to the rest mass of Delta baryon 1232

((((((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48))))))-199-76-Pi)))^1/14

where 199 and 76 are Lucas numbers

Input:

$$\sqrt[14]{\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)-199-76-\pi}$$

Exact result:

$$\sqrt[14]{845-\pi}$$

Decimal approximation:

1.6178775424785222968322252981869992540195654574201348384 86...

1.6178775424… result that is a good approximation to the value of the golden ratio 1,618033988749...

Property:

$\sqrt[14]{845-\pi}$ is a transcendental number

All 14th roots of 845 - π:

$\sqrt[14]{845-\pi}\; e^0 \approx 1.61788$ (real, principal root)

$\sqrt[14]{845-\pi}\; e^{(i\pi)/7} \approx 1.45766+0.7020\, i$

$\sqrt[14]{845-\pi}\; e^{(2i\pi)/7} \approx 1.0087+1.2649\, i$

$\sqrt[14]{845-\pi}\; e^{(3i\pi)/7} \approx 0.36001+1.57731\, i$

$\sqrt[14]{845-\pi}\; e^{(4i\pi)/7} \approx -0.3600+1.57731\, i$

Alternative representations:

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{-275-180^\circ+16\left(1-\frac{96}{2^5}+\frac{48^2}{2^5}\right)}$$

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{-275+i\log(-1)+16\left(1-\frac{96}{2^5}+\frac{48^2}{2^5}\right)}$$

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{-275-\cos^{-1}(-1)+16\left(1-\frac{96}{2^5}+\frac{48^2}{2^5}\right)}$$

Series representations:

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{845-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}$$

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} =$$
$$\sqrt[14]{845+\sum_{k=0}^{\infty}\frac{4(-1)^k\, 1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}}$$

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} =$$
$$\sqrt[14]{845-\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)}$$

Integral representations:

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{845-4\int_0^1\sqrt{1-t^2}\,dt}$$

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{845-2\int_0^{\infty}\frac{1}{1+t^2}\,dt}$$

$$\sqrt[14]{\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32-199-76-\pi} = \sqrt[14]{845-2\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt}$$

(((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48))))))+521+76+11

where 521, 76 and 11 are Lucas numbers

Input:

$$\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)+521+76+11$$

Exact result:

1728

1728

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

((((((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48))))))+521+76+11)))^1/15

Input:

$$\sqrt[15]{\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)+521+76+11}$$

Result:

$$2^{2/5}\sqrt[5]{3}$$

Decimal approximation:

1.643751829517225762308497936230979517383492589945475200411...

$1.643751829\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Pi*ln((((((32/2(((1+2^(-5)*48^2 – 2*2^(-5)*48)))))))))+(((sqrt5+1)/2))

Input:

$$\pi \log\left(\frac{32}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)\right)+\frac{1}{2}\left(\sqrt{5}+1\right)$$

log(x) is the natural logarithm

Exact result:

$$\frac{1}{2}\left(1+\sqrt{5}\right)+\pi \log(1120)$$

Decimal approximation:

23.675419791197760001198170877591812222599211918219585227 56...

23.675419… result very near to the black hole entropy 23.6954

Alternate forms:

$$\frac{1}{2}\left(1+\sqrt{5}+2\pi\log(1120)\right)$$

$$\frac{1}{2}+\frac{\sqrt{5}}{2}+\pi\log(1120)$$

$$\frac{1}{2}+\frac{\sqrt{5}}{2}+\pi(5\log(2)+\log(35))$$

Alternative representations:

$$\pi\log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=\pi\log_e\left(16\left(1-\frac{96}{2^5}+\frac{48^2}{2^5}\right)\right)+\frac{1}{2}\left(1+\sqrt{5}\right)$$

$$\pi\log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$
$$\pi\log(a)\log_a\left(16\left(1-\frac{96}{2^5}+\frac{48^2}{2^5}\right)\right)+\frac{1}{2}\left(1+\sqrt{5}\right)$$

$$\pi\log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$
$$-\pi\,\text{Li}_1\left(1-16\left(1-\frac{96}{2^5}+\frac{48^2}{2^5}\right)\right)+\frac{1}{2}\left(1+\sqrt{5}\right)$$

Series representations:

$$\pi\log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=\frac{1}{2}+\frac{\sqrt{5}}{2}+\pi\log(1119)-\pi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1119}\right)^k}{k}$$

$$\pi\log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$
$$\frac{1}{2}+\frac{\sqrt{5}}{2}+2i\pi^2\left\lfloor\frac{\arg(1120-x)}{2\pi}\right\rfloor+\pi\log(x)-\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1120-x)^k x^{-k}}{k}\quad\text{for } x<0$$

$$\pi \log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$
$$\frac{1}{2}+\frac{\sqrt{5}}{2}+2\,i\,\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor+\pi\log(z_0)-\pi\sum_{k=1}^{\infty}\frac{(-1)^k\,(1120-z_0)^k\,z_0^{-k}}{k}$$

Integral representations:

$$\pi \log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=\frac{1}{2}+\frac{\sqrt{5}}{2}+\pi\int_1^{1120}\frac{1}{t}\,dt$$

$$\pi \log\left(\frac{1}{2}\left(1+\frac{48^2}{2^5}-\frac{2\times 48}{2^5}\right)32\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$
$$\frac{1}{2}+\frac{\sqrt{5}}{2}-\frac{i}{2}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1119^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

Now, we have that:

$$V=\exp\left(\sqrt{6}\phi\right)+\exp\left(\sqrt{6}\,\gamma\,\phi\right),\ \text{with } \gamma\simeq 1/12$$

exp((sqrt6)x)+exp((sqrt6)*1/12*x)

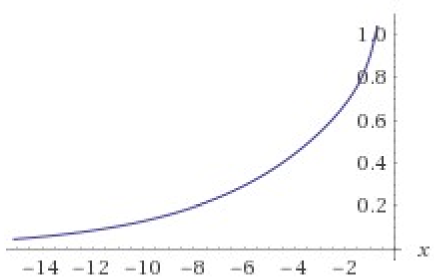
Input:

$$\exp\left(\sqrt{6}\,x\right)+\exp\left(\sqrt{6}\times\frac{1}{12}\,x\right)$$

Exact result:

$$e^{x/\left(2\sqrt{6}\right)}+e^{\sqrt{6}\,x}$$

Plot:



(x from −15.1 to 0)

