On the Ramanujan's equations: new mathematical connections with various parameters of Particle Physics and Cosmology

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Abstract

In this research thesis, we have analyzed further Ramanujan formulas and described new possible mathematical connections with some parameters of Particle Physics and Cosmology

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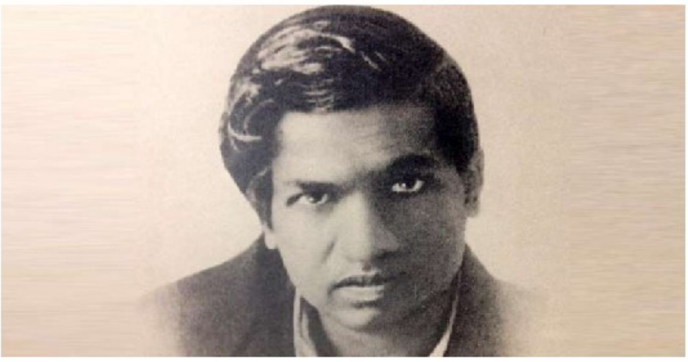

1729

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

https://www.msn.com/en-in/entertainment/themanwhoknewinfinity/10-facts-you-probably-didnt-know-about-srinivasa-ramanujan/ar-BBshdqj - https://school.eckovation.com/1729-magic-number-known-ramanujan-number/

Summary

In this research thesis, we have analyzed further Ramanujan formulas and described new mathematical connections with some sectors of Particle Physics and Cosmology. We have described, as in previous papers, the possible and new connections between different formulas of Ramanujan's mathematics and some formulas concerning particle physics and cosmology. In the course of the discussion we describe and highlight the connections between some

developments of Ramanujan equations and particles type solutions such as the mass of the Higgs boson, those in the range of the mass of candidates" glueball ", the scalar meson $f_0(1710)$ and the masses of other baryons and mesons. Moreover solutions of Ramanujan equations, connected with the masses of the π mesons (139.576 and 134.9766 MeV) have been described and highlighted. Furthermore, we have obtained also the values of some black hole entropies and the value of the Cosmological Constant

Is our opinion, that the possible connections between the mathematical developments of some Rogers-Ramanujan continued fractions, the value of the dilaton and that of "the dilaton mass calculated as a type of Higgs boson that is equal about to 125 GeV", the Higgs boson mass itself and the like-particle solutions (masses), are fundamental.

All the results of the most important connections are highlighted in blue throughout the drafting of the paper

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22. i. $\frac{\pi^2 xy}{2} \cdot \frac{\cosh \pi(x+y)\sqrt{2} \cos \pi(x-y)\sqrt{2} - \cosh \pi(x-y)\sqrt{2} \cos \pi(x+y)\sqrt{2}}{(\cosh \pi x\sqrt{2} - \cos \pi x\sqrt{2})(\cosh \pi y\sqrt{2} - \cos \pi y\sqrt{2})}$

$$= 1 + 2\pi x^3 y \left\{ \frac{\coth \frac{\pi y}{x}}{1^4+x^4} + \frac{2\coth \frac{2\pi y}{x}}{2^4+x^4} + \frac{3\coth \frac{3\pi y}{x}}{3^4+x^4} + \&c \right\}$$

$$+ 2\pi x y^3 \left\{ \frac{\coth \frac{\pi x}{y}}{1^4+y^4} + \frac{2\coth \frac{2\pi x}{y}}{2^4+y^4} + \frac{3\coth \frac{3\pi x}{y}}{3^4+y^4} + \&c \right\}$$

ii. $\int_0^\infty \frac{\cos 2nx}{\cosh \pi\sqrt{x} + \cos \pi\sqrt{x}}\,dx = \frac{e^{-n}}{\cosh \frac{\pi}{2}} - \frac{3e^{-9n}}{\cosh \frac{3\pi}{2}} + \frac{5e^{-25n}}{\cosh \frac{5\pi}{2}} - \&c$

For x = 2, y = 3 and n = 5

$\frac{e^{-n}}{\cosh \frac{\pi}{2}} - \frac{3e^{-9n}}{\cosh \frac{3\pi}{2}} + \frac{5e^{-25n}}{\cosh \frac{5\pi}{2}} - \&c$

n = 5

((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))

Input:

$$\frac{1}{e^5 \cosh\left(\frac{\pi}{2}\right)} - \frac{3 e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5 e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}$$

cosh(x) is the hyperbolic cosine function

Exact result:

$$\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5} - \frac{6\operatorname{sech}(3\pi)}{e^{45}} + \frac{10\operatorname{sech}(5\pi)}{e^{125}}$$

sech(x) is the hyperbolic secant function

Decimal approximation:

0.002685319938934361487411127436572073777859991728225228673...

0.0026853199…

Alternate forms:

$$\frac{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6\,e^{80}\operatorname{sech}(3\,\pi)+10\operatorname{sech}(5\,\pi)}{e^{125}}$$

$$\frac{e^{40}\operatorname{sech}\left(\frac{\pi}{2}\right)-6\operatorname{sech}(3\,\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\,\pi)}{e^{125}}$$

$$\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^{5}\,(1+\cosh(\pi))}-\frac{12\cosh(3\,\pi)}{e^{45}\,(1+\cosh(6\,\pi))}+\frac{20\cosh(5\,\pi)}{e^{125}\,(1+\cosh(10\,\pi))}$$

Alternative representations:

$$\frac{1}{e^{5}\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}=\frac{1}{e^{5}\cos\left(\frac{i\,\pi}{2}\right)}-\frac{3}{\frac{1}{2}\,e^{45}\cos(3\,i\,\pi)}+\frac{5}{\frac{1}{2}\,e^{125}\cos(5\,i\,\pi)}$$

$$\frac{1}{e^{5}\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}=\frac{1}{e^{5}\cos\left(-\frac{i\,\pi}{2}\right)}-\frac{3}{\frac{1}{2}\,e^{45}\cos(-3\,i\,\pi)}+\frac{5}{\frac{1}{2}\,e^{125}\cos(-5\,i\,\pi)}$$

$$\frac{1}{e^{5}\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}=\frac{1}{\frac{e^{5}}{\sec\left(\frac{i\,\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3\,i\,\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5\,i\,\pi)}}$$

Series representations:

$$\frac{1}{e^{5}\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}=\sum_{k=0}^{\infty}2\,(-1)^{k}\,e^{-5\,(25+\pi+2\,k\,\pi)}\left(10-6\,e^{80+2\,\pi+4\,k\,\pi}+e^{120+(9\,\pi)/2+9\,k\,\pi}\right)$$

$$\frac{1}{e^{5}\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}=\sum_{k=0}^{\infty}\left(\frac{(-1)^{k}\,(1+2\,k)\,\pi}{e^{5}\left(\frac{\pi^{2}}{4}+\left(\frac{1}{2}+k\right)^{2}\pi^{2}\right)}-\frac{6\,(-1)^{k}\,(1+2\,k)\,\pi}{e^{45}\left(9\,\pi^{2}+\left(\frac{1}{2}+k\right)^{2}\pi^{2}\right)}+\frac{10\,(-1)^{k}\,(1+2\,k)\,\pi}{e^{125}\left(25\,\pi^{2}+\left(\frac{1}{2}+k\right)^{2}\pi^{2}\right)}\right)$$

$$\frac{1}{e^{5}\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}=\sum_{k=0}^{\infty}\frac{i\left(\operatorname{Li}_{-k}(-i\,e^{z_0})-\operatorname{Li}_{-k}(i\,e^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^{k}-6\,e^{80}\,(3\,\pi-z_0)^{k}+10\,(5\,\pi-z_0)^{k}\right)}{e^{125}\,k!}\quad\text{for }\frac{1}{2}+\frac{i\,z_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$\frac{1}{e^5 \cosh\left(\frac{\pi}{2}\right)} - \frac{3 e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5 e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)} = \int_0^\infty \frac{2\left(e^{120} - 6 e^{80} t^{5i} + 10 t^{9i}\right) t^i}{e^{125}\pi\left(1+t^2\right)}\,dt$$

4Pi*((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18-3+1/golden ratio))))

Input:

$$4\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}} + 18 - 3 + \frac{1}{\phi}\right)$$

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

ϕ is the golden ratio

Exact result:

$$4\pi\left(\frac{1}{\phi} + 15 + \frac{1}{3\left(\frac{\text{sech}\left(\frac{\pi}{2}\right)}{e^5} - \frac{6\,\text{sech}(3\pi)}{e^{45}} + \frac{10\,\text{sech}(5\pi)}{e^{125}}\right)}\right)$$

$\text{sech}(x)$ is the hyperbolic secant function

Decimal approximation:

1756.146970540594121164210566402490547854201958667646661626...

1756.1469705… result in the range of the mass of candidate "glueball" $f_0(1710)$ ("glueball" =1760 ± 15 MeV).

Alternate forms:

$$4\pi\left(\frac{1}{\phi} + 15 + \frac{e^{125}}{3e^{120}\,\text{sech}\left(\frac{\pi}{2}\right) - 18 e^{80}\,\text{sech}(3\pi) + 30\,\text{sech}(5\pi)}\right)$$

$$4\pi\left(\frac{1}{2}\left(29+\sqrt{5}\right) + \frac{1}{3\left(\frac{\text{sech}\left(\frac{\pi}{2}\right)}{e^5} - \frac{6\,\text{sech}(3\pi)}{e^{45}} + \frac{10\,\text{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$4\pi\left(15+\frac{2}{1+\sqrt{5}}+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

Alternative representations:

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$4\pi\left(15+\frac{1}{\phi}+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$4\pi\left(15+\frac{1}{\phi}+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$4\pi\left(15+\frac{1}{\phi}+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\times\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}(-ie^{z_0})-\mathrm{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}\,k!}}$$
$$\text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)=$$
$$60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

4Pi*((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18-3+1/golden ratio))))-29+2

Input:

$$4\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18-3+\frac{1}{\phi}\right)-29+2$$

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

ϕ is the golden ratio

Exact result:

$$4\pi\left(\frac{1}{\phi}+15+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)-27$$

$\operatorname{sech}(x)$ is the hyperbolic secant function

Decimal approximation:

1729.146970540594121164210566402490547854201958667646661626...

1729.1469705…

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

Alternate forms:

$$4\pi\left(\frac{1}{\phi}+15+\frac{e^{125}}{3e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-18e^{80}\operatorname{sech}(3\pi)+30\operatorname{sech}(5\pi)}\right)-27$$

$$4\pi\left(\frac{1}{2}\left(29+\sqrt{5}\right)+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)-27$$

$$4\pi\left(15+\frac{2}{1+\sqrt{5}}+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)-27$$

Expanded form:

$$\frac{4\pi}{\phi} - 27 + 60\pi + \frac{4\pi}{3\left(\frac{\text{sech}\left(\frac{\pi}{2}\right)}{e^5} - \frac{6\,\text{sech}(3\pi)}{e^{45}} + \frac{10\,\text{sech}(5\pi)}{e^{125}}\right)}$$

Alternative representations:

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18 - 3 + \frac{1}{\phi}\right) - 29 + 2 =$$
$$-27 + 4\pi\left(15 + \frac{1}{\phi} + \frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)} - \frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)} + \frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18 - 3 + \frac{1}{\phi}\right) - 29 + 2 =$$
$$-27 + 4\pi\left(15 + \frac{1}{\phi} + \frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)} - \frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)} + \frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18 - 3 + \frac{1}{\phi}\right) - 29 + 2 =$$
$$-27 + 4\pi\left(15 + \frac{1}{\phi} + \frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}} - \frac{3}{\frac{e^{45}}{2\sec(3i\pi)}} + \frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)-29+2=$$
$$-27+60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\times\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)-29+2=-27+60\pi+$$
$$\frac{4\pi}{\phi}+\frac{4\pi}{3\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)-29+2=$$
$$-27+60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\sum_{k=0}^{\infty}\frac{i\left(\text{Li}_{-k}(-ie^{z_0})-\text{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}}$$
$$\text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$4\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18-3+\frac{1}{\phi}\right)-29+2=$$
$$-27+60\pi+\frac{4\pi}{\phi}+\frac{4\pi}{3\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

3Pi*((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))-29+golden ratio^3

Input:

$$3\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)-29+\phi^3$$

cosh(x) is the hyperbolic cosine function

ϕ is the golden ratio

Exact result:

$$\phi^3-29+3\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

sech(x) is the hyperbolic secant function

Decimal approximation:

1314.795796649077119983690292030226625210962602273184329434...

1314.79579… result practically equal to the rest mass of Xi baryon 1314.86

Alternate forms:

$$-27+\sqrt{5}+\pi\left(54+\frac{e^{125}}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}\right)$$

$$-27+\sqrt{5}+3\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$-29+\frac{1}{8}\left(1+\sqrt{5}\right)^3+3\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

Expanded form:

$$\phi^3-29+54\pi+\frac{\pi}{\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}}$$

Alternative representations:

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3=$$

$$-29+\phi^3+3\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3=$$

$$-29+\phi^3+3\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3=$$

$$-29+\phi^3+3\pi\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3=$$

$$-29+\phi^3+54\pi+\frac{\pi}{\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3 = -29+\phi^3+54\pi+\frac{\pi}{\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3 = -29+\phi^3+54\pi+\frac{\pi}{\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}(-ie^{z_0})-\mathrm{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}} \quad \text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$3\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-29+\phi^3 = -29+\phi^3+54\pi+\frac{\pi}{\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

3^2*((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))-47

Input:

$$3^2\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)-47$$

cosh(x) is the hyperbolic cosine function

Exact result:

$$9\left(18+\frac{1}{3\left(\frac{\mathrm{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\,\mathrm{sech}(3\pi)}{e^{45}}+\frac{10\,\mathrm{sech}(5\pi)}{e^{125}}\right)}\right)-47$$

sech(x) is the hyperbolic secant function

Decimal approximation:

1232.185314309517880624282975237331981171361862131170116380...

1232.185314… result practically equal to the rest mass of Delta baryon 1232

Alternate forms:

$$115+\frac{3e^{125}}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}$$

$$115+\frac{3}{\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5(1+\cosh(\pi))}-\frac{12\cosh(3\pi)}{e^{45}(1+\cosh(6\pi))}+\frac{20\cosh(5\pi)}{e^{125}(1+\cosh(10\pi))}}$$

$$\frac{3e^{125}+115e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-690e^{80}\operatorname{sech}(3\pi)+1150\operatorname{sech}(5\pi)}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}$$

Expanded form:

$$115+\frac{3}{\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}}$$

Alternative representations:

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=$$
$$-47+9\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=$$
$$-47+9\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=$$

$$-47+9\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=$$

$$115+\frac{3}{\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=$$

$$115+\frac{3}{\sum_{k=0}^{\infty}\frac{2(-1)^k(1+2k)\left(\frac{e^{120}}{1+2k+2k^2}-\frac{12e^{80}}{37+4k+4k^2}+\frac{20}{101+4k+4k^2}\right)}{e^{125}\pi}}$$

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=115+$$

$$\frac{3}{\sum_{k=0}^{\infty}\frac{i\left(\operatorname{Li}_{-k}\left(-ie^{z_0}\right)-\operatorname{Li}_{-k}\left(ie^{z_0}\right)\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}}\quad\text{for }\frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$3^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-47=$$

$$115+\frac{3e^{125}\pi}{\int_0^\infty \frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{1+t^2}\,dt}$$

4^2((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2))))))))+18))))+11+golden ratio

Input:

$$4^2\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)+11+\phi$$

cosh(x) is the hyperbolic cosine function

ϕ is the golden ratio

Exact result:

$$\phi+11+16\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

sech(x) is the hyperbolic secant function

Decimal approximation:

2286.725259427892793735818765034066937977919175190774858650...

