A new possible Theory of Mathematical Connections between some Ramanujan's equations and Approximations to π, the equations of Inflationary Cosmology concerning the scalar field ϕ, the Inflaton mass, the Higgs boson mass and the Pion meson $\pi^{\pm}$ mass

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Abstract

In this research thesis, we have described a new possible Theory of Mathematical Connections between some Ramanujan's equations and Approximations to π, the equations of Inflationary Cosmology concerning the scalar field ϕ, the Inflaton mass, the Higgs boson mass and the Pion meson $\pi^{\pm}$ *mass*

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https://www.britannica.com/biography/Srinivasa-Ramanujan
https://biografieonline.it/foto-enrico-fermi

Summary

In this research thesis, we have analyzed further Ramanujan formulas and described new mathematical connections with some sectors of Particle Physics. In the course of the discussion we describe and highlight the connections between some developments of Ramanujan equations utilizing the Lucas and/or Fibonacci numbers 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 some others baryons/mesons. Principally the 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.

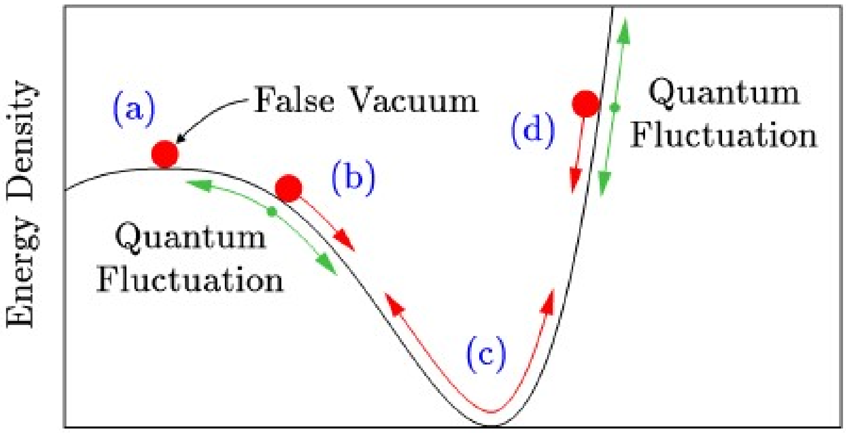
Is our opinion, that the possible connections between the mathematical developments of some Rogers-Ramanujan continued fractions, the value of the dilaton and that of "the dilaton mass calculated as a type of Higgs boson that is equal about to 125 GeV", the Higgs boson mass itself and the like-particle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

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

Proposal and discussion

We calculate the 4096th ($4096 = 64^2$) root of the value of scalar field and from it, we obtain 64

Inflationary Cosmology: Exploring the Universe from the Smallest to the Largest Scales



ϕ $\varphi = 50\ M_P = 1.2175 \times 10^{20}$ GeV

$$\sqrt[4096]{\frac{1}{1.2175 \times 10^{20}}} = 0.98877237\ldots$$

$$\sqrt{\log_{0.98877237}\left(\frac{1}{1.2175 \times 10^{20}}\right)} = 64.0000\ldots$$