Alternate form:

$$e^{x/(2\sqrt{6})}\left(e^{x/(2\sqrt{6})}+1\right)\left(e^{\sqrt{2/3}\,x}+e^{2\sqrt{2/3}\,x}-e^{1/2\sqrt{3/2}\,x}+e^{\sqrt{3/2}\,x}-e^{3/2\sqrt{3/2}\,x}-e^{x/(2\sqrt{6})}+e^{x/\sqrt{6}}-e^{(5x)/(2\sqrt{6})}-e^{(7x)/(2\sqrt{6})}+e^{(5x)/\sqrt{6}}+1\right)$$

Alternate form assuming x is real:

$$\sqrt{e^{x/\sqrt{6}}+e^{\sqrt{6}\,x}}$$

Roots:

$$x = 2\,i\sqrt{6}\,(2\pi n+\pi),\quad n\in\mathbb{Z}$$

$$x = \frac{2}{11}\,i\sqrt{6}\,(22\pi n-9\pi),\quad n\in\mathbb{Z}$$

$$x = \frac{2}{11}\,i\sqrt{6}\,(22\pi n-7\pi),\quad n\in\mathbb{Z}$$

$$x = \frac{2}{11}\,i\sqrt{6}\,(22\pi n-5\pi),\quad n\in\mathbb{Z}$$

$$x = \frac{2}{11}\,i\sqrt{6}\,(22\pi n-3\pi),\quad n\in\mathbb{Z}$$

$\mathbb{Z}$ is the set of integers

Roots:

$$x \approx 4.8990\,i\,(6.2832\,n+3.1416),\quad n\in\mathbb{Z}$$

$$x \approx 0.44536\,i\,(69.115\,n-28.274),\quad n\in\mathbb{Z}$$

$$x \approx 0.44536\,i\,(69.115\,n-21.991),\quad n\in\mathbb{Z}$$

$$x \approx 0.44536\,i\,(69.115\,n-15.708),\quad n\in\mathbb{Z}$$

$$x \approx 0.44536\,i\,(69.115\,n-9.4248),\quad n\in\mathbb{Z}$$

$\mathbb{Z}$ is the set of integers

Properties as a real function:

Domain

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

Range

$\{y\in\mathbb{R} : y>0\}$ (all positive real numbers)

Injectivity

injective (one-to-one)

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

Periodicity:

periodic in x with period $4 i \sqrt{6} \pi$

Series expansion at x = 0:

$$2 + \frac{13 x}{2 \sqrt{6}} + \frac{145 x^2}{48} + \frac{1729 x^3}{288 \sqrt{6}} + \frac{20\,737 x^4}{13\,824} + O\left(x^5\right)$$

(Taylor series)

Derivative:

$$\frac{d}{dx}\left(\exp\left(\sqrt{6}\, x\right) + \exp\left(\frac{\sqrt{6}\, x}{12}\right)\right) = \frac{e^{x/\left(2 \sqrt{6}\right)} + 12\, e^{\sqrt{6}\, x}}{2 \sqrt{6}}$$

Indefinite integral:

$$\int \left(e^{x/\left(2 \sqrt{6}\right)} + e^{\sqrt{6}\, x}\right) dx = \frac{12\, e^{x/\left(2 \sqrt{6}\right)} + e^{\sqrt{6}\, x}}{\sqrt{6}} + \text{constant}$$

Limit:

$$\lim_{x \to -\infty} \left(e^{x/\left(2 \sqrt{6}\right)} + e^{\sqrt{6}\, x}\right) = 0$$

Series representations:

$$\exp\left(\sqrt{6}\, x\right) + \exp\left(\frac{\sqrt{6}\, x}{12}\right) = \sum_{k=0}^{\infty} \frac{2^{-(3k)/2} \times 3^{-k/2} \left(1 + 12^k\right) x^k}{k!}$$

$$\exp\left(\sqrt{6}\, x\right) + \exp\left(\frac{\sqrt{6}\, x}{12}\right) = \sum_{k=0}^{\infty} \left(\frac{24^{-k}\, x^{2k} \left(1 + 2k + \frac{x}{2 \sqrt{6}}\right)}{(1 + 2k)!} + \frac{6^k\, x^{2k} \left(1 + 2k + \sqrt{6}\, x\right)}{(1 + 2k)!}\right)$$

$$\exp\left(\sqrt{6}\, x\right) + \exp\left(\frac{\sqrt{6}\, x}{12}\right) =$$
$$\sum_{k=0}^{\infty} \frac{2^{-1/2-3k} \times 3^{-1/2-k}\, x^{-1+2k} \left(2 \left(12 + 144^k\right) k + \sqrt{6} \left(1 + 144^k\right) x\right)}{(2k)!}$$

Definite integral over a half-period:

$$\int_0^{2 i \sqrt{6} \pi} \left(e^{x/\left(2 \sqrt{6}\right)} + e^{\sqrt{6}\, x}\right) dx = -4 \sqrt{6} \approx -9.79796$$

From

$x = 2 i \sqrt{6} (2 \pi n + \pi), \quad n \in \mathbb{Z}$

for n = 1, we obtain:

Input:

$2 i \sqrt{6} (\pi + 2 \pi)$

i is the imaginary unit

Result:

$6 i \sqrt{6} \pi$

Decimal approximation:

46.17179388582710743958530894815623081282138403230732363165... i

46.1717938...i

Property:

$6 i \sqrt{6} \pi$ is a transcendental number

Polar coordinates:

$r \approx 46.1718$ (radius), $\theta = 90°$ (angle)

46.1718

Series representations:

$$2 i \sqrt{6} (\pi + 2 \pi) = 6 i \pi \sqrt{5} \sum_{k=0}^{\infty} 5^{-k} \binom{\frac{1}{2}}{k}$$

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

$$2 i \sqrt{6} (\pi + 2 \pi) = \frac{3 i \pi \sum_{j=0}^{\infty} \text{Res}_{s=-\frac{1}{2}+j} 5^{-s} \Gamma\left(-\frac{1}{2} - s\right) \Gamma(s)}{\sqrt{\pi}}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

$\Gamma(x)$ is the gamma function

$\text{Res}_{z=z_0} f$ is a complex residue

Thence, we have:

exp((sqrt6)*46.1718)+exp((sqrt6)*1/12*46.1718)

Input interpretation:

$$\exp\left(\sqrt{6} \times 46.1718\right) + \exp\left(\sqrt{6} \times \frac{1}{12} \times 46.1718\right)$$

Result:

$$1.310856773662601537254290410595490460223177526409661 3\ldots \times 10^{49}$$

1.3108567736...*10^{49}

from which:

ln(((exp((sqrt6)*46.1718)+exp((sqrt6)*1/12*46.1718))))+29-Pi+1/golden ratio

where 29 is a Lucas number

Input interpretation:

$$\log\left(\exp\left(\sqrt{6} \times 46.1718\right) + \exp\left(\sqrt{6} \times \frac{1}{12} \times 46.1718\right)\right) + 29 - \pi + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Result:

139.574...