2286.72525942… result practically equal to the rest mass of charmed Lambda baryon 2286.46

Alternate forms:

$$\phi+11+\frac{16}{3}\left(54+\frac{e^{125}}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}\right)$$

$$11+\frac{1}{2}\left(1+\sqrt{5}\right)+16\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$\phi+299+\frac{16}{3\left(\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5(1+\cosh(\pi))}-\frac{12\cosh(3\pi)}{e^{45}(1+\cosh(6\pi))}+\frac{20\cosh(5\pi)}{e^{125}(1+\cosh(10\pi))}\right)}$$

Expanded form:

$$\phi + 299 + \frac{16}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5} - \frac{6\operatorname{sech}(3\pi)}{e^{45}} + \frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}$$

Alternative representations:

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) + 11 + \phi = 11 + \phi + 4^2\left(18 + \frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)} - \frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)} + \frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) + 11 + \phi = 11 + \phi + 4^2\left(18 + \frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)} - \frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)} + \frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) + 11 + \phi = 11 + \phi + 4^2\left(18 + \frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}} - \frac{3}{\frac{e^{45}}{2\sec(3i\pi)}} + \frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+\phi=$$
$$299+\phi+\frac{16}{3\times\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+\phi=$$
$$299+\phi+\frac{16}{3\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+\phi=$$
$$299+\phi+\frac{16}{3\sum_{k=0}^{\infty}\frac{i\left(\text{Li}_{-k}(-ie^{z_0})-\text{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}}$$
$$\text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$4^2\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+\phi=$$
$$299+\phi+\frac{16}{3\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

12Pi((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))+11+47-2*golden ratio

Input:

$$12\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)+11+47-2\phi$$

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

ϕ is the golden ratio

Exact result:

$$-2\phi+58+12\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$\operatorname{sech}(x)$ is the hyperbolic secant function

Decimal approximation:

5413.002846708809531452715299777250119666647317294679689117...

5413.002846… result very near to the rest mass of strange B meson 5415.4

Alternate forms:

$$-2\phi+58+4\pi\left(54+\frac{e^{125}}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}\right)$$

$$57-\sqrt{5}+12\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$-2\phi+58+216\pi+\frac{4\pi}{\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5(1+\cosh(\pi))}-\frac{12\cosh(3\pi)}{e^{45}(1+\cosh(6\pi))}+\frac{20\cosh(5\pi)}{e^{125}(1+\cosh(10\pi))}}$$

Expanded form:

$$-2\phi+58+216\pi+\frac{4\pi}{\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}}$$

Alternative representations:

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=$$

$$58-2\phi+12\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=$$
$$58-2\phi+12\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=$$
$$58-2\phi+12\pi\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=$$
$$58-2\phi+216\pi+\frac{4\pi}{\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=$$
$$58-2\phi+216\pi+\frac{4\pi}{\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=58-2\phi+216\pi+$$
$$\frac{4\pi}{\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}\left(-i e^{z_0}\right)-\mathrm{Li}_{-k}\left(i e^{z_0}\right)\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}} \quad \text{for } \frac{1}{2}+\frac{i z_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$12\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+47-2\phi=$$
$$58-2\phi+216\pi+\frac{4\pi}{\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi\left(1+t^2\right)}\,dt}$$

21Pi((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))+11+76-2*golden ratio

Input:

$$21\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)+11+76-2\phi$$

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

ϕ is the golden ratio

Exact result:

$$-2\phi+87+21\pi\left(18+\frac{1}{3\left(\frac{\mathrm{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\,\mathrm{sech}(3\pi)}{e^{45}}+\frac{10\,\mathrm{sech}(5\pi)}{e^{125}}\right)}\right)$$

$\mathrm{sech}(x)$ is the hyperbolic secant function

Decimal approximation:

9460.682032723541522314558654861736166593213269035398100248...

9460.6820327… result practically equal to the rest mass of Upsilon meson 9460.30

Alternate forms:

$$-2\phi+87+7\pi\left(54+\frac{e^{125}}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}\right)$$

$$86-\sqrt{5}+21\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$-2\phi+87+378\pi+\frac{7\pi}{\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5(1+\cosh(\pi))}-\frac{12\cosh(3\pi)}{e^{45}(1+\cosh(6\pi))}+\frac{20\cosh(5\pi)}{e^{125}(1+\cosh(10\pi))}}$$

Expanded form:

$$-2\phi+87+378\pi+\frac{7\pi}{\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}}$$

Alternative representations:

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi=$$

$$87-2\phi+21\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi=$$

$$87-2\phi+21\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi =$$

$$87-2\phi+21\pi\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi =$$

$$87-2\phi+378\pi+\frac{7\pi}{\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi =$$

$$87-2\phi+378\pi+\frac{7\pi}{\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi = 87-2\phi+378\pi+$$

$$\frac{7\pi}{\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}\left(-ie^{z_0}\right)-\mathrm{Li}_{-k}\left(ie^{z_0}\right)\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}}\quad \text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$21\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+11+76-2\phi=$$

$$87-2\phi+378\pi+\frac{7\pi}{\int_0^\infty \frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi\left(1+t^2\right)}\,dt}$$

13Pi((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))+322+123+29-golden ratio^2

Input:

$$13\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)+322+123+29-\phi^2$$

cosh(x) is the hyperbolic cosine function

ϕ is the golden ratio

Exact result:

$$-\phi^2+474+13\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

sech(x) is the hyperbolic secant function

Decimal approximation:

6276.140790254751869730013592732114207442874954445676386549...

6276.14079025… result very near to the rest mass of charmed B meson 6275.6

Alternate forms:

$$-\phi^2+474+13\pi\left(18+\frac{e^{125}}{3e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-18e^{80}\operatorname{sech}(3\pi)+30\operatorname{sech}(5\pi)}\right)$$

$$\frac{1}{2}\left(945-\sqrt{5}\right)+13\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$474-\frac{1}{4}\left(1+\sqrt{5}\right)^2+13\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

Expanded form:

$$-\phi^2+474+234\pi+\frac{13\pi}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}$$

Alternative representations:

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=$$

$$474-\phi^2+13\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=$$

$$474-\phi^2+13\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=$$

$$474-\phi^2+13\pi\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=$$

$$474-\phi^2+234\pi+\frac{13\pi}{3\times\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=474-\phi^2+$$

$$234\pi+\frac{13\pi}{3\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=$$

$$474-\phi^2+234\pi+\frac{13\pi}{3\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}(-ie^{z_0})-\mathrm{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}}$$

$$\text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$13\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+322+123+29-\phi^2=$$

$$474-\phi^2+234\pi+\frac{13\pi}{3\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

2Pi((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))-123+Pi*golden ratio

Input:

$$2\pi\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)-123+\pi\phi$$

cosh(x) is the hyperbolic cosine function

ϕ is the golden ratio

Exact result:

$$\pi\phi-123+2\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

sech(x) is the hyperbolic secant function

Decimal approximation:

775.1230228067001466739969212542390981588464952356030232607...

775.123022806… result practically equal to the rest mass of Charmed rho meson 775.11

Alternate forms:

$$\pi\phi-123+2\pi\left(18+\frac{e^{125}}{3e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-18e^{80}\operatorname{sech}(3\pi)+30\operatorname{sech}(5\pi)}\right)$$

$$-123+\frac{1}{2}\left(1+\sqrt{5}\right)\pi+2\pi\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

$$\pi\phi-123+36\pi+\frac{2\pi}{3\left(\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5(1+\cosh(\pi))}-\frac{12\cosh(3\pi)}{e^{45}(1+\cosh(6\pi))}+\frac{20\cosh(5\pi)}{e^{125}(1+\cosh(10\pi))}\right)}$$

Expanded form:

$$\pi\phi-123+36\pi+\frac{2\pi}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}$$

Alternative representations:

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=$$

$$-123+\phi\pi+2\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=$$

$$-123+\phi\pi+2\pi\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(-3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(-5i\pi)}\right)}\right)$$

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=$$

$$-123+\phi\pi+2\pi\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3i\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5i\pi)}}\right)}\right)$$

Series representations:

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times 5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times 5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=$$

$$-123+36\pi+\phi\pi+\frac{2\pi}{3\times\sum_{k=0}^{\infty}2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10-6e^{80+2\pi+4k\pi}+e^{120+(9\pi)/2+9k\pi}\right)}$$

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=-123+36\pi+$$

$$\phi\pi+\frac{2\pi}{3\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=$$

$$-123+36\pi+\phi\pi+\frac{2\pi}{3\sum_{k=0}^{\infty}\frac{i\left(\text{Li}_{-k}(-ie^{z_0})-\text{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}k!}}$$

$$\text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$2\pi\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)-123+\pi\phi=$$

$$-123+36\pi+\phi\pi+\frac{2\pi}{3\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2))))))))+18))))-Pi+1/golden ratio

Input:

$$\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)-\pi+\frac{1}{\phi}$$

cosh(x) is the hyperbolic cosine function

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi}+18-\pi+\frac{1}{3\left(\frac{\text{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\,\text{sech}(3\pi)}{e^{45}}+\frac{10\,\text{sech}(5\pi)}{e^{125}}\right)}$$

sech(x) is the hyperbolic secant function

Decimal approximation:

139.60814292510653279021782958856746647478556890611622552799...

139.6081429… result practically equal to the rest mass of Pion meson 139.57

Alternate forms:

$$\frac{1}{\phi}+18-\pi+\frac{e^{125}}{3\,e^{120}\,\text{sech}\left(\frac{\pi}{2}\right)-18\,e^{80}\,\text{sech}(3\,\pi)+30\,\text{sech}(5\,\pi)}$$

$$18+\frac{2}{1+\sqrt{5}}-\pi+\frac{1}{3\left(\frac{\text{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\,\text{sech}(3\,\pi)}{e^{45}}+\frac{10\,\text{sech}(5\,\pi)}{e^{125}}\right)}$$

$$\frac{1}{\phi}+18-\pi+\frac{1}{3\left(\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5\,(1+\cosh(\pi))}-\frac{12\cosh(3\,\pi)}{e^{45}\,(1+\cosh(6\,\pi))}+\frac{20\cosh(5\,\pi)}{e^{125}\,(1+\cosh(10\,\pi))}\right)}$$

Alternative representations:

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)-\pi+\frac{1}{\phi}=$$
$$18-\pi+\frac{1}{\phi}+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\,\pi}{2}\right)}-\frac{3}{\frac{1}{2}\,e^{45}\cos(3\,i\,\pi)}+\frac{5}{\frac{1}{2}\,e^{125}\cos(5\,i\,\pi)}\right)}$$

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)-\pi+\frac{1}{\phi}=$$
$$18-\pi+\frac{1}{\phi}+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\,\pi}{2}\right)}-\frac{3}{\frac{1}{2}\,e^{45}\cos(-3\,i\,\pi)}+\frac{5}{\frac{1}{2}\,e^{125}\cos(-5\,i\,\pi)}\right)}$$

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)-\pi+\frac{1}{\phi}=$$
$$18-\pi+\frac{1}{\phi}+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\,\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3\,i\,\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5\,i\,\pi)}}\right)}$$

Series representations:

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) - \pi + \frac{1}{\phi} =$$
$$18 + \frac{1}{\phi} - \pi + \frac{1}{3\times\sum_{k=0}^{\infty} 2(-1)^k e^{-5(25+\pi+2k\pi)}\left(10 - 6e^{80+2\pi+4k\pi} + e^{120+(9\pi)/2+9k\pi}\right)}$$

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) - \pi + \frac{1}{\phi} =$$
$$18 + \frac{1}{\phi} - \pi + \frac{1}{3\sum_{k=0}^{\infty}\left(\frac{(-1)^k(1+2k)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)} - \frac{6(-1)^k(1+2k)\pi}{e^{45}\left(9\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)} + \frac{10(-1)^k(1+2k)\pi}{e^{125}\left(25\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) - \pi + \frac{1}{\phi} =$$
$$18 + \frac{1}{\phi} - \pi + \frac{1}{3\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}\left(-i e^{z_0}\right) - \mathrm{Li}_{-k}\left(i e^{z_0}\right)\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k - 6e^{80}(3\pi-z_0)^k + 10(5\pi-z_0)^k\right)}{e^{125}\,k!}}$$
$$\text{for } \frac{1}{2} + \frac{i z_0}{\pi} \notin \mathbb{Z}$$

Integral representation:

$$\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)} - \frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)} + \frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3} + 18\right) - \pi + \frac{1}{\phi} =$$
$$18 + \frac{1}{\phi} - \pi + \frac{1}{3\int_0^{\infty}\frac{2\left(e^{120} - 6e^{80}t^{5i} + 10t^{9i}\right)t^i}{e^{125}\pi\left(1+t^2\right)}\,dt}$$

21*((((1/3*1/((((((e^(-5))) / ((cosh(Pi/2))) – ((3*e^(-9*5))) / ((cosh(3Pi)/(2))) + ((5e^(-25*5))) / ((cosh(5Pi)/(2)))))))+18))))+123-11

Input:

$$21\left(\frac{1}{3}\times\frac{1}{\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}}+18\right)+123-11$$

cosh(x) is the hyperbolic cosine function

Exact result:

$$112+21\left(18+\frac{1}{3\left(\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}\right)}\right)$$

sech(x) is the hyperbolic secant function

Decimal approximation:

3096.765733388875054789993608887107956066511011639396938221...

3096.76573… result practically equal to the rest mass of J/Psi meson 3096.916

Alternate forms:

$$490+\frac{7e^{125}}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}$$

$$490+\frac{7}{\frac{2\cosh\left(\frac{\pi}{2}\right)}{e^5(1+\cosh(\pi))}-\frac{12\cosh(3\pi)}{e^{45}(1+\cosh(6\pi))}+\frac{20\cosh(5\pi)}{e^{125}(1+\cosh(10\pi))}}$$

$$\frac{7\left(e^{125}+70e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-420e^{80}\operatorname{sech}(3\pi)+700\operatorname{sech}(5\pi)\right)}{e^{120}\operatorname{sech}\left(\frac{\pi}{2}\right)-6e^{80}\operatorname{sech}(3\pi)+10\operatorname{sech}(5\pi)}$$

Expanded form:

$$490+\frac{7}{\frac{\operatorname{sech}\left(\frac{\pi}{2}\right)}{e^5}-\frac{6\operatorname{sech}(3\pi)}{e^{45}}+\frac{10\operatorname{sech}(5\pi)}{e^{125}}}$$

Alternative representations:

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3e^{-9\times5}}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25\times5}}{\frac{1}{2}\cosh(5\pi)}\right)3}+18\right)+123-11=$$

$$112+21\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}e^{45}\cos(3i\pi)}+\frac{5}{\frac{1}{2}e^{125}\cos(5i\pi)}\right)}\right)$$

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)+123-11=$$

$$112+21\left(18+\frac{1}{3\left(\frac{1}{e^5\cos\left(-\frac{i\pi}{2}\right)}-\frac{3}{\frac{1}{2}\,e^{45}\cos(-3\,i\,\pi)}+\frac{5}{\frac{1}{2}\,e^{125}\cos(-5\,i\,\pi)}\right)}\right)$$

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)+123-11=$$

$$112+21\left(18+\frac{1}{3\left(\frac{1}{\frac{e^5}{\sec\left(\frac{i\,\pi}{2}\right)}}-\frac{3}{\frac{e^{45}}{2\sec(3\,i\,\pi)}}+\frac{5}{\frac{e^{125}}{2\sec(5\,i\,\pi)}}\right)}\right)$$

Series representations:

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)+123-11=$$

$$490+\frac{7}{\sum_{k=0}^{\infty}2\,(-1)^k\,e^{-5\left(25+\pi+2\,k\,\pi\right)}\left(10-6\,e^{80+2\,\pi+4\,k\,\pi}+e^{120+(9\,\pi)/2+9\,k\,\pi}\right)}$$

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh\left(\frac{\pi}{2}\right)}-\frac{3\,e^{-9\times 5}}{\frac{1}{2}\cosh(3\,\pi)}+\frac{5\,e^{-25\times 5}}{\frac{1}{2}\cosh(5\,\pi)}\right)3}+18\right)+123-11=$$

$$490+\frac{7}{\sum_{k=0}^{\infty}\left(\frac{(-1)^k\left(1+2\,k\right)\pi}{e^5\left(\frac{\pi^2}{4}+\left(\frac{1}{2}+k\right)^2\pi^2\right)}-\frac{6\,(-1)^k\left(1+2\,k\right)\pi}{e^{45}\left(9\,\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}+\frac{10\,(-1)^k\left(1+2\,k\right)\pi}{e^{125}\left(25\,\pi^2+\left(\frac{1}{2}+k\right)^2\pi^2\right)}\right)}$$

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh(\frac{\pi}{2})}-\frac{3e^{-9}\times 5}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25}\times 5}{\frac{1}{2}\cosh(5\pi)}\right)^3}+18\right)+123-11=490+\frac{7}{\sum_{k=0}^{\infty}\frac{i\left(\mathrm{Li}_{-k}(-ie^{z_0})-\mathrm{Li}_{-k}(ie^{z_0})\right)\left(e^{120}\left(\frac{\pi}{2}-z_0\right)^k-6e^{80}(3\pi-z_0)^k+10(5\pi-z_0)^k\right)}{e^{125}\,k!}}\quad \text{for } \frac{1}{2}+\frac{iz_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$21\left(\frac{1}{\left(\frac{1}{e^5\cosh(\frac{\pi}{2})}-\frac{3e^{-9}\times 5}{\frac{1}{2}\cosh(3\pi)}+\frac{5e^{-25}\times 5}{\frac{1}{2}\cosh(5\pi)}\right)^3}+18\right)+123-11=$$
$$490+\frac{7}{\int_0^{\infty}\frac{2\left(e^{120}-6e^{80}t^{5i}+10t^{9i}\right)t^i}{e^{125}\pi(1+t^2)}\,dt}$$

Now, we have that:

$$=1+2\pi x^3y\left\{\frac{\coth\frac{\pi y}{x}}{1^4+x^4}+\frac{2\coth\frac{2\pi y}{x}}{2^4+x^4}+\frac{3\coth\frac{3\pi y}{x}}{3^4+x^4}+\&c\right\}$$
$$+2\pi xy^3\left\{\frac{\coth\frac{\pi x}{y}}{1^4+y^4}+\frac{2\coth\frac{2\pi x}{y}}{2^4+y^4}+\frac{3\coth\frac{3\pi x}{y}}{3^4+y^4}+\&c\right\}$$

For x = 2, y = 3 and n = 5

1+2Pi*2^3*3((((coth (3Pi/2)))/(1^4+2^4)+(2coth (6Pi/2))/(2^4+2^4)+(3coth (9Pi/2))/(3^4+2^4)))

Input:

$$1+2\pi\times 2^3\times 3\left(\frac{\coth\left(3\times\frac{\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(6\times\frac{\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(9\times\frac{\pi}{2}\right)}{3^4+2^4}\right)$$

coth(x) is the hyperbolic cotangent function

Exact result:

$$1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)$$

Decimal approximation:

23.96039677761296996027353812682649856796730977164438556572...

23.960396777612969… result practically equal to the black hole entropy 23.9078

Alternate forms:

$$1+\frac{48}{17}\pi\coth\left(\frac{3\pi}{2}\right)+3\pi\coth(3\pi)+\frac{144}{97}\pi\coth\left(\frac{9\pi}{2}\right)$$

$$\frac{1649+4656\pi\coth\left(\frac{3\pi}{2}\right)+4947\pi\coth(3\pi)+2448\pi\coth\left(\frac{9\pi}{2}\right)}{1649}$$

$$1+\pi\left(\frac{48}{17}\coth\left(\frac{3\pi}{2}\right)+3\coth(3\pi)+\frac{144}{97}\coth\left(\frac{9\pi}{2}\right)\right)$$

Alternative representations:

$$1+2\pi 2^3\times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right)=$$
$$1+48\pi\left(\frac{1+\frac{2}{-1+e^{3\pi}}}{1^4+2^4}+\frac{2\left(1+\frac{2}{-1+e^{6\pi}}\right)}{2\times 2^4}+\frac{3\left(1+\frac{2}{-1+e^{9\pi}}\right)}{2^4+3^4}\right)$$

$$1+2\pi 2^3\times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right)=$$
$$1+48\pi\left(\frac{2i\cot(3i\pi)}{2\times 2^4}+\frac{i\cot\left(\frac{3i\pi}{2}\right)}{1^4+2^4}+\frac{3i\cot\left(\frac{9i\pi}{2}\right)}{2^4+3^4}\right)$$

$$1+2\pi 2^3\times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right)=$$
$$1+48\pi\left(-\frac{2i\cot(-3i\pi)}{2\times 2^4}-\frac{i\cot\left(-\frac{3i\pi}{2}\right)}{1^4+2^4}-\frac{3i\cot\left(-\frac{9i\pi}{2}\right)}{2^4+3^4}\right)$$

Series representations:

$$1+2\pi 2^3\times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right)=$$
$$1+\sum_{k=-\infty}^{\infty}\left(\frac{9}{9+k^2}+\frac{2592}{97\left(81+4k^2\right)}+\frac{288}{153+68k^2}\right)$$

$$1+2\pi\, 2^3 \times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right) = \frac{6946}{1649}+\sum_{k=1}^{\infty}\left(\frac{18}{9+k^2}+\frac{576}{17\,(9+4k^2)}+\frac{5184}{97\,(81+4k^2)}\right)$$

$$1+2\pi\, 2^3 \times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right) = 1+\frac{12\,051\,\pi}{1649}+\sum_{k=0}^{\infty}\left(\frac{288}{97}\,e^{-9(1+k)\pi}\,\pi+6\,e^{-6(1+k)\pi}\,\pi+\frac{96}{17}\,e^{-3(1+k)\pi}\,\pi\right)$$

Integral representation:

$$1+2\pi\, 2^3 \times 3\left(\frac{\coth\left(\frac{3\pi}{2}\right)}{1^4+2^4}+\frac{2\coth\left(\frac{6\pi}{2}\right)}{2^4+2^4}+\frac{3\coth\left(\frac{9\pi}{2}\right)}{3^4+2^4}\right) = 1+\int_{\frac{i\pi}{2}}^{\frac{9\pi}{2}}\left(-\frac{144}{97}\,\pi\,\text{csch}^2(t)+\left(\frac{14}{41}-\frac{3i}{41}\right)\left(-\frac{48}{17}\,\pi\,\text{csch}^2\left(\frac{\left(\frac{9}{41}+\frac{i}{41}\right)\left(-\frac{3i\pi^2}{2}-\left(\frac{3}{2}-\frac{i}{2}\right)\pi t\right)}{\pi}\right)-\left(\frac{57}{10}+\frac{9i}{10}\right)\pi\,\text{csch}^2\left(\frac{\left(\frac{3}{5}+\frac{i}{5}\right)\left(\frac{3i\pi^2}{4}+\left(\frac{55}{82}-\frac{3i}{82}\right)\left(-\frac{3i\pi^2}{2}-\left(\frac{3}{2}-\frac{i}{2}\right)\pi t\right)\right)}{\pi}\right)\right)\right)dt$$

2Pi*2*3^3((((coth (2Pi/3)))/(1^4+3^4)+(2coth (4Pi/3))/(2^4+3^4)+(3coth (6Pi/3))/(3^4+3^4)))

Input:

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

Exact result:

$$108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)$$

Decimal approximation:

17.547292176109789307906942183274250468763777370322447510 33...

17.54729217610…. result practically equal to the black hole entropy 17.5764

Alternate forms:

$$\pi\left(\tanh(\pi)+\frac{54}{41}\coth\left(\frac{2\pi}{3}\right)+\coth(\pi)+\frac{216}{97}\coth\left(\frac{4\pi}{3}\right)\right)$$

$$\frac{54}{41}\pi\coth\left(\frac{2\pi}{3}\right)+\frac{216}{97}\pi\coth\left(\frac{4\pi}{3}\right)+2\pi\coth(2\pi)$$

$$\frac{2\pi\left(2619\coth\left(\frac{2\pi}{3}\right)+4428\coth\left(\frac{4\pi}{3}\right)+3977\coth(2\pi)\right)}{3977}$$

Alternative representations:

$$2\pi 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right)=108\pi\left(\frac{3i\cot(2i\pi)}{2\times 3^4}+\frac{i\cot\left(\frac{2i\pi}{3}\right)}{1^4+3^4}+\frac{2i\cot\left(\frac{4i\pi}{3}\right)}{2^4+3^4}\right)$$

$$2\pi 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right)=108\pi\left(\frac{1+\frac{2}{-1+e^{(4\pi)/3}}}{1^4+3^4}+\frac{2\left(1+\frac{2}{-1+e^{(8\pi)/3}}\right)}{2^4+3^4}+\frac{3\left(1+\frac{2}{-1+e^{4\pi}}\right)}{2\times 3^4}\right)$$

$$2\pi 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right)=108\pi\left(-\frac{3i\cot(-2i\pi)}{2\times 3^4}-\frac{i\cot\left(-\frac{2i\pi}{3}\right)}{1^4+3^4}-\frac{2i\cot\left(-\frac{4i\pi}{3}\right)}{2^4+3^4}\right)$$

Series representations:

$$2\pi 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right)=\sum_{k=-\infty}^{\infty}\left(\frac{4}{4+k^2}+\frac{324}{41\left(4+9k^2\right)}+\frac{2592}{97\left(16+9k^2\right)}\right)$$

$$2\pi\, 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right) = \frac{18476}{3977}+\sum_{k=1}^{\infty}\left(\frac{8}{4+k^2}+\frac{648}{41\left(4+9k^2\right)}+\frac{5184}{97\left(16+9k^2\right)}\right)$$

$$2\pi\, 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right) = \frac{22048\pi}{3977}+\sum_{k=0}^{\infty}\left(4e^{-4(1+k)\pi}\pi+\frac{432}{97}e^{-8/3(1+k)\pi}\pi+\frac{108}{41}e^{-4/3(1+k)\pi}\pi\right)$$

Integral representation:

$$2\pi\, 2\times 3^3\left(\frac{\coth\left(\frac{2\pi}{3}\right)}{1^4+3^4}+\frac{2\coth\left(\frac{4\pi}{3}\right)}{2^4+3^4}+\frac{3\coth\left(\frac{6\pi}{3}\right)}{3^4+3^4}\right) = \int_{\frac{i\pi}{2}}^{2\pi}\left(-2\pi\operatorname{csch}^2(t)+\left(\frac{19}{51}-\frac{8i}{51}\right)\left(-\frac{54}{41}\pi\operatorname{csch}^2\left(\frac{\left(\frac{8}{17}+\frac{2i}{17}\right)\left(-\frac{2i\pi^2}{3}-\left(\frac{2}{3}-\frac{i}{2}\right)\pi t\right)}{\pi}\right)-\left(\frac{8856}{2425}+\frac{2592i}{2425}\right)\pi\operatorname{csch}^2\left(\frac{\left(\frac{24}{25}+\frac{18i}{25}\right)\left(\frac{i\pi^2}{3}+\left(\frac{35}{51}-\frac{4i}{51}\right)\left(-\frac{2i\pi^2}{3}-\left(\frac{2}{3}-\frac{i}{2}\right)\pi t\right)\right)}{\pi}\right)\right)\right)dt$$

(((1 + 48 π (1/17 coth((3 π)/2) + 1/16 coth(3 π) + 3/97 coth((9 π)/2))))) + ((((108 π (1/82 coth((2 π)/3) + 2/97 coth((4 π)/3) + 1/54 coth(2 π))))))

Input:

$$\left(1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)\right)+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)$$

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

Exact result:

$$1+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)$$

Decimal approximation:

41.50768895372275926818048031010074903673108714196683307605...

41.507688953722...

5(((1 + 48 π (1/17 coth((3 π)/2) + 1/16 coth(3 π) + 3/97 coth((9 π)/2))))) + ((((108 π (1/82 coth((2 π)/3) + 2/97 coth((4 π)/3) + 1/54 coth(2 π))))))+Pi-1/golden ratio

Input:

$$5\left(1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)\right)+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)+\pi-\frac{1}{\phi}$$

coth(x) is the hyperbolic cotangent function

ϕ is the golden ratio

Decimal approximation:

139.8728347290145374995326893663206080750771864481137182977...

139.872934729... result practically equal to the rest mass of Pion meson 139.57

We have that:

76(((1 + 48 π (1/17 coth((3 π)/2) + 1/16 coth(3 π) + 3/97 coth((9 π)/2))))) + ((((108 π (1/82 coth((2 π)/3) + 2/97 coth((4 π)/3) + 1/54 coth(2 π))))))+29+golden ratio

Input:

$$76\left(1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)\right)+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)+29+\phi$$

coth(x) is the hyperbolic cotangent function

ϕ is the golden ratio

Decimal approximation:

1869.155481263445401136900426656453779751999629195101513367...

1869.15548... result practically equal to the rest mass of D meson 1869.61

47(((1 + 48 π (1/17 coth((3 π)/2) + 1/16 coth(3 π) + 3/97 coth((9 π)/2))))) + ((((108 π (1/82 coth((2 π)/3) + 2/97 coth((4 π)/3) + 1/54 coth(2 π))))))+47+golden ratio

Input:

$$47\left(1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)\right)+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)+47+\phi$$

coth(x) is the hyperbolic cotangent function

ϕ is the golden ratio

Decimal approximation:

1192.303974712669272288967820978485321280947645817414331961...