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

Alternative representations:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+29-\pi+\frac{1}{\phi}=$$
$$29-\pi+\log_e\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)+\frac{1}{\phi}$$

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+29-\pi+\frac{1}{\phi}=$$
$$29-\pi+\log(a)\log_a\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)+\frac{1}{\phi}$$

Series representation:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+29-\pi+\frac{1}{\phi}=$$
$$29+\frac{1}{\phi}-\pi+\log\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)-$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-k}}{k}$$

Integral representations:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+29-\pi+\frac{1}{\phi}=$$
$$29+\frac{1}{\phi}-\pi+\int_1^{\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)}\frac{1}{t}\,dt$$

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+29-\pi+\frac{1}{\phi}=29+\frac{1}{\phi}-\pi+\frac{1}{2\,i\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

ln(((exp((sqrt6)*46.1718)+exp((sqrt6)*1/12*46.1718))))+11+golden ratio

where 11 is a Lucas number

Input interpretation:

$$\log\left(\exp\left(\sqrt{6}\times 46.1718\right)+\exp\left(\sqrt{6}\times\frac{1}{12}\times 46.1718\right)\right)+11+\phi$$

log(x) is the natural logarithm

ϕ is the golden ratio

Result:

125.715...

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

Alternative representations:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+11+\phi=11+\phi+\log_e\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)$$

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+11+\phi=11+\phi+\log(a)\log_a\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)$$

Series representation:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+11+\phi = 11+\phi+\log\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-k}}{k}$$

Integral representations:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+11+\phi = 11+\phi+\int_1^{\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)}\frac{1}{t}\,dt$$

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+11+\phi = 11+\phi+\frac{1}{2 i \pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

sqrt(729)*1/2*(((ln(((exp((sqrt6)*46.1718)+exp((sqrt6)*1/12*46.1718))))+18-Pi)))+(((sqrt5+1)/2))

where 18 is a Lucas number and 729 = 9^3 (see Ramanujan cubes)

Input interpretation:

$$\sqrt{729}\times\frac{1}{2}\left(\log\left(\exp\left(\sqrt{6}\times 46.1718\right)+\exp\left(\sqrt{6}\times\frac{1}{12}\times 46.1718\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)$$

$\log(x)$ is the natural logarithm

Result:

1729.02...

1729.02…

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

Alternative representations:

$$\frac{1}{2}\sqrt{729}\left(\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)= \frac{1}{2}\left(1+\sqrt{5}\right)+\frac{1}{2}\left(18-\pi+\log_e\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)\right)\sqrt{729}$$

$$\frac{1}{2}\sqrt{729}\left(\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)= \frac{1}{2}\left(1+\sqrt{5}\right)+\frac{1}{2}\left(18-\pi+\log(a)\log_a\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)\right)\sqrt{729}$$

Series representations:

$$\frac{1}{2}\sqrt{729}\left(\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$

$$\frac{1}{2}\left(1+\exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+\right.$$
$$18\exp\left(i\pi\left\lfloor\frac{\arg(729-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(729-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}-$$
$$\pi\exp\left(i\pi\left\lfloor\frac{\arg(729-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(729-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+$$
$$\exp\left(i\pi\left\lfloor\frac{\arg(729-x)}{2\pi}\right\rfloor\right)\log\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)$$
$$\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(729-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}-$$
$$\exp\left(i\pi\left\lfloor\frac{\arg(729-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_2!\,k_1}(-1)^{k_1+k_2}(729-x)^{k_2}$$
$$x^{-k_2}\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-k_1}$$
$$\left.\left(-\frac{1}{2}\right)_{k_2}\right)\quad\text{for }(x\in\mathbb{R}\text{ and }x<0)$$

$$\frac{1}{2}\sqrt{729}\left(\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$

$$\frac{1}{2}\left(1+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (5-z_0)^k z_0^{-k}}{k!}+\right.$$
$$18\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor}$$
$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (729-z_0)^k z_0^{-k}}{k!}-$$
$$\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (729-z_0)^k z_0^{-k}}{k!}+$$
$$\log\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor}$$
$$z_0^{1/2+1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (729-z_0)^k z_0^{-k}}{k!}-$$
$$\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(729-z_0)/(2\pi)\rfloor}$$
$$\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_2!\,k_1}(-1)^{k_1+k_2}\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-k_1}$$
$$\left.\left(-\frac{1}{2}\right)_{k_2}(729-z_0)^{k_2} z_0^{-k_2}\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

i is the imaginary unit

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

Integral representations:

$$\frac{1}{2}\sqrt{729}\left(\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$
$$\frac{1}{2}+\frac{\sqrt{5}}{2}+9\sqrt{729}-\frac{\pi\sqrt{729}}{2}+\frac{\sqrt{729}}{2}\int_1^{\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)}\frac{1}{t}\,dt$$

$$\frac{1}{2}\sqrt{729}\left(\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)+18-\pi\right)+\frac{1}{2}\left(\sqrt{5}+1\right)=$$

$$\frac{1}{2}+\frac{\sqrt{5}}{2}+9\sqrt{729}-\frac{\pi\sqrt{729}}{2}+$$

$$\frac{\sqrt{729}}{4 i \pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$

for $-1 < \gamma < 0$

we have also that:

3*(((2 i sqrt(6) (π + 2 π)))) + (1/golden ratio)i

Input:

$$3\left(2 i\sqrt{6}\ (\pi+2\pi)\right)+\frac{1}{\phi}\,i$$

i is the imaginary unit

ϕ is the golden ratio

Result:

$$\frac{i}{\phi}+18 i\sqrt{6}\ \pi$$

Decimal approximation:

139.1334156462312171669605136788343305561844612767277337570... i

Property:

$\frac{i}{\phi}+18 i\sqrt{6}\ \pi$ is a transcendental number

Polar coordinates:

$r \approx 139.133$ (radius), $\theta = 90°$ (angle)