1192.3039747... result practically equal to the rest mass of Sigma baryon 1192.642

76(((1 + 48 π (1/17 coth((3 π)/2) + 1/16 coth(3 π) + 3/97 coth((9 π)/2))))) + ((((108 π (1/82 coth((2 π)/3) + 2/97 coth((4 π)/3) + 1/54 coth(2 π))))))-123+11+golden ratio

Input:

$$76\left(1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)\right)+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)-123+11+\phi$$

coth(x) is the hyperbolic cotangent function

ϕ is the golden ratio

Exact result:

$$\phi-112+108\pi\left(\frac{1}{82}\coth\left(\frac{2\pi}{3}\right)+\frac{2}{97}\coth\left(\frac{4\pi}{3}\right)+\frac{1}{54}\coth(2\pi)\right)+76\left(1+48\pi\left(\frac{1}{17}\coth\left(\frac{3\pi}{2}\right)+\frac{1}{16}\coth(3\pi)+\frac{3}{97}\coth\left(\frac{9\pi}{2}\right)\right)\right)$$

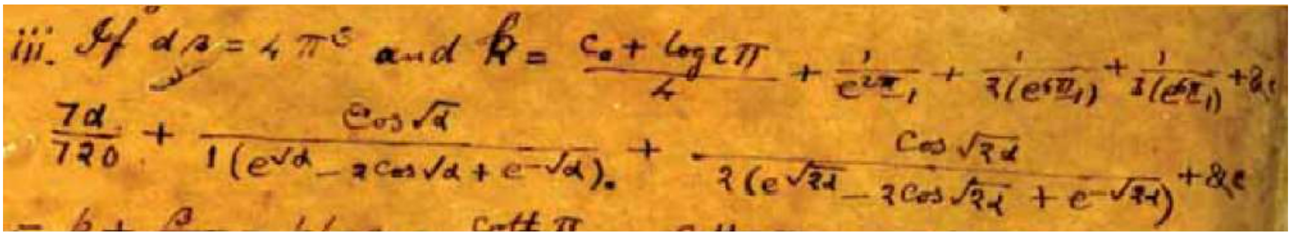
Decimal approximation:

1728.155481263445401136900426656453779751999629195101513367...

1728.155481263...

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

Now, we have that:



iii. If $\alpha\beta = 4\pi^5$ and $k = \frac{C_0 + \log_2 \pi}{4} + \frac{1}{e^{2\pi}-1} + \frac{1}{2(e^{\sqrt{2}\pi}-1)} + \frac{1}{3(e^{\sqrt{3}\pi}-1)} + \&c$

$\frac{7\alpha}{720} + \frac{\cos\sqrt{\alpha}}{1(e^{\sqrt{\alpha}} - 2\cos\sqrt{\alpha} + e^{-\sqrt{\alpha}})} + \frac{\cos\sqrt{2\alpha}}{2(e^{\sqrt{2\alpha}} - 2\cos\sqrt{2\alpha} + e^{-\sqrt{2\alpha}})} + \&c$

For $\alpha = 4\pi^3$, we obtain:

(7*4Pi^3)/720 + ((cos (sqrt(4Pi^3))))/((1(e^(sqrt(4Pi^3))))-2cos (sqrt(4Pi^3))+e^-(sqrt(4Pi^3))) + ((cos (sqrt(2*4Pi^3))))/(((((2(((e^(sqrt(2*4Pi^3))))-2cos (sqrt(2*4Pi^3))+e^-(sqrt(2*4Pi^3))))))))

Input:

$$\frac{1}{720}(7\times 4\pi^3) + \frac{\cos\left(\sqrt{4\pi^3}\right)}{1\, e^{\sqrt{4\pi^3}} - 2\cos\left(\sqrt{4\pi^3}\right) + e^{-\sqrt{4\pi^3}}} + \frac{\cos\left(\sqrt{2\times 4\pi^3}\right)}{2\left(e^{\sqrt{2\times 4\pi^3}} - 2\cos\left(\sqrt{2\times 4\pi^3}\right) + e^{-\sqrt{2\times 4\pi^3}}\right)}$$

Exact result:

$$\frac{7\pi^3}{180} + \frac{\cos(2\pi^{3/2})}{e^{-2\pi^{3/2}} + e^{2\pi^{3/2}} - 2\cos(2\pi^{3/2})} + \frac{\cos(2\sqrt{2}\,\pi^{3/2})}{2\left(e^{-2\sqrt{2}\,\pi^{3/2}} + e^{2\sqrt{2}\,\pi^{3/2}} - 2\cos(2\sqrt{2}\,\pi^{3/2})\right)}$$

Decimal approximation:

1.205801624994993126045384839239801129207915546262193695221...

1.2058016249949…

Alternate forms:

$$\frac{7\pi^3}{180} + \frac{\cos(2\pi^{3/2})}{2\cosh(2\pi^{3/2}) - 2\cos(2\pi^{3/2})} + \frac{\cos(2\sqrt{2}\,\pi^{3/2})}{2(2\cosh(2\sqrt{2}\,\pi^{3/2}) - 2\cos(2\sqrt{2}\,\pi^{3/2}))}$$

$$\frac{7\pi^3 + 7e^{4\pi^{3/2}}\pi^3 + 180e^{2\pi^{3/2}}\cos(2\pi^{3/2}) - 14e^{2\pi^{3/2}}\pi^3\cos(2\pi^{3/2})}{180\left(1 + e^{4\pi^{3/2}} - 2e^{2\pi^{3/2}}\cos(2\pi^{3/2})\right)} + \frac{e^{2\sqrt{2}\,\pi^{3/2}}\cos(2\sqrt{2}\,\pi^{3/2})}{2\left(1 + e^{4\sqrt{2}\,\pi^{3/2}} - 2e^{2\sqrt{2}\,\pi^{3/2}}\cos(2\sqrt{2}\,\pi^{3/2})\right)}$$

$$\frac{e^{-2i\pi^{3/2}} + e^{2i\pi^{3/2}}}{2\left(e^{-2\pi^{3/2}} - e^{-2i\pi^{3/2}} - e^{2i\pi^{3/2}} + e^{2\pi^{3/2}}\right)} + \frac{e^{-2i\sqrt{2}\,\pi^{3/2}} + e^{2i\sqrt{2}\,\pi^{3/2}}}{4\left(e^{-2\sqrt{2}\,\pi^{3/2}} - e^{-2i\sqrt{2}\,\pi^{3/2}} - e^{2i\sqrt{2}\,\pi^{3/2}} + e^{2\sqrt{2}\,\pi^{3/2}}\right)} + \frac{7\pi^3}{180}$$

cosh(x) is the hyperbolic cosine function

Alternative representations:

$$\frac{7}{720}(4\pi^3) + \frac{\cos\left(\sqrt{4\pi^3}\right)}{1e^{\sqrt{4\pi^3}} - 2\cos\left(\sqrt{4\pi^3}\right) + e^{-\sqrt{4\pi^3}}} + \frac{\cos\left(\sqrt{2\times4\pi^3}\right)}{2\left(e^{\sqrt{2\times4\pi^3}} - 2\cos\left(\sqrt{2\times4\pi^3}\right) + e^{-\sqrt{2\times4\pi^3}}\right)} = \frac{28\pi^3}{720} + \frac{\cosh\left(i\sqrt{4\pi^3}\right)}{-2\cosh\left(i\sqrt{4\pi^3}\right) + e^{-\sqrt{4\pi^3}} + e^{\sqrt{4\pi^3}}} + \frac{\cosh\left(i\sqrt{8\pi^3}\right)}{2\left(-2\cosh\left(i\sqrt{8\pi^3}\right) + e^{-\sqrt{8\pi^3}} + e^{\sqrt{8\pi^3}}\right)}$$

$$\frac{7}{720}(4\pi^3) + \frac{\cos\left(\sqrt{4\pi^3}\right)}{1e^{\sqrt{4\pi^3}} - 2\cos\left(\sqrt{4\pi^3}\right) + e^{-\sqrt{4\pi^3}}} + \frac{\cos\left(\sqrt{2\times4\pi^3}\right)}{2\left(e^{\sqrt{2\times4\pi^3}} - 2\cos\left(\sqrt{2\times4\pi^3}\right) + e^{-\sqrt{2\times4\pi^3}}\right)} = \frac{28\pi^3}{720} + \frac{\cosh\left(-i\sqrt{4\pi^3}\right)}{-2\cosh\left(-i\sqrt{4\pi^3}\right) + e^{-\sqrt{4\pi^3}} + e^{\sqrt{4\pi^3}}} + \frac{\cosh\left(-i\sqrt{8\pi^3}\right)}{2\left(-2\cosh\left(-i\sqrt{8\pi^3}\right) + e^{-\sqrt{8\pi^3}} + e^{\sqrt{8\pi^3}}\right)}$$

$$\frac{7}{720}(4\pi^3)+\frac{\cos\left(\sqrt{4\pi^3}\right)}{1\,e^{\sqrt{4\pi^3}}-2\cos\left(\sqrt{4\pi^3}\right)+e^{-\sqrt{4\pi^3}}}+\frac{\cos\left(\sqrt{2\times 4\pi^3}\right)}{2\left(e^{\sqrt{2\times 4\pi^3}}-2\cos\left(\sqrt{2\times 4\pi^3}\right)+e^{-\sqrt{2\times 4\pi^3}}\right)}=$$

$$\frac{28\pi^3}{720}+\frac{1}{\left(e^{-\sqrt{4\pi^3}}+e^{\sqrt{4\pi^3}}-\frac{2}{\sec\left(\sqrt{4\pi^3}\right)}\right)\sec\left(\sqrt{4\pi^3}\right)}+\frac{1}{\left(2\left(e^{-\sqrt{8\pi^3}}+e^{\sqrt{8\pi^3}}-\frac{2}{\sec\left(\sqrt{8\pi^3}\right)}\right)\right)\sec\left(\sqrt{8\pi^3}\right)}$$

And:

(((1/2(1.205801624994993126))))^1/48

Input interpretation:

$$\sqrt[48]{\frac{1}{2}\times 1.205801624994993126}$$

Result:

0.989513648664625591827...

0.989513648..... result practically equal to the dilaton value **0.989117352243 = ϕ**

golden ratio^2 * log base 0.989513648664 (((1/2(1.205801624994993126))))

Input interpretation:

$$\phi^2 \log_{0.989513648664}\left(\frac{1}{2}\times 1.205801624994993126\right)$$

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

ϕ is the golden ratio

Result:

125.6656315...

125.6656315… 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

Alternative representation:

$$\phi^2 \log_{0.9895136486640000}\left(\frac{1.2058016249949931260000}{2}\right) = \frac{\log(0.6029008124974965630000)\,\phi^2}{\log(0.9895136486640000)}$$

Series representations:

$$\phi^2 \log_{0.9895136486640000}\left(\frac{1.2058016249949931260000}{2}\right) = -\frac{\phi^2 \sum_{k=1}^{\infty} \frac{(-1)^k (-0.3970991875025034370000)^k}{k}}{\log(0.9895136486640000)}$$

$$\phi^2 \log_{0.9895136486640000}\left(\frac{1.2058016249949931260000}{2}\right) = -94.86205377432\,\phi^2 \log(0.6029008124974965630000) - 1.00000000000000\,\phi^2 \log(0.6029008124974965630000) \sum_{k=0}^{\infty} (-0.0104863513360000)^k\, G(k)$$

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

From the inverse of the sum of the three results obtained, we obtain:

2(1/0.0026853199 + 1/41.507688953722 + 1/1.2058016249949)+29+7

Where 2, 7 and 29 are Lucas numbers

Input interpretation:

$$2\left(\frac{1}{0.0026853199} + \frac{1}{41.507688953722} + \frac{1}{1.2058016249949}\right) + 29 + 7$$

Result:

782.49705180588152461163659890924889095526209542181604149 99…

782.4970518… result practically equal to the rest mass of Omega meson 782.65

We note that:

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

1.644934^(12x)+47-2 = 782.497

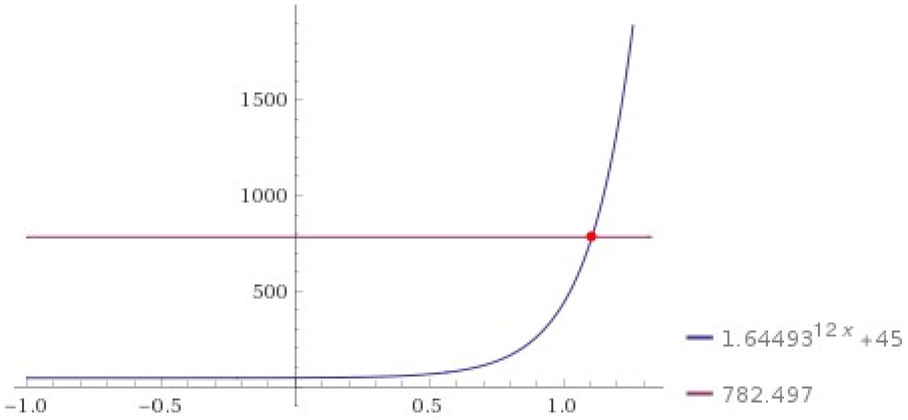
Input interpretation:

$1.644934^{12x} + 47 - 2 = 782.497$

Result:

$1.64493^{12x} + 45 = 782.497$

Plot:



Alternate form:

$e^{5.9724x} + 45 = 782.497$

Alternate form assuming x is positive:

$e^{5.9724x} = 737.497$

Alternate form assuming x is real:

$1.64493^{12x} + 45 = 782.497$

Real solution:

$x \approx 1.10563$

1.10563

Solution:

$x \approx (0.167437\, i)(6.28319\, n + (-6.60326\, i)), \quad n \in \mathbb{Z}$

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

And that: 1.10563 * 10^{-52} is the value of Cosmological Constant

4(1/0.0026853199 + 1/41.507688953722 + 1/1.2058016249949)+29+7+golden ratio^2

Where 4, 7 and 29 are Lucas numbers

Input interpretation:

$$4\left(\frac{1}{0.0026853199}+\frac{1}{41.507688953722}+\frac{1}{1.2058016249949}\right)+29+7+\phi^2$$

ϕ is the golden ratio

Result:

1531.6121...

1531.6121... result practically equal to the rest mass of Xi baryon 1531.80

Alternative representations:

$$4\left(\frac{1}{0.00268532}+\frac{1}{41.5076889537220000}+\frac{1}{1.20580162499490000}\right)+29+7+\phi^2 = 36+4\left(\frac{1}{0.00268532}+\frac{1}{1.20580162499490000}+\frac{1}{41.5076889537220000}\right)+(2\sin(54°))^2$$

$$4\left(\frac{1}{0.00268532}+\frac{1}{41.5076889537220000}+\frac{1}{1.20580162499490000}\right)+29+7+\phi^2 = 36+4\left(\frac{1}{0.00268532}+\frac{1}{1.20580162499490000}+\frac{1}{41.5076889537220000}\right)+(-2\cos(216°))^2$$

$$4\left(\frac{1}{0.00268532}+\frac{1}{41.5076889537220000}+\frac{1}{1.20580162499490000}\right)+29+7+\phi^2 = 36+4\left(\frac{1}{0.00268532}+\frac{1}{1.20580162499490000}+\frac{1}{41.5076889537220000}\right)+(-2\sin(666°))^2$$

Now, we have that:

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From:

$$\frac{\coth \pi}{1^3} + \frac{\coth 2\pi}{2^3} + \frac{\coth 3\pi}{3^3} + \&c = \frac{7\pi^3}{180}$$

((coth(9Pi)/729+coth(10Pi)/1000
+coth(11Pi)/1331+coth(12Pi)/1728+coth(13Pi)/2197+coth(14Pi)/2744
+coth(15Pi)/3375 +coth(16Pi)/4096)))

Input:

$$\frac{1}{729}\coth(9\pi) + \frac{\coth(10\pi)}{1000} + \frac{\coth(11\pi)}{1331} + \frac{\coth(12\pi)}{1728} + \frac{\coth(13\pi)}{2197} + \frac{\coth(14\pi)}{2744} + \frac{\coth(15\pi)}{3375} + \frac{\coth(16\pi)}{4096}$$

coth(x) is the hyperbolic cotangent function

Decimal approximation:

0.005061795160904405877552574734780462375652437028944639527...

0.00506179516….

Alternate forms:

$$(513\,537\,536\,512\,000 \coth(9\pi) + 374\,368\,864\,117\,248 \coth(10\pi) + 281\,268\,868\,608\,000 \coth(11\pi) + 216\,648\,648\,216\,000 \coth(12\pi) + 170\,400\,029\,184\,000 \coth(13\pi) + 136\,431\,801\,792\,000 \coth(14\pi) + 110\,924\,107\,886\,592 \coth(15\pi) + 91\,398\,648\,466\,125 \coth(16\pi))/374\,368\,864\,117\,248\,000$$

$$(8\,024\,024\,008\,000 \coth(9\pi) + 5\,849\,513\,501\,832 \coth(10\pi) + 4\,394\,826\,072\,000 \coth(11\pi) + 3\,385\,135\,128\,375 \coth(12\pi) + 2\,662\,500\,456\,000 \coth(13\pi) + 2\,131\,746\,903\,000 \coth(14\pi) + 1\,733\,189\,185\,728 \coth(15\pi))/5\,849\,513\,501\,832\,000 + \frac{\coth(16\pi)}{4096}$$

$$\frac{\cosh(9\pi)}{729 \sinh(9\pi)} + \frac{\cosh(10\pi)}{1000 \sinh(10\pi)} + \frac{\cosh(11\pi)}{1331 \sinh(11\pi)} + \frac{\cosh(12\pi)}{1728 \sinh(12\pi)} + \frac{\cosh(13\pi)}{2197 \sinh(13\pi)} + \frac{\cosh(14\pi)}{2744 \sinh(14\pi)} + \frac{\cosh(15\pi)}{3375 \sinh(15\pi)} + \frac{\cosh(16\pi)}{4096 \sinh(16\pi)}$$

cosh(x) is the hyperbolic cosine function

sinh(x) is the hyperbolic sine function

0.0050617951609044...

Partial result

((coth(Pi)/1+coth
(2Pi)/8+coth(3Pi)/27+coth(4Pi)/64+coth(5Pi)/125+coth(6Pi)/216+coth(7Pi)/343+coth
(8Pi)/512))+0.0050617951609044

Input interpretation:

$$\left(\frac{\coth(\pi)}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.0050617951609044$$

coth(x) is the hyperbolic cotangent function

Result:

1.203964784241347...

1.2039647842…. Final result

Alternative representations:

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000 = 0.00506179516090440000+i\cot(i\pi)+\frac{1}{8}i\cot(2i\pi)+\frac{1}{27}i\cot(3i\pi)+\frac{1}{64}i\cot(4i\pi)+\frac{1}{125}i\cot(5i\pi)+\frac{1}{216}i\cot(6i\pi)+\frac{1}{343}i\cot(7i\pi)+\frac{1}{512}i\cot(8i\pi)$$

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000 = 1.00506179516090440000+\frac{2}{-1+e^{2\pi}}+\frac{1}{8}\left(1+\frac{2}{-1+e^{4\pi}}\right)+\frac{1}{27}\left(1+\frac{2}{-1+e^{6\pi}}\right)+\frac{1}{64}\left(1+\frac{2}{-1+e^{8\pi}}\right)+\frac{1}{125}\left(1+\frac{2}{-1+e^{10\pi}}\right)+\frac{1}{216}\left(1+\frac{2}{-1+e^{12\pi}}\right)+\frac{1}{343}\left(1+\frac{2}{-1+e^{14\pi}}\right)+\frac{1}{512}\left(1+\frac{2}{-1+e^{16\pi}}\right)$$

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000 =$$
$$0.00506179516090440000 - i\cot(-i\pi)-\frac{1}{8}i\cot(-2i\pi)-\frac{1}{27}i\cot(-3i\pi)-\frac{1}{64}i\cot(-4i\pi)-\frac{1}{125}i\cot(-5i\pi)-\frac{1}{216}i\cot(-6i\pi)-\frac{1}{343}i\cot(-7i\pi)-\frac{1}{512}i\cot(-8i\pi)$$

Series representations:

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000 =$$
$$-1.1900984484008059984 - 2.3903204871234207969\sum_{k=1}^{\infty} q^{2k}$$
for $\left(q=e^{\pi} \text{ and } q=e^{2\pi} \text{ and } q=e^{3\pi} \text{ and } q=e^{4\pi} \text{ and } q=e^{5\pi} \text{ and } q=e^{6\pi} \text{ and } q=e^{7\pi} \text{ and } q=e^{8\pi}\right)$

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000 = 0.00506179516090440000 +$$
$$\sum_{k=-\infty}^{\infty}\left(\frac{1}{\pi+k^2\pi}+\frac{1}{16\pi+4k^2\pi}+\frac{1}{81\pi+9k^2\pi}+\frac{1}{256\pi+16k^2\pi}+\frac{1}{625\pi+25k^2\pi}+\frac{1}{1296\pi+36k^2\pi}+\frac{1}{2401\pi+49k^2\pi}+\frac{1}{4096\pi+64k^2\pi}\right)$$

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000 =$$
$$0.00506179516090440000+\sum_{k=0}^{\infty}\frac{1}{592704000\,k!}\left(k!\,\delta_k+(-1)^k\,2^{1+k}\,\text{Li}_{-k}\left(e^{-2z_0}\right)\right)\left(592704000(\pi-z_0)^k+74088000(2\pi-z_0)^k+21952000(3\pi-z_0)^k+9261000(4\pi-z_0)^k+4741632(5\pi-z_0)^k+2744000(6\pi-z_0)^k+1728000(7\pi-z_0)^k+1157625(8\pi-z_0)^k\right) \text{ for } \frac{i z_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$\left(\coth(\pi)\frac{1}{1}+\frac{1}{8}\coth(2\pi)+\frac{1}{27}\coth(3\pi)+\frac{1}{64}\coth(4\pi)+\frac{1}{125}\coth(5\pi)+\frac{1}{216}\coth(6\pi)+\frac{1}{343}\coth(7\pi)+\frac{1}{512}\coth(8\pi)\right)+0.00506179516090440000=$$

$$0.00506179516090440000+\int_{\frac{i\pi}{2}}^{7\pi}\left(-0.00291545189504373178\,\mathrm{csch}^2(t)-\frac{0.00195312500000000000\left(8\pi-\frac{i\pi}{2}\right)\mathrm{csch}^2\left(\frac{\frac{i\pi^2}{2}-8\pi t+\frac{i\pi t}{2}}{-7\pi+\frac{i\pi}{2}}\right)}{7\pi-\frac{i\pi}{2}}+\frac{1}{7\pi-\frac{i\pi}{2}}\left(5\pi-\frac{i\pi}{2}\right)\left(-0.00800000000000000000\,\mathrm{csch}^2\left(\frac{-i\pi^2-5\pi t+\frac{i\pi t}{2}}{-7\pi+\frac{i\pi}{2}}\right)-\frac{1}{5\pi-\frac{i\pi}{2}}0.00462962962962962963\left(6\pi-\frac{i\pi}{2}\right)\mathrm{csch}^2\left(\frac{\frac{i\pi^2}{2}-\frac{6\pi\left(-i\pi^2-5\pi t+\frac{i\pi t}{2}\right)}{-7\pi+\frac{i\pi}{2}}+\frac{i\pi\left(-i\pi^2-5\pi t+\frac{i\pi t}{2}\right)}{2\left(-7\pi+\frac{i\pi}{2}\right)}}{-5\pi+\frac{i\pi}{2}}\right)\right)+\frac{1}{7\pi-\frac{i\pi}{2}}\left(3\pi-\frac{i\pi}{2}\right)\left(-0.0370370370370370370\,\mathrm{csch}^2\left(\frac{-2i\pi^2-3\pi t+\frac{i\pi t}{2}}{-7\pi+\frac{i\pi}{2}}\right)-\frac{1}{3\pi-\frac{i\pi}{2}}0.0156250000000000000\left(4\pi-\frac{i\pi}{2}\right)\mathrm{csch}^2\left(\frac{\frac{i\pi^2}{2}-\frac{4\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{-7\pi+\frac{i\pi}{2}}+\frac{i\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{2\left(-7\pi+\frac{i\pi}{2}\right)}}{-3\pi+\frac{i\pi}{2}}\right)+\frac{1}{3\pi-\frac{i\pi}{2}}\left(\pi-\frac{i\pi}{2}\right)\left(-1.00000000000000000000\,\mathrm{csch}^2\left(\frac{-i\pi^2-\frac{\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{-7\pi+\frac{i\pi}{2}}+\frac{i\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{2\left(-7\pi+\frac{i\pi}{2}\right)}}{-3\pi+\frac{i\pi}{2}}\right)-\frac{1}{\pi-\frac{i\pi}{2}}0.125000000000000000\left(2\pi-\frac{i\pi}{2}\right)\mathrm{csch}^2\left(\frac{1}{-\pi+\frac{i\pi}{2}}\left(\frac{i\pi^2}{2}-\frac{2\pi\left(-i\pi^2-\frac{\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{-7\pi+\frac{i\pi}{2}}+\frac{i\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{2\left(-7\pi+\frac{i\pi}{2}\right)}\right)}{-3\pi+\frac{i\pi}{2}}+\frac{i\pi\left(-i\pi^2-\frac{\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{-7\pi+\frac{i\pi}{2}}+\frac{i\pi\left(-2i\pi^2-3\pi t+\frac{i\pi t}{2}\right)}{2\left(-7\pi+\frac{i\pi}{2}\right)}\right)}{2\left(-3\pi+\frac{i\pi}{2}\right)}\right)\right)\right)\right)\right)dt$$

Result, that is very near to the following expression:

7Pi^3/180

Input:

$$7 \times \frac{\pi^3}{180}$$

Exact result:

$$\frac{7\pi^3}{180}$$

Decimal approximation:

1.2057996486783263401574122526094987023087612220066430769940...

1.205799648678326….

Property:

$\frac{7\pi^3}{180}$ is a transcendental number

Alternative representations:

$$\frac{7\pi^3}{180} = \frac{7}{180}(180°)^3$$

$$\frac{7\pi^3}{180} = \frac{7}{180}(-i\log(-1))^3$$

$$\frac{7\pi^3}{180} = \frac{7}{180}\cos^{-1}(-1)^3$$

Series representations:

$$\frac{7\pi^3}{180} = -\frac{56}{45}\sum_{k=1}^{\infty}\frac{(-1)^k}{(-1+2k)^3}$$

$$\frac{7\pi^3}{180} = \frac{112}{45}\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3$$

$$\frac{7\pi^3}{180} = \frac{112}{45}\left(\sum_{k=0}^{\infty} \frac{(-1)^{1+k}\, 1195^{-1-2k}\left(5^{1+2k} - 4 \times 239^{1+2k}\right)}{1+2k}\right)^3$$

Integral representations:

$$\frac{7\pi^3}{180} = \frac{14}{45}\left(\int_0^{\infty} \frac{1}{1+t^2}\, dt\right)^3$$

$$\frac{7\pi^3}{180} = \frac{112}{45}\left(\int_0^{1} \sqrt{1-t^2}\, dt\right)^3$$

$$\frac{7\pi^3}{180} = \frac{14}{45}\left(\int_0^{1} \frac{1}{\sqrt{1-t^2}}\, dt\right)^3$$

coth(Pi)/1^7+coth(2Pi)/2^7+coth(3Pi)/3^7

Input:

$$\frac{\coth(\pi)}{1^7} + \frac{\coth(2\pi)}{2^7} + \frac{\coth(3\pi)}{3^7}$$

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

Exact result:

$$\coth(\pi) + \frac{1}{128}\coth(2\pi) + \frac{\coth(3\pi)}{2187}$$

Decimal approximation:

1.0120116750640188133872938559707352814155255078665145594451...

1.0120116750640….

Property:

$\coth(\pi) + \frac{1}{128}\coth(2\pi) + \frac{\coth(3\pi)}{2187}$ is a transcendental number

Alternate forms:

$$\frac{279\,936\coth(\pi)+2187\coth(2\pi)+128\coth(3\pi)}{279\,936}$$

$$\frac{1}{128}(128\coth(\pi)+\coth(2\pi))+\frac{\coth(3\pi)}{2187}$$

$$\frac{(562\,059+842\,123\cosh(2\pi)+282\,251\cosh(4\pi))\operatorname{csch}(\pi)\operatorname{sech}(\pi)}{559\,872\,(1+2\cosh(2\pi))}$$

Alternative representations:

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=\frac{i\cot(i\pi)}{1^7}+\frac{i\cot(2i\pi)}{2^7}+\frac{i\cot(3i\pi)}{3^7}$$

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=\frac{1+\frac{2}{-1+e^{2\pi}}}{1^7}+\frac{1+\frac{2}{-1+e^{4\pi}}}{2^7}+\frac{1+\frac{2}{-1+e^{6\pi}}}{3^7}$$

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=-\frac{i\cot(-i\pi)}{1^7}-\frac{i\cot(-2i\pi)}{2^7}-\frac{i\cot(-3i\pi)}{3^7}$$

Series representations:

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=\frac{282\,251}{279\,936}+\sum_{k=0}^{\infty}\left(\frac{2e^{-6(1+k)\pi}}{2187}+\frac{1}{64}e^{-4(1+k)\pi}+2e^{-2(1+k)\pi}\right)$$

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=\sum_{k=-\infty}^{\infty}\left(\frac{1}{\pi+k^2\pi}+\frac{1}{256\pi+64k^2\pi}+\frac{1}{6561\pi+729k^2\pi}\right)$$

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=\frac{1\,686\,433}{1\,679\,616\pi}+\sum_{k=1}^{\infty}\left(\frac{2}{729(9+k^2)\pi}+\frac{2}{\pi+k^2\pi}+\frac{1}{128\pi+32k^2\pi}\right)$$

Integral representation:

$$\frac{\coth(\pi)}{1^7}+\frac{\coth(2\pi)}{2^7}+\frac{\coth(3\pi)}{3^7}=$$
$$\int_{\frac{i\pi}{2}}^{3\pi}\left(-\frac{\operatorname{csch}^2(t)}{2187}+\left(\frac{13}{37}-\frac{4i}{37}\right)\left(-\operatorname{csch}^2\left(\frac{\left(\frac{12}{37}+\frac{2i}{37}\right)\left(-i\pi^2-\left(1-\frac{i}{2}\right)\pi t\right)}{\pi}\right)-\left(\frac{9}{640}+\frac{i}{320}\right)\operatorname{csch}^2\left(\frac{\left(\frac{4}{5}+\frac{2i}{5}\right)\left(\frac{i\pi^2}{2}+\left(\frac{25}{37}-\frac{2i}{37}\right)\left(-i\pi^2-\left(1-\frac{i}{2}\right)\pi t\right)\right)}{\pi}\right)\right)\right)dt$$

Result that is very near to the following expression:

19Pi^7/56700

Input:

$$19\times\frac{\pi^7}{56700}$$

Exact result:

$$\frac{19\pi^7}{56700}$$

Decimal approximation:

1.012091205075115507632626514433312077714836279199517513092...