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

Alternate forms:

$$\frac{1}{2}\left(i\left(\sqrt{5}-1\right)+i\,36\sqrt{6}\ \pi\right)$$

$$\frac{i\left(18\sqrt{6}\,\pi\,\phi+1\right)}{\phi}$$

$$\frac{2\,i}{1+\sqrt{5}}+18\,i\sqrt{6}\,\pi$$

Series representations:

$$3\times 2\left(i\sqrt{6}\,(\pi+2\,\pi)\right)+\frac{i}{\phi}=\frac{i}{\phi}+18\,i\,\pi\sqrt{5}\sum_{k=0}^{\infty}5^{-k}\binom{\frac{1}{2}}{k}$$

$$3\times 2\left(i\sqrt{6}\,(\pi+2\,\pi)\right)+\frac{i}{\phi}=\frac{i}{\phi}+18\,i\,\pi\sqrt{5}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}$$

$$3\times 2\left(i\sqrt{6}\,(\pi+2\,\pi)\right)+\frac{i}{\phi}=\frac{i}{\phi}+\frac{9\,i\,\pi\sum_{j=0}^{\infty}\mathrm{Res}_{s=-\frac{1}{2}+j}\,5^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

$\Gamma(x)$ is the gamma function

$\mathrm{Res}_{z=z_0} f$ is a complex residue

3*(((2 i sqrt(6) (π + 2 π)))) - 13i

where 13 is a Fibonacci number

Input:

$$3\left(2\,i\sqrt{6}\,(\pi+2\,\pi)\right)-13\,i$$

i is the imaginary unit

Result:

$$-13\,i+18\,i\sqrt{6}\,\pi$$

Decimal approximation:

125.5153816574813223187559268444686924384641520969219708949... i

Property:

$-13 i + 18 i \sqrt{6}\, \pi$ is a transcendental number

Polar coordinates:

$r \approx 125.515$ (radius), $\theta = 90°$ (angle)

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

Alternate form:

$i\left(18 \sqrt{6}\, \pi - 13\right)$

Series representations:

$$3 \times 2\left(i \sqrt{6}\, (\pi + 2\pi)\right) - i\, 13 = -13 i + 18 i \pi \sqrt{5} \sum_{k=0}^{\infty} 5^{-k} \binom{\frac{1}{2}}{k}$$

$$3 \times 2\left(i \sqrt{6}\, (\pi + 2\pi)\right) - i\, 13 = -13 i + 18 i \pi \sqrt{5} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{5}\right)^k \left(-\frac{1}{2}\right)_k}{k!}$$

$$3 \times 2\left(i \sqrt{6}\, (\pi + 2\pi)\right) - i\, 13 = -13 i + \frac{9 i \pi \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 5^{-s}\, \Gamma\left(-\frac{1}{2} - s\right) \Gamma(s)}{\sqrt{\pi}}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

$\Gamma(x)$ is the gamma function

$\operatorname{Res}_{z=z_0} f$ is a complex residue

From the previous expression:

ln(((exp((sqrt6)*46.1718)+exp((sqrt6)*1/12*46.1718))))

we obtain:

Input interpretation:

$$\log\left(\exp\left(\sqrt{6}\times 46.1718\right)+\exp\left(\sqrt{6}\times\frac{1}{12}\times 46.1718\right)\right)$$

log(x) is the natural logarithm

Result:

113.097...

113.097…

Alternative representations:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)=\log_e\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)$$

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)=\log(a)\log_a\left(\exp\left(46.1718\sqrt{6}\right)+\exp\left(\frac{46.1718\sqrt{6}}{12}\right)\right)$$

Series representation:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)=\log\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-k}}{k}$$

Integral representations:

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)=\int_1^{\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)}\frac{1}{t}\,dt$$

$$\log\left(\exp\left(\sqrt{6}\ 46.1718\right)+\exp\left(\frac{\sqrt{6}\ 46.1718}{12}\right)\right)=$$
$$\frac{1}{2 i \pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\exp\left(3.84765\sqrt{6}\right)+\exp\left(46.1718\sqrt{6}\right)\right)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \text{ for } -1<\gamma<0$$

From the formula for the Coefficients of the '5th order' mock theta function $\psi_1(q)$,

we obtain, for n = 94:

sqrt(golden ratio) * exp(Pi*sqrt(94/15)) / (2*5^(1/4)*sqrt(94)) - 1/golden ratio

Input:

$$\sqrt{\phi}\times\frac{\exp\left(\pi\sqrt{\frac{94}{15}}\right)}{2\sqrt[4]{5}\sqrt{94}}-\frac{1}{\phi}$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{94/15}\,\pi}\sqrt{\frac{\phi}{94}}}{2\sqrt[4]{5}}-\frac{1}{\phi}$$

Decimal approximation:

113.57593674922343019829004412304036040823358853477444448768...

113.5759367…

Property:

$$\frac{e^{\sqrt{94/15}\,\pi}\sqrt{\frac{\phi}{94}}}{2\sqrt[4]{5}}-\frac{1}{\phi} \text{ is a transcendental number}$$

Alternate forms:

$$\frac{1}{2}\left(1-\sqrt{5}\right)+\frac{1}{4}\sqrt{\frac{1}{235}\left(5+\sqrt{5}\right)}\,e^{\sqrt{94/15}\,\pi}$$

$$\frac{e^{\sqrt{94/15}\,\pi}\,\phi^{3/2} - 2\sqrt[4]{5}\,\sqrt{94}}{2\sqrt[4]{5}\,\sqrt{94}\,\phi}$$

$$\frac{\sqrt{\frac{1}{47}\left(1+\sqrt{5}\right)}\,e^{\sqrt{94/15}\,\pi}}{4\sqrt[4]{5}} - \frac{2}{1+\sqrt{5}}$$

Series representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{94}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{94}} - \frac{1}{\phi} = \left(-10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (94-z_0)^k z_0^{-k}}{k!} + 5^{3/4}\,\phi\,\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{94}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right) \Big/ \left(10\,\phi\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(94-z_0)^k z_0^{-k}}{k!}\right) \text{ for not } ((z_0\in\mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{94}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{94}} - \frac{1}{\phi} = \left(-10\exp\left(i\pi\left\lfloor\frac{\arg(94-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k (94-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} + 5^{3/4}\,\phi\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{94}{15}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{94}{15}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \Big/ \left(10\,\phi\exp\left(i\pi\left\lfloor\frac{\arg(94-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(94-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{94}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{94}} - \frac{1}{\phi} = \left(\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(94-z_0)/(2\pi)\rfloor} z_0^{-1/2\lfloor\arg(94-z_0)/(2\pi)\rfloor}\right.$$

$$\left(-10\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(94-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(94-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k\left(-\frac{1}{2}\right)_k (94-z_0)^k z_0^{-k}}{k!} + \right.$$

$$5^{3/4}\,\phi\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{94}{15}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{94}{15}-z_0\right)/(2\pi)\right\rfloor\right)}\right.$$

$$\left.\sum_{k=0}^{\infty} \frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{94}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}$$

$$\left.\left. z_0^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k\left(-\frac{1}{2}\right)_k (\phi-z_0)^k z_0^{-k}}{k!}\right)\right) \Big/$$

$$\left(10\,\phi\sum_{k=0}^{\infty} \frac{(-1)^k\left(-\frac{1}{2}\right)_k (94-z_0)^k z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