1.0120912050751…

Property:

$\frac{19\pi^7}{56700}$ is a transcendental number

Alternative representations:

$$\frac{19\pi^7}{56700}=\frac{19(180°)^7}{56700}$$

$$\frac{19\pi^7}{56700}=\frac{19(-i\log(-1))^7}{56700}$$

$$\frac{19\pi^7}{56700}=\frac{19\cos^{-1}(-1)^7}{56700}$$

Series representations:

$$\frac{19\pi^7}{56700} = \frac{77824\left(\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}\right)^7}{14175}$$

$$\frac{19\pi^7}{56700} = \frac{19\left(\sum_{k=0}^{\infty} -\frac{4(-1)^k\, 1195^{-1-2k}\left(5^{1+2k} - 4\times 239^{1+2k}\right)}{1+2k}\right)^7}{56700}$$

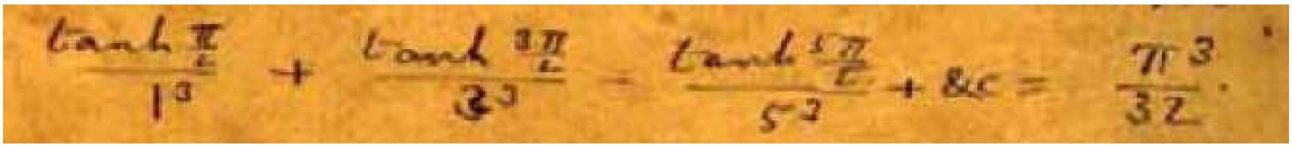
$$\frac{19\pi^7}{56700} = \frac{19\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^7}{56700}$$

Integral representations:

$$\frac{19\pi^7}{56700} = \frac{608\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^7}{14175}$$

$$\frac{19\pi^7}{56700} = \frac{77824\left(\int_0^1\sqrt{1-t^2}\,dt\right)^7}{14175}$$

$$\frac{19\pi^7}{56700} = \frac{608\left(\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt\right)^7}{14175}$$



$$\frac{\tanh\frac{\pi}{2}}{1^3} + \frac{\tanh\frac{3\pi}{2}}{3^3} - \frac{\tanh\frac{5\pi}{2}}{5^3} + \&c = \frac{\pi^3}{32}.$$

tanh(Pi/2) / 1^3 + tanh(3Pi/2) / 3^3 – tanh(5Pi/2) / 5^3

Input:

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3} + \frac{\tanh\left(3\times\frac{\pi}{2}\right)}{3^3} - \frac{\tanh\left(5\times\frac{\pi}{2}\right)}{5^3}$$

$\tanh(x)$ is the hyperbolic tangent function

Exact result:

$$\tanh\left(\frac{\pi}{2}\right) + \frac{1}{27}\tanh\left(\frac{3\pi}{2}\right) - \frac{1}{125}\tanh\left(\frac{5\pi}{2}\right)$$

Decimal approximation:

0.946183397855858388463387564942550238862188023168537825736...

0.946183397855858…

Property:

$\tanh\left(\frac{\pi}{2}\right) + \frac{1}{27}\tanh\left(\frac{3\pi}{2}\right) - \frac{1}{125}\tanh\left(\frac{5\pi}{2}\right)$ is a transcendental number

Alternate forms:

$$\frac{3375\tanh\left(\frac{\pi}{2}\right) + 125\tanh\left(\frac{3\pi}{2}\right) - 27\tanh\left(\frac{5\pi}{2}\right)}{3375}$$

$$\frac{\sinh(\pi)}{1+\cosh(\pi)} + \frac{\sinh(3\pi)}{27(1+\cosh(3\pi))} - \frac{\sinh(5\pi)}{125(1+\cosh(5\pi))}$$

$$\frac{\sinh\left(\frac{\pi}{2}\right)}{\cosh\left(\frac{\pi}{2}\right)} + \frac{\sinh\left(\frac{3\pi}{2}\right)}{27\cosh\left(\frac{3\pi}{2}\right)} - \frac{\sinh\left(\frac{5\pi}{2}\right)}{125\cosh\left(\frac{5\pi}{2}\right)}$$

Alternative representations:

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3} + \frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3} - \frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3} = -\frac{-1+\frac{2}{1+e^{-5\pi}}}{5^3} + \frac{1}{27}\left(-1+\frac{2}{1+e^{-3\pi}}\right) + \frac{1}{1}\left(-1+\frac{2}{1+e^{-\pi}}\right)$$

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3} + \frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3} - \frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3} = \frac{1}{\coth\left(\frac{\pi}{2}\right)} + \frac{1}{27\coth\left(\frac{3\pi}{2}\right)} - \frac{1}{\coth\left(\frac{5\pi}{2}\right)5^3}$$

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3} + \frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3} - \frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3} = \coth\left(\frac{\pi}{2} - \frac{i\pi}{2}\right)\frac{1}{1} + \frac{1}{27}\coth\left(\frac{3\pi}{2} - \frac{i\pi}{2}\right) - \frac{\coth\left(\frac{5\pi}{2} - \frac{i\pi}{2}\right)}{5^3}$$

Series representations:

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3}+\frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3}-\frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3}=\sum_{k=1}^{\infty}\frac{4\left(\frac{225}{1+(1-2k)^2}+\frac{25}{9+(1-2k)^2}-\frac{9}{25+(1-2k)^2}\right)}{225\,\pi}$$

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3}+\frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3}-\frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3}= \frac{3473}{3375}+\sum_{k=0}^{\infty}\left(\frac{2}{125}\,e^{(-5-(5-i)k)\pi}-\frac{2}{27}\,e^{(-3-(3-i)k)\pi}-2\,e^{(-1-(1-i)k)\pi}\right)$$

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3}+\frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3}-\frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3}= \sum_{k=0}^{\infty}\left(-\left(\delta_k+\frac{2^{1+k}\,\mathrm{Li}_{-k}\left(-e^{2z_0}\right)}{k!}\right)\left(\frac{\pi}{2}-z_0\right)^k-\frac{1}{27}\left(\delta_k+\frac{2^{1+k}\,\mathrm{Li}_{-k}\left(-e^{2z_0}\right)}{k!}\right)\left(\frac{3\pi}{2}-z_0\right)^k+\frac{1}{125}\left(\delta_k+\frac{2^{1+k}\,\mathrm{Li}_{-k}\left(-e^{2z_0}\right)}{k!}\right)\left(\frac{5\pi}{2}-z_0\right)^k\right)\quad \text{for } \frac{1}{2}+\frac{i z_0}{\pi}\notin\mathbb{Z}$$

Integral representation:

$$\frac{\tanh\left(\frac{\pi}{2}\right)}{1^3}+\frac{\tanh\left(\frac{3\pi}{2}\right)}{3^3}-\frac{\tanh\left(\frac{5\pi}{2}\right)}{5^3}=\int_0^{\frac{5\pi}{2}}\left(\frac{1}{5}\left(\mathrm{sech}^2\left(\frac{t}{5}\right)+\frac{1}{9}\,\mathrm{sech}^2\left(\frac{3t}{5}\right)\right)-\frac{\mathrm{sech}^2(t)}{125}\right)dt$$

Result that is very near to the expression:

Pi^3/32

Input:

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

Decimal approximation:

0.968946146259369380483634845846918600069540267683909615442...

0.96894614625936….. result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 (see Appendix) and to the value of the following Rogers-Ramanujan continued fraction:

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

From:

Astronomy & Astrophysics manuscript no. ms c ESO 2019 - September 24, 2019
Planck 2018 results. VI. Cosmological parameters

The primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index $n_s = 0.965 \pm 0.004$, consistent with the predictions of slow-roll, single-field, inflation.

Property:

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

Alternative representations:

$$\frac{\pi^3}{32} = \frac{1}{32}(180°)^3$$

$$\frac{\pi^3}{32} = \frac{1}{32}(-i\log(-1))^3$$

$$\frac{\pi^3}{32} = \frac{1}{32}\cos^{-1}(-1)^3$$

Series representations:

$$\frac{\pi^3}{32} = -\sum_{k=1}^{\infty}\frac{(-1)^k}{(-1+2k)^3}$$

$$\frac{\pi^3}{32} = 2\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3$$

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

Integral representations:

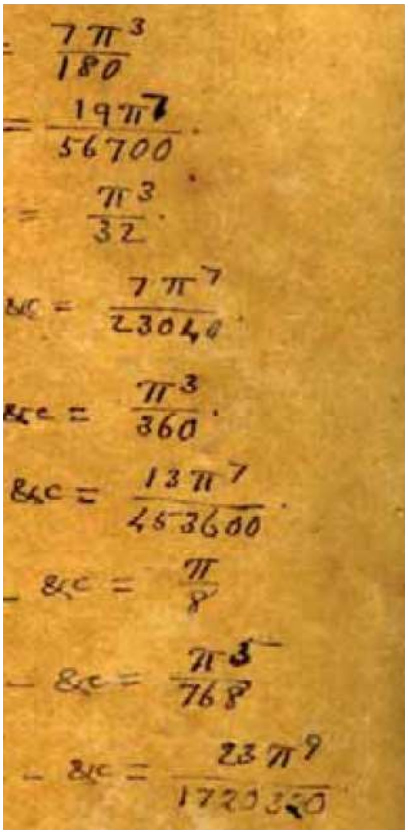
$$\frac{\pi^3}{32} = 2\left(\int_0^1 \sqrt{1-t^2}\, dt\right)^3$$

$$\frac{\pi^3}{32} = \frac{1}{4}\left(\int_0^\infty \frac{1}{1+t^2}\, dt\right)^3$$

$$\frac{\pi^3}{32} = \frac{1}{4}\left(\int_0^1 \frac{1}{\sqrt{1-t^2}}\, dt\right)^3$$

and so on....

Now, we take the following formulas:



We obtain:

(7Pi^3/180 + 19Pi^7/56700 + Pi^3/32 + 7Pi^7/23040 + Pi^3/360 + 13Pi^7/453600 + Pi/8 + Pi^5/768 + 23Pi^9/1720320)

Input:

$$7\times\frac{\pi^3}{180}+19\times\frac{\pi^7}{56\,700}+\frac{\pi^3}{32}+7\times\frac{\pi^7}{23\,040}+\frac{\pi^3}{360}+13\times\frac{\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+23\times\frac{\pi^9}{1\,720\,320}$$

Result:

$$\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\,\pi^7}{483\,840}+\frac{23\,\pi^9}{1\,720\,320}$$

Decimal approximation:

5.466847904823804741099068879713819695762431008809037906255...

5.4668479048238….

Property:

$\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\,\pi^7}{483\,840}+\frac{23\,\pi^9}{1\,720\,320}$ is a transcendental number

Alternate form:

$$\frac{\pi\left(1\,935\,360+1\,128\,960\,\pi^2+20\,160\,\pi^4+10\,336\,\pi^6+207\,\pi^8\right)}{15\,482\,880}$$

Alternative representations:

$$\frac{7\pi^3}{180}+\frac{19\pi^7}{56\,700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23\,040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1\,720\,320}=\frac{1}{8}\cos^{-1}(-1)+\frac{1}{32}\cos^{-1}(-1)^3+\frac{7}{180}\cos^{-1}(-1)^3+\frac{1}{360}\cos^{-1}(-1)^3+\frac{1}{768}\cos^{-1}(-1)^5+\frac{7\cos^{-1}(-1)^7}{23\,040}+\frac{19\cos^{-1}(-1)^7}{56\,700}+\frac{13\cos^{-1}(-1)^7}{453\,600}+\frac{23\cos^{-1}(-1)^9}{1\,720\,320}$$

$$\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}=$$
$$\frac{2E(0)}{8}+\frac{1}{32}(2E(0))^3+\frac{7}{180}(2E(0))^3+\frac{1}{360}(2E(0))^3+$$
$$\frac{1}{768}(2E(0))^5+\frac{7(2E(0))^7}{23040}+\frac{19(2E(0))^7}{56700}+\frac{13(2E(0))^7}{453600}+\frac{23(2E(0))^9}{1720320}$$

$$\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}=$$
$$\frac{2K(0)}{8}+\frac{1}{32}(2K(0))^3+\frac{7}{180}(2K(0))^3+\frac{1}{360}(2K(0))^3+$$
$$\frac{1}{768}(2K(0))^5+\frac{7(2K(0))^7}{23040}+\frac{19(2K(0))^7}{56700}+\frac{13(2K(0))^7}{453600}+\frac{23(2K(0))^9}{1720320}$$

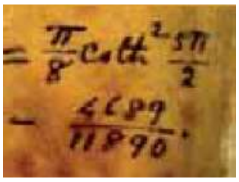
Series representations:

$$\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}=$$
$$\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{323\pi^7}{483840}+\frac{23\pi^9}{1720320}-\frac{7}{3}\sum_{k=1}^{\infty}\frac{(-1)^k}{(-1+2k)^3}$$

$$\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}=$$
$$\frac{1}{1890}\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)\left(945+8820\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2+\right.$$
$$\left.2520\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^4+20672\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^6+6624\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8\right)$$

$$\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}=$$
$$\frac{1}{15482880}\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)$$
$$\left(1935360+1128960\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2+\right.$$
$$20160\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^4+$$
$$10336\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^6+$$
$$\left.207\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^8\right)$$

And adding


$= \frac{\pi}{8}\coth^2\frac{5\pi}{2} - \frac{4689}{11890}.$

We obtain:

(7Pi^3/180 + 19Pi^7/56700 + Pi^3/32 + 7Pi^7/23040 + Pi^3/360 + 13Pi^7/453600 + Pi/8 + Pi^5/768 + 23Pi^9/1720320) - Pi/8coth^2(5Pi/2)-(4689/11890)

Input:

$$\left(7\times\frac{\pi^3}{180}+19\times\frac{\pi^7}{56\,700}+\frac{\pi^3}{32}+7\times\frac{\pi^7}{23\,040}+\frac{\pi^3}{360}+13\times\frac{\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+23\times\frac{\pi^9}{1\,720\,320}\right)-\frac{\pi}{8}\coth^2\left(5\times\frac{\pi}{2}\right)-\frac{4689}{11\,890}$$

Exact result:

$$-\frac{4689}{11\,890}+\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\pi^7}{483\,840}+\frac{23\pi^9}{1\,720\,320}-\frac{1}{8}\pi\coth^2\left(\frac{5\pi}{2}\right)$$

Decimal approximation:

4.679783573787645779800838858616026684415914835818889278548...

4.6797835737876….

Alternate forms:

$$\frac{1}{18\,409\,144\,320}\left(-7\,259\,922\,432+2\,301\,143\,040\,\pi+1\,342\,333\,440\,\pi^3+23\,970\,240\,\pi^5+12\,289\,504\,\pi^7+246\,123\,\pi^9-2\,301\,143\,040\,\pi\coth^2\left(\frac{5\pi}{2}\right)\right)$$

$$-\frac{4689}{11\,890}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\pi^7}{483\,840}+\frac{23\pi^9}{1\,720\,320}-\frac{1}{8}\pi\,\text{csch}^2\left(\frac{5\pi}{2}\right)$$

$$\frac{1}{18\,409\,144\,320}\left(-7\,259\,922\,432+2\,301\,143\,040\,\pi+1\,342\,333\,440\,\pi^3+23\,970\,240\,\pi^5+12\,289\,504\,\pi^7+246\,123\,\pi^9\right)-\frac{1}{8}\pi\coth^2\left(\frac{5\pi}{2}\right)$$

csch(x) is the hyperbolic cosecant function

Alternative representations:

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56\,700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23\,040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1\,720\,320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11\,890}=\frac{\pi}{8}-\frac{4689}{11\,890}+\frac{\pi^3}{32}+\frac{7\pi^3}{180}+\frac{\pi^3}{360}+\frac{\pi^5}{768}+\frac{7\pi^7}{23\,040}+\frac{19\pi^7}{56\,700}+\frac{13\pi^7}{453\,600}+\frac{23\pi^9}{1\,720\,320}-\frac{1}{8}\pi\left(1+\frac{2}{-1+e^{5\pi}}\right)^2$$

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56\,700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23\,040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1\,720\,320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11\,890}=\frac{\pi}{8}-\frac{4689}{11\,890}+\frac{\pi^3}{32}+\frac{7\pi^3}{180}+\frac{\pi^3}{360}+\frac{\pi^5}{768}+\frac{7\pi^7}{23\,040}+\frac{19\pi^7}{56\,700}+\frac{13\pi^7}{453\,600}+\frac{23\pi^9}{1\,720\,320}-\frac{1}{8}\pi\left(i\cot\left(\frac{5i\pi}{2}\right)\right)^2$$

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56\,700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23\,040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1\,720\,320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11\,890}=\frac{\pi}{8}-\frac{4689}{11\,890}+\frac{\pi^3}{32}+\frac{7\pi^3}{180}+\frac{\pi^3}{360}+\frac{\pi^5}{768}+\frac{7\pi^7}{23\,040}+\frac{19\pi^7}{56\,700}+\frac{13\pi^7}{453\,600}+\frac{23\pi^9}{1\,720\,320}-\frac{1}{8}\pi\left(-i\cot\left(-\frac{5i\pi}{2}\right)\right)^2$$

Series representations:

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56\,700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23\,040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1\,720\,320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11\,890}=-\frac{4689}{11\,890}+\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\pi^7}{483\,840}+\frac{23\pi^9}{1\,720\,320}-\frac{25}{2}\pi\left(\sum_{k=-\infty}^{\infty}\frac{1}{25\pi+4k^2\pi}\right)^2$$

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56\,700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23\,040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453\,600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1\,720\,320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11\,890}=\frac{1}{18\,409\,144\,320}\left(-7\,259\,922\,432+1\,342\,333\,440\pi^3+23\,970\,240\pi^5+12\,289\,504\pi^7+246\,123\pi^9-9\,204\,572\,160\pi\sum_{k=1}^{\infty}q^{2k}-9\,204\,572\,160\pi\left(\sum_{k=1}^{\infty}q^{2k}\right)^2\right)\quad\text{for } q=e^{(5\pi)/2}$$

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11890}=\frac{1}{18409144320}\left(-7259922432+1342333440\pi^3+23970240\pi^5+12289504\pi^7+246123\pi^9-9204572160\pi\sum_{k=0}^{\infty}e^{-5(1+k)\pi}-9204572160\pi\left(\sum_{k=0}^{\infty}e^{-5(1+k)\pi}\right)^2\right)$$

Integral representation:

$$\left(\frac{7\pi^3}{180}+\frac{19\pi^7}{56700}+\frac{\pi^3}{32}+\frac{7\pi^7}{23040}+\frac{\pi^3}{360}+\frac{13\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+\frac{23\pi^9}{1720320}\right)-\frac{1}{8}\coth^2\left(\frac{5\pi}{2}\right)\pi-\frac{4689}{11890}=-\frac{4689}{11890}+\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\pi^7}{483840}+\frac{23\pi^9}{1720320}-\frac{1}{8}\pi\left(\int_{\frac{i\pi}{2}}^{\frac{5\pi}{2}}\operatorname{csch}^2(t)\,dt\right)^2$$

From which, we obtain:

[((((((7Pi^3/180 + 19Pi^7/56700 + Pi^3/32 + 7Pi^7/23040 + Pi^3/360 + 13Pi^7/453600 + Pi/8 + Pi^5/768 + 23Pi^9/1720320) - Pi/8coth^2(5Pi/2)-(4689/11890)))))]^5+29+11+golden ratio

Where 29 and 11 is a Lucas number

Input:

$$\left(\left(7\times\frac{\pi^3}{180}+19\times\frac{\pi^7}{56700}+\frac{\pi^3}{32}+7\times\frac{\pi^7}{23040}+\frac{\pi^3}{360}+13\times\frac{\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+23\times\frac{\pi^9}{1720320}\right)-\frac{\pi}{8}\coth^2\left(5\times\frac{\pi}{2}\right)-\frac{4689}{11890}\right)^5+29+11+\phi$$

coth(x) is the hyperbolic cotangent function

ϕ is the golden ratio

Exact result:

$$\phi+40+\left(-\frac{4689}{11890}+\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\pi^7}{483840}+\frac{23\pi^9}{1720320}-\frac{1}{8}\pi\coth^2\left(\frac{5\pi}{2}\right)\right)^5$$

Decimal approximation:

2286.1657559177701784559045106712013550530875335528323458 61...

2286.16575591..... result practically equal to the rest mass of charmed Lambda baryon 2286.46

And:

[((((((7Pi^3/180 + 19Pi^7/56700 + Pi^3/32 + 7Pi^7/23040 + Pi^3/360 + 13Pi^7/453600 + Pi/8 + Pi^5/768 + 23Pi^9/1720320) - Pi/8coth^2(5Pi/2)-(4689/11890)))))]^6-(843+199+47+18-golden ratio)

Input:

$$\left(\left(7\times\frac{\pi^3}{180}+19\times\frac{\pi^7}{56700}+\frac{\pi^3}{32}+7\times\frac{\pi^7}{23040}+\frac{\pi^3}{360}+13\times\frac{\pi^7}{453600}+\frac{\pi}{8}+\frac{\pi^5}{768}+23\times\frac{\pi^9}{1720320}\right)-\frac{\pi}{8}\coth^2\left(5\times\frac{\pi}{2}\right)-\frac{4689}{11890}\right)^6-(843+199+47+18-\phi)$$

Exact result:

$$\phi-1107+\left(-\frac{4689}{11890}+\frac{\pi}{8}+\frac{7\pi^3}{96}+\frac{\pi^5}{768}+\frac{323\pi^7}{483840}+\frac{23\pi^9}{1720320}-\frac{1}{8}\pi\coth^2\left(\frac{5\pi}{2}\right)\right)^6$$

Decimal approximation:

9398.6155936546594307982994664471677475766905586294214528 47...

9398.61559365…..

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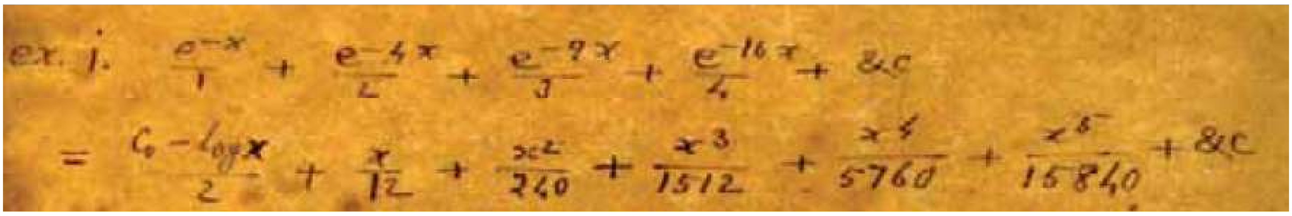

ex. i. $\frac{e^{-x}}{1}+\frac{e^{-4x}}{2}+\frac{e^{-9x}}{3}+\frac{e^{-16x}}{4}+\&c$

$=\frac{C_0-\log x}{2}+\frac{x}{12}+\frac{x^2}{240}+\frac{x^3}{1512}+\frac{x^4}{5760}+\frac{x^5}{15840}+\&c$

(x-ln(2))/2 + 2/12 + 2^2/240 + 2^3/1512 + 2^4/5760 + 2^5/15840 = 0

Input:

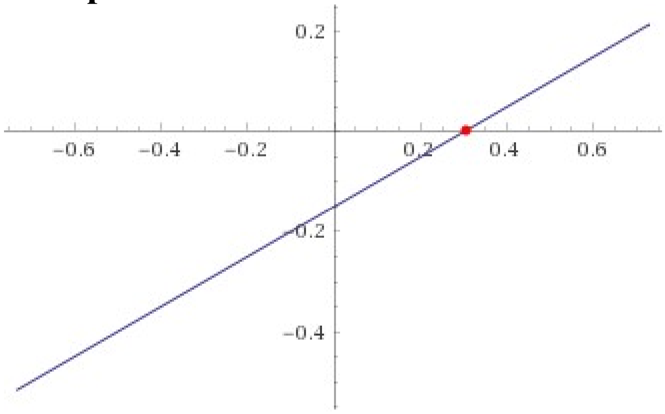
$$\frac{1}{2}(x-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}=0$$

log(x) is the natural logarithm

Exact result:

$$\frac{1}{2}(x - \log(2)) + \frac{3217}{16632} = 0$$

Root plot:



Alternate forms:

$$\frac{8316x + 3217 - 8316\log(2)}{16632} = 0$$

$$\frac{x}{2} + \frac{3217}{16632} - \frac{\log(2)}{2} = 0$$

$$\frac{8316x + 3217}{16632} - \frac{\log(2)}{2} = 0$$

Solution:

$x \approx 0.30630$

x = 0.30630

(0.30630-ln(2))/2 + 2/12 + 2^2/240 + 2^3/1512 + 2^4/5760 + 2^5/15840

Input:

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15840}$$

$\log(x)$ is the natural logarithm

Result:

$-1.27186\ldots \times 10^{-6}$

Alternative representations:

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = \frac{1}{2}\left(0.3063 - \log_e(2)\right) + \frac{2}{12} + \frac{4}{240} + \frac{8}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840}$$

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = \frac{1}{2}(0.3063 - \log(a)\log_a(2)) + \frac{2}{12} + \frac{4}{240} + \frac{8}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840}$$

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = \frac{1}{2}(0.3063 + \mathrm{Li}_1(-1)) + \frac{2}{12} + \frac{4}{240} + \frac{8}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840}$$

Series representations:

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = 0.346572 - i\left(\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right) - 0.5\log(x) + 0.5\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = 0.346572 - \frac{1}{2}\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) - \frac{\log(z_0)}{2} - \frac{1}{2}\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\log(z_0) + \frac{1}{2}\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}$$

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = 0.346572 - i\left(\pi\left\lfloor-\frac{-\pi + \arg\left(\frac{2}{z_0}\right) + \arg(z_0)}{2\pi}\right\rfloor\right) - 0.5\log(z_0) + 0.5\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = 0.346572 - 0.5\int_1^2 \frac{1}{t}\,dt$$

$$\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840} = 0.346572 - \frac{0.25}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1 < \gamma < 0$$

And:

-1/4/((((((0.30630-ln(2))/2 + 2/12 + 2^2/240 + 2^3/1512 + 2^4/5760 + 2^5/15840)))))+322-1/golden ratio

Where 322 is a Lucas number

Input:

$$-\frac{1}{4\left(\frac{1}{2}(0.3063 - \log(2)) + \frac{2}{12} + \frac{2^2}{240} + \frac{2^3}{1512} + \frac{2^4}{5760} + \frac{2^5}{15\,840}\right)} + 322 - \frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Result:

196884.2592408927635890066612381992381217796245487794663762...

196884.25924…. 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)

Alternative representations:

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=322-\frac{1}{\phi}-\frac{1}{4\left(\frac{1}{2}(0.3063-\log_e(2))+\frac{2}{12}+\frac{4}{240}+\frac{8}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}$$

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=322-\frac{1}{\phi}-\frac{1}{4\left(\frac{1}{2}(0.3063+\operatorname{Li}_1(-1))+\frac{2}{12}+\frac{4}{240}+\frac{8}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}$$

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=322-\frac{1}{\phi}-\frac{1}{4\left(\frac{1}{2}(0.3063-2\coth^{-1}(3))+\frac{2}{12}+\frac{4}{240}+\frac{8}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}$$

Series representations:

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=322-\frac{1}{\phi}+\frac{0.25}{-0.346572+i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor+0.5\log(x)-0.5\sum_{k=1}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}}{k}}\quad\text{for } x<0$$

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=322-\frac{1}{\phi}+\frac{0.5}{-0.693145+\log(z_0)+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}}$$

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=$$
$$322-\frac{1}{\phi}+\frac{0.25}{-0.346572+i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{2}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+0.5\log(z_0)-0.5\sum_{k=1}^{\infty}\frac{(-1)^k(2-z_0)^k z_0^{-k}}{k}}$$

Integral representation:

$$-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}=$$
$$322-\frac{1}{\phi}-\frac{0.72135\,i\pi}{i\pi-0.72135\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}\quad\text{for } -1<\gamma<0$$

We have also:

ln((((-1/4/((((((0.30630-ln(2))/2 + 2/12 + 2^2/240 + 2^3/1512 + 2^4/5760 + 2^5/15840)))))+322-1/golden ratio))))

Input:

$$\log\left(-\frac{1}{4\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}+322-\frac{1}{\phi}\right)$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Result:

12.19037131852096083796367055439415562013454512074538871531...

Result:

12.1904...

12.1904… result equal to the black hole entropy 12.1904

Alternative representations:

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$\log_e\left(322-\frac{1}{\phi}-\frac{1}{4\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{4}{240}+\frac{8}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}\right)$$

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$\log(a)\log_a\left(322-\frac{1}{\phi}-\frac{1}{4\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{4}{240}+\frac{8}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}\right)$$

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$-\mathrm{Li}_1\left(-321+\frac{1}{\phi}+\frac{1}{4\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{4}{240}+\frac{8}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)}\right)$$

Series representations:

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$\log\left(\frac{321\,(0.00215933+\phi(-0.691587+\log(2))-0.00311526\log(2))}{\phi(-0.693145+\log(2))}\right)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-5.77144k}\left(\frac{0.00215933+\phi(-0.691587+\log(2))-0.00311526\log(2)}{\phi(-0.693145+\log(2))}\right)^{-k}}{k}$$

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$2i\pi\left\lfloor\frac{\arg\left(\frac{0.693145-\log(2)+\phi(-222.693+0.693145x+322\log(2)-x\log(2))}{\phi(-0.693145+\log(2))}\right)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}\left(\frac{0.693145-\log(2)+\phi(-222.693+x(0.693145-\log(2))+322\log(2))}{\phi(-0.693145+\log(2))}\right)^k}{k}\quad\text{for } x<0$$

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$2i\pi\left\lfloor-\frac{-\pi+\arg\left(\frac{322(0.00215262+\phi(-0.691592+\log(2))-0.00310559\log(2))}{\phi(-0.693145+\log(2))z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k z_0^{-k}\left(\frac{0.693145-\log(2)+\phi(-222.693+322\log(2)+(0.693145-\log(2))z_0)}{\phi(-0.693145+\log(2))}\right)^k}{k}$$

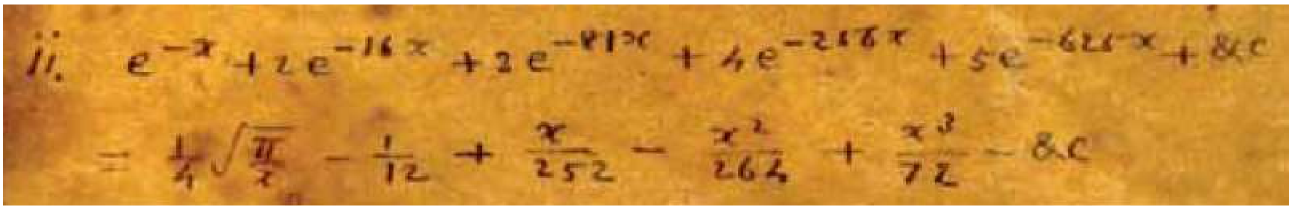
Integral representations:

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=$$
$$\int_1^{\frac{322(0.00215262+\phi(-0.691592+\log(2))-0.00310559\log(2))}{\phi(-0.693145+\log(2))}}\frac{1}{t}\,dt$$

$$\log\left(-\frac{1}{\left(\frac{1}{2}(0.3063-\log(2))+\frac{2}{12}+\frac{2^2}{240}+\frac{2^3}{1512}+\frac{2^4}{5760}+\frac{2^5}{15840}\right)4}+322-\frac{1}{\phi}\right)=\frac{1}{2i\pi}$$
$$\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-5.77144s}\,\Gamma(-s)^2\,\Gamma(1+s)\left(\frac{0.00215933+\phi(-0.691587+\log(2))-0.00311526\log(2)}{\phi(-0.693145+\log(2))}\right)^{-s}}{\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

Now, we have that



$$ii.\quad e^{-x}+2e^{-16x}+2e^{-81x}+4e^{-256x}+5e^{-625x}+\&c=\frac{1}{4}\sqrt{\frac{\pi}{x}}-\frac{1}{12}+\frac{x}{252}-\frac{x^2}{264}+\frac{x^3}{72}-\&c$$

For x = 2, we obtain:

e^-2 + 2e^-32 + 2e^-162 + 4e^-512 + 5e^-1250 = 1/4*sqrt(Pi/2) – 1/12 + 2/252 – 4/264 + 8/72

e^-2 + 2e^-32 + 2e^-162 + 4e^-512 + 5e^-1250

Input:

$$\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}$$

Decimal approximation:

0.135335283236638020225097683323930645215943476102340153135...