From:

Pre – Inflationary Clues from String Theory ?
N. Kitazawa and A. Sagnotti - arXiv:1402.1418v2 [hep-th] 12 Mar 2014

We have the following mock theta function:
(https://en.wikipedia.org/wiki/Mock_modular_form#Order_6)

$$\sigma(q) = \sum_{n\geq 0} \frac{q^{(n+1)(n+2)/2}(-q;q)_n}{(q;q^2)_{n+1}}$$

That is:

(A053271 sequence OEIS)

Sum_{n >= 0} q^((n+1)(n+2)/2) (1+q)(1+q^2)...(1+q^n)/((1-q)(1-q^3)...(1-q^(2n+1)))

We have that:

sum q^((n+1)(n+2)/2) (1+q)(1+q^2)(1+q^n)))/((1-q)(1-q^3)(1-q^(2n+1))), n = 0 to k

$$\sum_{n=0}^{k} \frac{q^{1/2(n+1)(n+2)}(1+q)(1+q^2)(1+q^n)}{(1-q)(1-q^3)(1-q^{2n+1})}$$

$$\sum_{n=0}^{k} \frac{q^{1/2(n+1)(n+2)}(1+q)(1+q^2)(1+q^n)}{(1-q)(1-q^3)(1-q^{2n+1})}$$

For q = 0.5 and n = 2, we develop the above formula in the following way:

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

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

0.086405529953917050691244239631336405529953917050691244239...

0.0864055...

For $\gamma = 0.0864055$

$$\nu = \frac{3}{2}\frac{1-\gamma^2}{1-3\gamma^2}. \qquad (3.16)$$

3/2*(1-0.0864055^2)/(1-3*0.0864055^2)

Input interpretation:

$$\frac{3}{2} \times \frac{1 - 0.0864055^2}{1 - 3 \times 0.0864055^2}$$

Result:

1.522910883093921439394242709663633225297578928036705562644...

1.52291088309...

We note that:

1+1/(((3/2*(1-0.0864055^2)/(1-3*0.0864055^2))))

Input interpretation:

$$1 + \frac{1}{\frac{3}{2} \times \frac{1-0.0864055^2}{1-3\times 0.0864055^2}}$$

Result:

1.656637240629875835748544158314479446022323977121805013088...

1.65663724062.... result very near to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164,2696$ i.e. 1,65578...

We have that:

$\eta_0 = 6$, c = 2.7, ν = 1.52291088309, k = 38

$$P(k) \sim \frac{(k\,\eta_0)^3 \exp\left[\frac{\pi\left(\frac{c}{2}-1\right)\left(\nu^2-\frac{1}{4}\right)}{\sqrt{(k\,\eta_0)^2+(c-1)\left(\nu^2-\frac{1}{4}\right)}}\right]}{\left|\Gamma\left(\nu+\frac{1}{2}+\frac{i\left(\frac{c}{2}-1\right)\left(\nu^2-\frac{1}{4}\right)}{\sqrt{(k\,\eta_0)^2+(c-1)\left(\nu^2-\frac{1}{4}\right)}}\right)\right|^2 \left[(k\,\eta_0)^2+(c-1)\left(\nu^2-\frac{1}{4}\right)\right]^{\nu}}, \qquad (3.22)$$

(38*6)^3 exp((((Pi((2.7/2)-1))(1.5229108^2-1/4)/((38*6)^2+(2.7-1)(1.5229108^2-1/4))^1/2))))

Input interpretation:

$$(38\times 6)^3 \exp\left(\left(\pi\left(\frac{2.7}{2}-1\right)\right)\times\frac{1.5229108^2-\frac{1}{4}}{\sqrt{(38\times 6)^2+(2.7-1)\left(1.5229108^2-\frac{1}{4}\right)}}\right)$$

Result:

$1.197121757835317060201344416400833187016470926223126 20\ldots\times 10^7$

$1.197121757835317\ldots*10^7$

(((((gamma (1.5229108+1/2+((((i((2.7/2)-1))(1.5229108^2-1/4)/((38*6)^2+(2.7-1)(1.5229108^2-1/4))^1/2)))))))))^2

Input interpretation:

$$\Gamma\left(1.5229108+\frac{1}{2}+i\left(\frac{2.7}{2}-1\right)\times\frac{1.5229108^2-\frac{1}{4}}{\sqrt{(38\times 6)^2+(2.7-1)\left(1.5229108^2-\frac{1}{4}\right)}}\right)^2$$

$\Gamma(x)$ is the gamma function

Result:

$\Gamma(2.02291+0.00907538\, i(0.35))^2$

Alternate form:

$$\frac{1}{(222.901 + i(0.35))^2} 12141.4 \left(\left(1.37964\times 10^{-44} \left(2.68462\times 10^6 - 0.000405856 \sqrt{\left(-4927.86 \sqrt{3.71891\times 10^{40}\, i(0.35) + 8.28947\times 10^{42}} - 4.37543\times 10^{19}\right)}\right)^5 - 1.67294\times 10^{-78} \left(-2463.93 \sqrt{\left(-4927.86 \sqrt{3.71891\times 10^{40}\, i(0.35) + 8.28947\times 10^{42}} - 4.37543\times 10^{19}\right)} - 1.62982\times 10^{13}\right)^5\right)!\right)^2$$

$n!$ is the factorial function

(((38*6)^2+(2.7-1)(1.5229108^2-1/4)))^(1.5229108)

Input interpretation:

$$\left((38\times 6)^2 + (2.7-1)\left(1.5229108^2 - \frac{1}{4}\right)\right)^{1.5229108}$$