0.13533528323…

Property:

$$\frac{5}{e^{1250}} + \frac{4}{e^{512}} + \frac{2}{e^{162}} + \frac{2}{e^{32}} + \frac{1}{e^2} \text{ is a transcendental number}$$

Alternate form:

$$\frac{5 + 4 e^{738} + 2 e^{1088} + 2 e^{1218} + e^{1248}}{e^{1250}}$$

Alternative representation:

$$\frac{1}{e^2} + \frac{2}{e^{32}} + \frac{2}{e^{162}} + \frac{4}{e^{512}} + \frac{5}{e^{1250}} = \frac{1}{\exp^2(z)} + \frac{2}{\exp^{32}(z)} + \frac{2}{\exp^{162}(z)} + \frac{4}{\exp^{512}(z)} + \frac{5}{\exp^{1250}(z)} \text{ for } z = 1$$

1/4*sqrt(Pi/2) – 1/12 + 2/252 – 4/264 + 8/72

Input:

$$\frac{1}{4}\sqrt{\frac{\pi}{2}} - \frac{1}{12} + \frac{2}{252} - \frac{4}{264} + \frac{8}{72}$$

Exact result:

$$\frac{19}{924} + \frac{\sqrt{\frac{\pi}{2}}}{4}$$

Decimal approximation:

0.333891304891645625572533431164151219396436113139012852349...

0.33389130489…

Property:

$$\frac{19}{924} + \frac{\sqrt{\frac{\pi}{2}}}{4} \text{ is a transcendental number}$$

Alternate forms:

$$\frac{38 + 231\sqrt{2\pi}}{1848}$$

$$\frac{19\sqrt{2} + 231\sqrt{\pi}}{924\sqrt{2}}$$

Series representations:

$$\frac{\sqrt{\frac{\pi}{2}}}{4}-\frac{1}{12}+\frac{2}{252}-\frac{4}{264}+\frac{8}{72}=\frac{19}{924}+\frac{1}{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k(-2+\pi)^k\left(-\frac{1}{2}\right)_k}{k!}$$

$$\frac{\sqrt{\frac{\pi}{2}}}{4}-\frac{1}{12}+\frac{2}{252}-\frac{4}{264}+\frac{8}{72}=\frac{19}{924}+\frac{1}{4}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k(\pi-2z_0)^k z_0^{-k}}{k!}$$

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

$$\frac{\sqrt{\frac{\pi}{2}}}{4}-\frac{1}{12}+\frac{2}{252}-\frac{4}{264}+\frac{8}{72}=\frac{19}{924}-\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-j}2^s(-2+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{8\sqrt{\pi}}$$

(e^-2 + 2e^-32 + 2e^-162 + 4e^-512 + 5e^-1250)x = (1/4*sqrt(Pi/2) – 1/12 + 2/252 – 4/264 + 8/72)

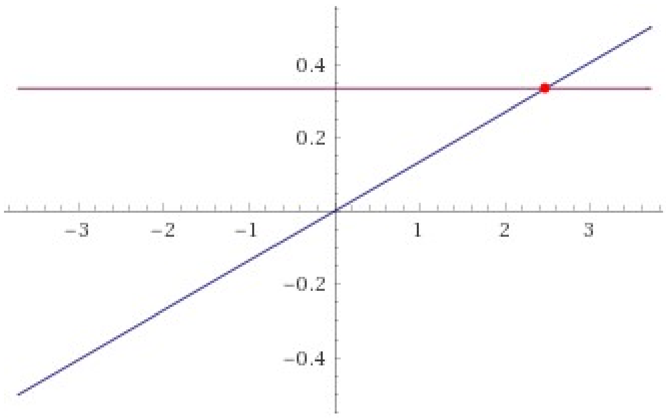
Input:

$$\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)x=\frac{1}{4}\sqrt{\frac{\pi}{2}}-\frac{1}{12}+\frac{2}{252}-\frac{4}{264}+\frac{8}{72}$$

Exact result:

$$\left(\frac{5}{e^{1250}}+\frac{4}{e^{512}}+\frac{2}{e^{162}}+\frac{2}{e^{32}}+\frac{1}{e^2}\right)x=\frac{19}{924}+\frac{\sqrt{\frac{\pi}{2}}}{4}$$

Plot:



$$\left(\frac{5}{e^{1250}}+\frac{4}{e^{512}}+\frac{2}{e^{162}}+\frac{2}{e^{32}}+\frac{1}{e^{2}}\right)x$$

$$\frac{19}{924}+\frac{\sqrt{\frac{\pi}{2}}}{4}$$

Alternate form:

$$\frac{x}{e^2}+\frac{2x}{e^{32}}+\frac{2x}{e^{162}}+\frac{4x}{e^{512}}+\frac{5x}{e^{1250}}-\frac{\sqrt{\frac{\pi}{2}}}{4}-\frac{19}{924}=0$$

Expanded form:

$$\frac{x}{e^2}+\frac{2x}{e^{32}}+\frac{2x}{e^{162}}+\frac{4x}{e^{512}}+\frac{5x}{e^{1250}}=\frac{19}{924}+\frac{\sqrt{\frac{\pi}{2}}}{4}$$

Alternate form assuming x>0:

$$\frac{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}{e^{1250}}=\frac{19}{924}+\frac{\sqrt{\frac{\pi}{2}}}{4}$$

Solution:

$x \approx 2.4671$

2.4671

(e^-2 + 2e^-32 + 2e^-162 + 4e^-512 + 5e^-1250)*((((e^1250 (38 + 231 sqrt(2 π)))/(1848 (5 + 4 e^738 + 2 e^1088 + 2 e^1218 + e^1248))))) = (1/4*sqrt(Pi/2) – 1/12 + 2/252 – 4/264 + 8/72)

Input:

$$\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)\times\frac{e^{1250}\left(38+231\sqrt{2\pi}\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}=$$
$$\frac{1}{4}\sqrt{\frac{\pi}{2}}-\frac{1}{12}+\frac{2}{252}-\frac{4}{264}+\frac{8}{72}$$

Result:

True

(e^-2 + 2e^-32 + 2e^-162 + 4e^-512 + 5e^-1250)*((((e^1250 (38 + 231 sqrt(2 π)))/(1848 (5 + 4 e^738 + 2 e^1088 + 2 e^1218 + e^1248)))))

Input:

$$\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)\times\frac{e^{1250}\left(38+231\sqrt{2\pi}\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}$$

Exact result:

$$\frac{\left(\frac{5}{e^{1250}}+\frac{4}{e^{512}}+\frac{2}{e^{162}}+\frac{2}{e^{32}}+\frac{1}{e^2}\right)e^{1250}\left(38+231\sqrt{2\pi}\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}$$

Decimal approximation:

0.333891304891645625572533431164151219396436113139012852349...

0.33389130489…

Property:

$$\frac{\left(\frac{5}{e^{1250}}+\frac{4}{e^{512}}+\frac{2}{e^{162}}+\frac{2}{e^{32}}+\frac{1}{e^2}\right)e^{1250}\left(38+231\sqrt{2\pi}\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}$$ is a transcendental number

Alternate forms:

$$\frac{38+231\sqrt{2\pi}}{1848}$$

$$\frac{19}{924}+\frac{\sqrt{\frac{\pi}{2}}}{4}$$

$$\frac{95}{924\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+\frac{19e^{738}}{231\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+$$
$$\frac{19e^{1088}}{462\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+$$
$$\frac{19e^{1218}}{462\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+$$
$$\frac{19e^{1248}}{924\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+\frac{5\sqrt{\frac{\pi}{2}}}{4\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+$$
$$\frac{e^{738}\sqrt{\frac{\pi}{2}}}{5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}}+\frac{e^{1088}\sqrt{\frac{\pi}{2}}}{2\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+$$
$$\frac{e^{1218}\sqrt{\frac{\pi}{2}}}{2\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}+\frac{e^{1248}\sqrt{\frac{\pi}{2}}}{4\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}$$

Series representations:

$$\frac{\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)\left(e^{1250}\left(38+231\sqrt{2\pi}\right)\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}=$$
$$\frac{19}{924}+\frac{1}{8}\sqrt{-1+2\pi}\sum_{k=0}^{\infty}(-1+2\pi)^{-k}\binom{\frac{1}{2}}{k}$$

$$\frac{\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)\left(e^{1250}\left(38+231\sqrt{2\pi}\right)\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}=$$
$$\frac{19}{924}+\frac{1}{8}\sqrt{-1+2\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+2\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$\frac{\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)\left(e^{1250}\left(38+231\sqrt{2\pi}\right)\right)}{1848\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}=$$
$$\frac{19}{924}+\frac{1}{8}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2\pi-z_0)^k z_0^{-k}}{k!}\quad\text{for not }\left(\left(z_0\in\mathbb{R}\text{ and }-\infty<z_0\leq 0\right)\right)$$

(((((e^-2 + 2e^-32 + 2e^-162 + 4e^-512 + 5e^-1250)*((((e^1250 (38 + 231 sqrt(2 π)))/(x* (5 + 4 e^738 + 2 e^1088 + 2 e^1218 + e^1248))))) = 0.33389130489))))

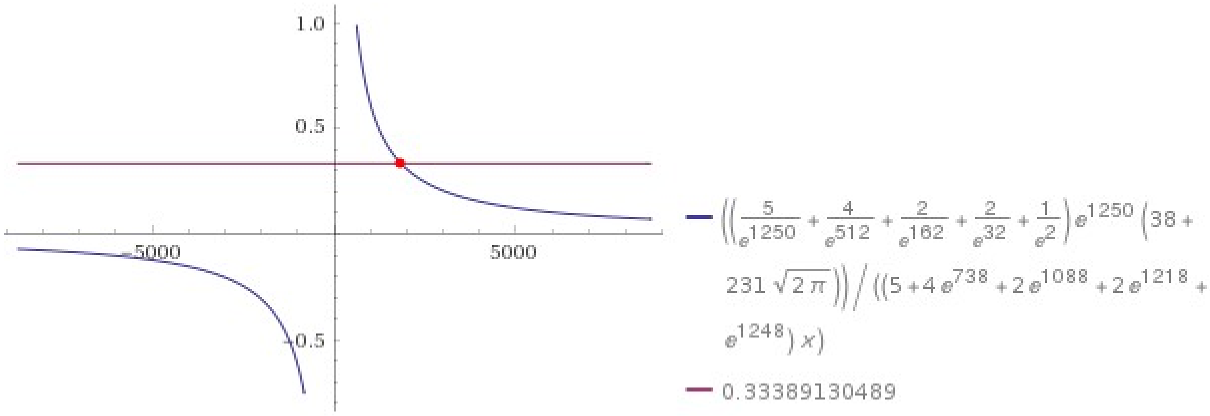
Input interpretation:

$$\left(\frac{1}{e^2}+\frac{2}{e^{32}}+\frac{2}{e^{162}}+\frac{4}{e^{512}}+\frac{5}{e^{1250}}\right)\times\frac{e^{1250}\left(38+231\sqrt{2\pi}\right)}{x\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)}=$$
0.33389130489

Result:

$$\frac{\left(\frac{5}{e^{1250}}+\frac{4}{e^{512}}+\frac{2}{e^{162}}+\frac{2}{e^{32}}+\frac{1}{e^2}\right)e^{1250}\left(38+231\sqrt{2\pi}\right)}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}=0.33389130489$$

Plot:



Alternate form:

$$\frac{38+231\sqrt{2\pi}}{x}=0.33389130489$$

Alternate form assuming x is positive:

$1.000000000\,x = 1848.000000$ (for $x \neq 0$)

Expanded form:

$$\frac{231e^{1248}\sqrt{2\pi}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{462e^{1218}\sqrt{2\pi}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{462e^{1088}\sqrt{2\pi}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{924e^{738}\sqrt{2\pi}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{1155\sqrt{2\pi}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{38e^{1248}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{76e^{1218}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{76e^{1088}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{152e^{738}}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}+\frac{190}{\left(5+4e^{738}+2e^{1088}+2e^{1218}+e^{1248}\right)x}=0.33389130489$$

Alternate forms assuming x is real:

$$\frac{231\sqrt{2\pi}}{x}+\frac{38}{x}=0.33389130489$$

$$\frac{1848.000000}{x}=1.000000000$$

Solution:

$x = 1848$

1848

1848+16+1/golden ratio

Input:

$$1848 + 16 + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{1}{\phi} + 1864$$

Decimal approximation:

1864.618033988749894848204586834365638117720309179805762862...

1864.61803398… result practically equal to the rest mass of D meson 1864.84

Alternate forms:

$$\frac{1}{2}\left(3727 + \sqrt{5}\right)$$

$$\frac{1864\,\phi + 1}{\phi}$$

$$\frac{\sqrt{5}}{2} + \frac{3727}{2}$$

Alternative representations:

$$1848 + 16 + \frac{1}{\phi} = 1864 + \frac{1}{2\sin(54\,°)}$$

$$1848 + 16 + \frac{1}{\phi} = 1864 + -\frac{1}{2\cos(216\,°)}$$

$$1848 + 16 + \frac{1}{\phi} = 1864 + -\frac{1}{2\sin(666\,°)}$$

Conclusion

In this paper, we highlight how from various Ramanujan mathematical functions, we obtain the particle masses of the Standard Model, the mass value of the candidate glueball, the scalar meson f_0 1710, some values of the entropies of the black holes and the value of the Cosmological Constant. This allows us to glimpse how Ramanujan's mathematics, further developed and deepened, can become the foundation of a theory that unifies various sectors of physics and cosmology only apparently distant from each other.

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