Result:

$$1.520175\ldots \times 10^7$$

1.520175...*10^7

(((38*6)^2+(2.7-1)(1.5229108^2-1/4)))^(1.5229108) * (((((gamma (1.5229108+1/2+((((i((2.7/2)-1))(1.5229108^2-1/4)/((38*6)^2+(2.7-1)(1.5229108^2-1/4))^1/2)))))))))^2

Input interpretation:

$$\left((38\times 6)^2 + (2.7-1)\left(1.5229108^2 - \frac{1}{4}\right)\right)^{1.5229108} \Gamma\left(1.5229108 + \frac{1}{2} + i\left(\frac{2.7}{2} - 1\right)\times \frac{1.5229108^2 - \frac{1}{4}}{\sqrt{(38\times 6)^2 + (2.7-1)\left(1.5229108^2 - \frac{1}{4}\right)}}\right)^2$$

$\Gamma(x)$ is the gamma function

Result:

$1.52018\times10^7\ \Gamma(2.02291 + 0.00907538\, i(0.35))^2$

Alternate forms:

$1.52018\times10^7\ \Gamma(2.02291 + 0.00907538\, i(0.35))^2 + 0$

$$\frac{1}{(222.901 + i(0.35))^2}\, 1.84571\times10^{11}\left(\left(1.37964\times10^{-44}\left(2.68462\times10^6 - 0.000405856\sqrt{\left(-4927.86\sqrt{3.71891\times10^{40}\, i(0.35) + 8.28947\times10^{42}} - 4.37543\times10^{19}\right)}\right)^5 - 1.67294\times10^{-78}\left(-2463.93\sqrt{\left(-4927.86\sqrt{3.71891\times10^{40}\, i(0.35) + 8.28947\times10^{42}} - 4.37543\times10^{19}\right)} - 1.62982\times10^{13}\right)^5\right)!\right)^2$$

$n!$ is the factorial function

(((1.197121757835317*10^7))) / (((1.52018×10^7 Γ(2.02291 + 0.00907538 i(0.35))^2)))

Input interpretation:

$$\frac{1.197121757835317\times10^7}{1.52018\times10^7\ \Gamma(2.02291 + 0.00907538\, i(0.35))^2}$$

$\Gamma(x)$ is the gamma function

Result:

$$\frac{0.787487}{\Gamma(2.02291 + 0.00907538\, i(0.35))^2}$$

Alternate forms:

$$\frac{0.787487}{\Gamma(2.02291 + 0.00907538\, i(0.35))^2} + 0$$

$$(0.0000648594 (222.901 + i(0.35))^2) / \Bigg(\Bigg(1. \times 10^{-40} \Bigg(453769 - 0.000663892 \sqrt{\Big(-3012.54 \sqrt{1.13442\times 10^{37}\, i(0.35) + 2.52864\times 10^{39}} - 4.67169\times 10^{17}\Big)}\Bigg)^5 - 1.66332\times 10^{-72} \Bigg(-1506.27 \sqrt{\Big(-3012.54 \sqrt{1.13442\times 10^{37}\, i(0.35) + 2.52864\times 10^{39}} - 4.67169\times 10^{17}\Big)} - 1.02953\times 10^{12}\Bigg)^5\Bigg)!\Bigg)^2$$

$n!$ is the factorial function

Multiplying for i the result, we obtain:

0.787487i / ((((Γ(((2.02291 + 0.00907538 i(0.35)))i)^2)))

Input interpretation:

$$0.787487 \times \frac{i}{(\Gamma(2.02291 + 0.00907538\, i \times 0.35)\, i)^2}$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

$-0.00214577\ldots - 0.772120\ldots i$

Polar coordinates:

$r = 0.772123$ (radius), $\theta = -90.1592°$ (angle)

0.772123

Alternative representations:

$$\frac{0.787487\, i}{(\Gamma(2.02291 + 0.00907538\, i\, 0.35)\, i)^2} = \frac{0.787487\, i}{(i\,(1.02291 + 0.00317638\, i)!)^2}$$

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}=\frac{0.787487\,i}{(i\,\Gamma(2.02291+0.00317638\,i,\,0))^2}$$

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}=\frac{0.787487\,i}{\left(i\,(1)_{1.02291+0.00317638\,i}\right)^2}$$

$n!$ is the factorial function

$\Gamma(a,\,x)$ is the incomplete gamma function

$(a)_n$ is the Pochhammer symbol (rising factorial)

Series representations:

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}=\frac{0.787487}{i\left(\sum_{k=0}^{\infty}\frac{0.00317638^k\,i^k\,\Gamma^{(k)}(2.02291)}{k!}\right)^2}$$

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}=\frac{0.787487}{i\left(\sum_{k=0}^{\infty}\frac{(2.02291+0.00317638\,i-z_0)^k\,\Gamma^{(k)}(z_0)}{k!}\right)^2}$$

for $(z_0\notin\mathbb{Z}$ or $z_0>0)$

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}\propto\frac{0.787487\,e^{4.04582+0.00635277\,i}\,(2.02291+0.00317638\,i)^{-3.04582-0.00635277\,i}}{i\exp^2\left(\frac{1}{2}\sum_{k=0}^{\infty}\frac{(2.02291+0.00317638\,i)^{-1-2k}\,B_{2+2k}}{(1+k)(1+2k)}\right)\sqrt{2\pi}^2}$$

for $\infty\to 2.02291$

$\mathbb{Z}$ is the set of integers

B_n is the n^{th} Bernoulli number

Integral representations:

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}=\frac{0.787487}{i\left(\int_0^{\infty}e^{-t}\,t^{1.02291+0.00317638\,i}\,dt\right)^2}$$

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2}=\frac{0.787487}{i\left(\int_0^1\log^{1.02291+0.00317638\,i}\left(\frac{1}{t}\right)dt\right)^2}$$

$$\frac{0.787487\,i}{(\Gamma(2.02291+0.00907538\,i\,0.35)\,i)^2} = \frac{0.787487\exp\left(-2\int_0^1 \frac{1.02291+i\,(0.00317638-0.00317638\,x)-2.02291\,x+x^{2.02291+0.00317638\,i}}{(-1+x)\log(x)}\,dx\right)}{i}$$

((((0.787487i / ((((Γ(((2.02291 + 0.00907538 i(0.35))))i)^2)))))))^1/512

Input interpretation:

$$\sqrt[512]{0.787487\times\frac{i}{(\Gamma(2.02291+0.00907538\,i\times0.35)\,i)^2}}$$

Γ(x) is the gamma function

i is the imaginary unit

Result:

0.99949031... −
0.0030718326... i

Polar coordinates:

$r = 0.999495$ (radius), $\theta = -0.176092°$ (angle)

0.999495 result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

We calculate as follows:

1/4(((log base 0.999495((((0.787487 / ((((Γ(((2.02291 + 0.00907538 (0.35)))))^2))))))))))-Pi-1/golden ratio

Input interpretation:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times0.35)^2}\right)-\pi-\frac{1}{\phi}$$

$\Gamma(x)$ is the gamma function

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

ϕ is the golden ratio

Result:

125.615...

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

Alternative representations:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times0.35)^2}\right)-\pi-\frac{1}{\phi}=-\pi+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(e^{0.0112472}\right)^2}\right)-\frac{1}{\phi}$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times0.35)^2}\right)-\pi-\frac{1}{\phi}=-\pi+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\frac{1.00717}{0.995905}\right)^2}\right)-\frac{1}{\phi}$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times0.35)^2}\right)-\pi-\frac{1}{\phi}=-\pi+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{(1.02609!)^2}\right)-\frac{1}{\phi}$$

Series representations:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times0.35)^2}\right)-\pi-\frac{1}{\phi}=-\frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{0.787487}{\Gamma(2.02609)^2}\right)^k}{k}}{4\log(0.999495)}$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-\pi-\frac{1}{\phi} = -\frac{1}{\phi}-\pi-494.925\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)-0.25\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)\sum_{k=0}^{\infty}(-0.000505)^k\, G(k)$$

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

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-\pi-\frac{1}{\phi} = -\frac{1}{\phi}-\pi-494.925\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)-0.25\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)\sum_{k=0}^{\infty}(-0.000505)^k\, G(k)$$

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

Integral representations:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-\pi-\frac{1}{\phi} = -\frac{1}{\phi}-\pi+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{\infty}e^{-t}\, t^{1.02609}\, dt\right)^2}\right)$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-\pi-\frac{1}{\phi} = -\frac{1}{\phi}-\pi+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{1}\log^{1.02609}\left(\frac{1}{t}\right)dt\right)^2}\right)$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-\pi-\frac{1}{\phi} = -\frac{1}{\phi}-\pi+\frac{1}{4}\log_{0.999495}\left(0.787487\exp\left(-2\int_0^{1}\frac{1.02609-2.02609\,x+x^{2.02609}}{(-1+x)\log(x)}\,dx\right)\right)$$

1/4(((log base 0.999495((((0.787487 / ((((Γ(((2.02291 + 0.00907538 (0.35)))))^2))))))))))+11-1/golden ratio

where 11 is a Lucas number

Input interpretation:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}$$

$\Gamma(x)$ is the gamma function

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

ϕ is the golden ratio

Result:

139.757...

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

Alternative representations:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=11+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{(e^{0.0112472})^2}\right)-\frac{1}{\phi}$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=11+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\frac{1.00717}{0.995905}\right)^2}\right)-\frac{1}{\phi}$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=11+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{(1.02609!)^2}\right)-\frac{1}{\phi}$$

Series representations:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=11-\frac{1}{\phi}-\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{0.787487}{\Gamma(2.02609)^2}\right)^k}{k}}{4\log(0.999495)}$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=$$
$$11-\frac{1}{\phi}-494.925\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)-0.25\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)\sum_{k=0}^{\infty}(-0.000505)^k\,G(k)$$
$$\text{for}\left(G(0)=0 \text{ and } \frac{(-1)^k\,k}{2(1+k)(2+k)}+G(k)=\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=$$
$$11-\frac{1}{\phi}+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\sum_{k=0}^{\infty}\frac{(2.02609-z_0)^k\,\Gamma^{(k)}(z_0)}{k!}\right)^2}\right)\text{ for }(z_0\notin\mathbb{Z}\text{ or }z_0>0)$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=$$
$$\frac{1}{4\phi}\left(-4+44\phi+\phi\log_{0.999495}\left(\frac{0.787487\left(\sum_{k=0}^{\infty}(2.02609-z_0)^k\sum_{j=0}^{k}\frac{(-1)^j\,\pi^{-j+k}\sin\left(\frac{1}{2}\pi(-j+k+2z_0)\right)\Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}\right)^2}{\pi^2}\right)\right)$$

log(x) is the natural logarithm

$\mathbb{Z}$ is the set of integers

Integral representations:

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=$$
$$11-\frac{1}{\phi}+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{\infty}e^{-t}\,t^{1.02609}\,dt\right)^2}\right)$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=$$
$$11-\frac{1}{\phi}+\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{1}\log^{1.02609}\left(\frac{1}{t}\right)dt\right)^2}\right)$$

$$\frac{1}{4}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+11-\frac{1}{\phi}=$$
$$11-\frac{1}{\phi}+\frac{1}{4}\log_{0.999495}\left(0.787487\exp\left(-2\int_0^1\frac{1.02609-2.02609\,x+x^{2.02609}}{(-1+x)\log(x)}\,dx\right)\right)$$

27 * 1/8(((log base 0.999495((((0.787487 / ((((Γ(((2.02291 + 0.00907538 (0.35)))))^2)))))))))))-18

where 18 is a Lucas number

From Wikipedia:

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

Input interpretation:

$$27\times\frac{1}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18$$

$\Gamma(x)$ is the gamma function

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

Result:

1728.56...

1728.56…

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

Alternative representations:

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18 = -18+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(e^{0.0112472}\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18 = -18+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\frac{1.00717}{0.995905}\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18 = -18+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{(1.02609!)^2}\right)$$

Series representations:

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18 = -18-\frac{27\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{0.787487}{\Gamma(2.02609)^2}\right)^k}{k}}{8\log(0.999495)}$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18 = -18-6681.48\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)-3.375\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)\sum_{k=0}^{\infty}(-0.000505)^k G(k)$$
$$\text{for}\left(G(0)=0 \text{ and } \frac{(-1)^k k}{2(1+k)(2+k)}+G(k)=\sum_{j=1}^{k}\frac{(-1)^{1+j}G(-j+k)}{1+j}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18 = -18+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\sum_{k=0}^{\infty}\frac{(2.02609-z_0)^k\,\Gamma^{(k)}(z_0)}{k!}\right)^2}\right) \text{ for } (z_0\notin\mathbb{Z} \text{ or } z_0>0)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18=\frac{9}{8}\left(-16+3\log_{0.999495}\left(\frac{0.787487\left(\sum_{k=0}^{\infty}(2.02609-z_0)^k\sum_{j=0}^{k}\frac{(-1)^j\,\pi^{-j+k}\sin\left(\frac{1}{2}\pi(-j+k+2z_0)\right)\Gamma^{(j)}(1-z_0)}{j!(-j+k)!}\right)^2}{\pi^2}\right)\right)$$

log(x) is the natural logarithm

$\mathbb{Z}$ is the set of integers

Integral representations:

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18=-18+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{\infty}e^{-t}\,t^{1.02609}\,dt\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18=-18+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{1}\log^{1.02609}\left(\frac{1}{t}\right)dt\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)-18=-18+\frac{27}{8}\log_{0.999495}\left(0.787487\exp\left(-2\int_0^1\frac{1.02609-2.02609\,x+x^{2.02609}}{(-1+x)\log(x)}\,dx\right)\right)$$

27 * 1/8(((log base 0.999495((((0.787487 / ((((Γ(((2.02291 + 0.00907538 (0.35)))))^2))))))))))+29+7

where 29 and 7 are Lucas numbers

Input interpretation:

$$27\times\frac{1}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7$$

$\Gamma(x)$ is the gamma function

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

Result:

1782.56…

1782.56… result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

Alternative representations:

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7=36+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{(e^{0.0112472})^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7=36+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\frac{1.00717}{0.995905}\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7=36+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{(1.02609!)^2}\right)$$

Series representations:

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7=36-\frac{27\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{0.787487}{\Gamma(2.02609)^2}\right)^k}{k}}{8\log(0.999495)}$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7 = 36-6681.48\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)-3.375\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)\sum_{k=0}^{\infty}(-0.000505)^k G(k)$$

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

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7 = 36-6681.48\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)-3.375\log\left(\frac{0.787487}{\Gamma(2.02609)^2}\right)\sum_{k=0}^{\infty}(-0.000505)^k G(k)$$

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

Integral representations:

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7 = 36+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{\infty} e^{-t}\, t^{1.02609}\, dt\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7 = 36+\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\left(\int_0^{1}\log^{1.02609}\left(\frac{1}{t}\right)dt\right)^2}\right)$$

$$\frac{27}{8}\log_{0.999495}\left(\frac{0.787487}{\Gamma(2.02291+0.00907538\times 0.35)^2}\right)+29+7 = 36+\frac{27}{8}\log_{0.999495}\left(0.787487\exp\left(-2\int_0^1 \frac{1.02609-2.02609\,x+x^{2.02609}}{(-1+x)\log(x)}\,dx\right)\right)$$

We have also:

(((exp(0.772123))))^8+13+Pi

where 13 is a Fibonacci number

Input interpretation:

$\exp^8(0.772123) + 13 + \pi$

Result:

497.679...

497.679... result practically equal to the rest mass of Kaon meson 497.614

And:

(((exp(0.772123))))^8+13+Pi-golden ratio

Input interpretation:

$\exp^8(0.772123) + 13 + \pi - \phi$

ϕ is the golden ratio

Result:

496.061...

496.061... result concerning the dimension of the gauge group of type I string theory that is 496.

From the mock formula, we obtain for n = 138:

sqrt(golden ratio) * exp(Pi*sqrt(138/15)) / (2*5^(1/4)*sqrt(138))

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{138}{15}}\right)}{2 \sqrt[4]{5} \sqrt{138}}$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{46/5}\,\pi} \sqrt{\frac{\phi}{138}}}{2 \sqrt[4]{5}}$$

Decimal approximation:

497.89774595310419748130766245551037557606102340148600477731...

497.897745… as above

Property:

$$\frac{e^{\sqrt{46/5}\,\pi}\sqrt{\frac{\phi}{138}}}{2\sqrt[4]{5}} \text{ is a transcendental number}$$

Alternate forms:

$$\frac{1}{4}\sqrt{\frac{1}{345}\left(5+\sqrt{5}\right)}\,e^{\sqrt{46/5}\,\pi}$$

$$\frac{\sqrt{\frac{1}{69}\left(1+\sqrt{5}\right)}\,e^{\sqrt{46/5}\,\pi}}{4\sqrt[4]{5}}$$

Series representations:

$$\frac{\sqrt{\phi}\exp\left(\pi\sqrt{\frac{138}{15}}\right)}{2\sqrt[4]{5}\sqrt{138}} = \frac{\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{46}{5}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}}{2\sqrt[4]{5}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(138-z_0)^k z_0^{-k}}{k!}}$$

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

$$\frac{\sqrt{\phi}\exp\left(\pi\sqrt{\frac{138}{15}}\right)}{2\sqrt[4]{5}\sqrt{138}} = \left(\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{46}{5}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{46}{5}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \Bigg/ \left(2\sqrt[4]{5}\exp\left(i\pi\left\lfloor\frac{\arg(138-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(138-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{138}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{138}} =$$

$$\left(\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{46}{5}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{46}{5}-z_0\right)/(2\pi)\right\rfloor\right)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{46}{5}-z_0\right)^k z_0^{-k}}{k!}\right)\right.$$

$$\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(138-z_0)/(2\pi)\rfloor+1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor} z_0^{-1/2\lfloor\arg(138-z_0)/(2\pi)\rfloor+1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}$$

$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\Bigg/\left(2\sqrt[4]{5}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(138-z_0)^k z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

$(a)_n$ is the Pochhammer symbol (rising factorial)

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

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

Appendix

From:

Three-dimensional AdS gravity and extremal CFTs at c = 8m

Spyros D. Avramis, Alex Kehagiasb and Constantina Mattheopoulou

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m	L_0	d	S	S_{BH}
3	1	196883	12.1904	12.5664
	2	21296876	16.8741	17.7715
	3	842609326	20.5520	21.7656
4	2/3	139503	11.8458	11.8477
	5/3	69193488	18.0524	18.7328
	8/3	6928824200	22.6589	23.6954
5	1/3	20619	9.9340	9.3664
	4/3	86645620	18.2773	18.7328
	7/3	24157197490	23.9078	24.7812

m	L_0	d	S	S_{BH}
6	1	42987519	17.5764	17.7715
	2	40448921875	24.4233	25.1327
	3	8463511703277	29.7668	30.7812
7	2/3	7402775	15.8174	15.6730
	5/3	33934039437	24.2477	24.7812
	8/3	16953652012291	30.4615	31.3460
8	1/3	278511	12.5372	11.8477
	4/3	13996384631	23.3621	23.6954
	7/3	19400406113385	30.5963	31.3460

Table 1: Degeneracies, microscopic entropies and semiclassical entropies for the first few values of m and L_0.

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