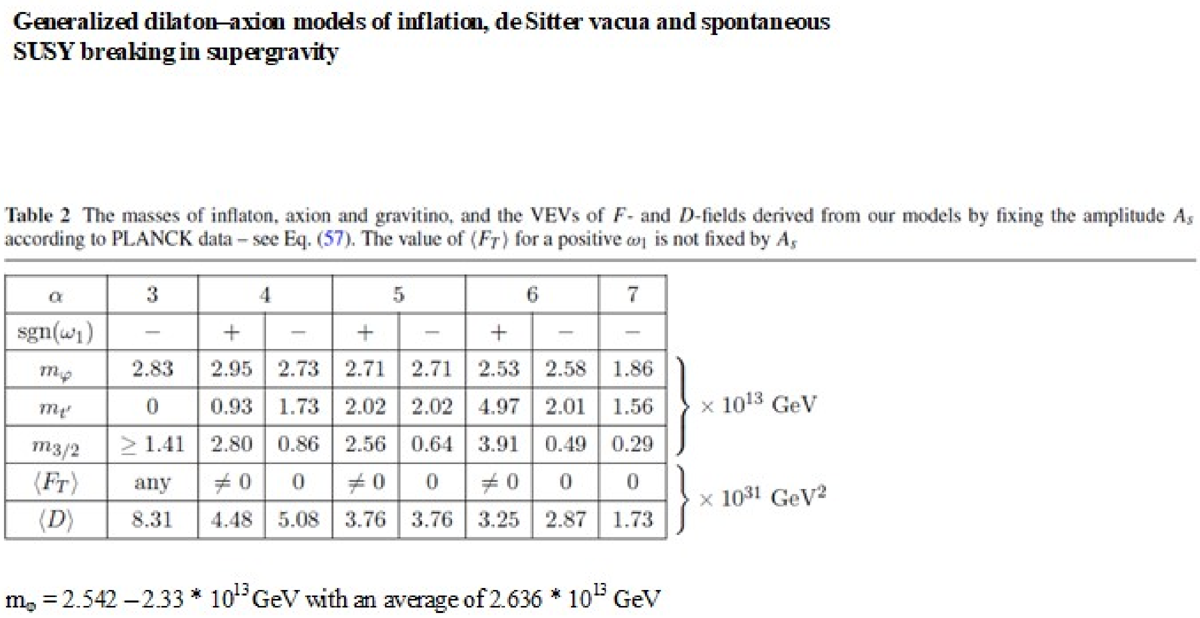
$$64^2 = 4096$$

where ϕ is the scalar field.

Thence, we obtain:

$$\sqrt[4096]{\frac{1}{\phi}} = 0.98877237\ ; \quad \sqrt{\log_{0.98877237}\left(\frac{1}{\phi}\right)} = 64\ ; \quad 64^2 = 4096$$

Now, we calculate the 4096th root of the value of inflaton mass and from it we obtain, also here, 64



Generalized dilaton–axion models of inflation, de Sitter vacua and spontaneous SUSY breaking in supergravity

Table 2 The masses of inflaton, axion and gravitino, and the VEVs of F- and D-fields derived from our models by fixing the amplitude A_s according to PLANCK data – see Eq. (57). The value of $\langle F_T \rangle$ for a positive ω_1 is not fixed by A_s

α	3	4		5		6		7	
$\mathrm{sgn}(\omega_1)$	$-$	$+$	$-$	$+$	$-$	$+$	$-$	$-$	
m_φ	2.83	2.95	2.73	2.71	2.71	2.53	2.58	1.86	$\times 10^{13}$ GeV
$m_{t'}$	0	0.93	1.73	2.02	2.02	4.97	2.01	1.56	
$m_{3/2}$	≥ 1.41	2.80	0.86	2.56	0.64	3.91	0.49	0.29	
$\langle F_T \rangle$	any	$\neq 0$	0	$\neq 0$	0	$\neq 0$	0	0	$\times 10^{31}$ GeV^2
$\langle D \rangle$	8.31	4.48	5.08	3.76	3.76	3.25	2.87	1.73	

$m_\varphi = 2.542 - 2.33 * 10^{13}$ GeV with an average of $2.636 * 10^{13}$ GeV

$$\sqrt[4096]{\frac{1}{2.83 \times 10^{13}}} = 0.992466536725379764\ldots$$

$$\sqrt{\log_{0.992466536}\left(\frac{1}{2.83 \times 10^{13}}\right)} = 64.0000\ldots$$

$$64^2 = 4096$$

where m_φ is the inflaton mass.

Thence we obtain:

$$\sqrt[4096]{\frac{1}{m_\varphi}} = 0.99246653\ ; \quad \sqrt{\log_{0.99246653}\left(\frac{1}{m_\varphi}\right)} = 64\ ; \quad 64^2 = 4096$$

We have the following mathematical connections:

$$\sqrt{\log_{0.98877237}\left(\frac{1}{1.2175\times10^{20}}\right)} = 64; \quad \sqrt{\log_{0.99246653}\left(\frac{1}{2.83\times10^{13}}\right)} = 64$$

$$\sqrt{\log_{0.98877237}\left(\frac{1}{1.2175\times10^{20}}\right)} = \sqrt{\log_{0.99246653}\left(\frac{1}{2.83\times10^{13}}\right)} = 64$$

From Ramanujan collected papers

$$g_{22} = \sqrt{(1+\sqrt{2})}.$$

Hence

$$\begin{aligned} 64g_{22}^{24} &= e^{\pi\sqrt{22}} - 24 + 276e^{-\pi\sqrt{22}} - \cdots, \\ 64g_{22}^{-24} &= \qquad\qquad\quad 4096e^{-\pi\sqrt{22}} + \cdots, \end{aligned}$$

so that

$$64(g_{22}^{24} + g_{22}^{-24}) = e^{\pi\sqrt{22}} - 24 + 4372e^{-\pi\sqrt{22}} + \cdots = 64\{(1+\sqrt{2})^{12} + (1-\sqrt{2})^{12}\}.$$

Hence

$$e^{\pi\sqrt{22}} = 2508951.9982\ldots.$$

Again

$$G_{37} = (6+\sqrt{37})^{\frac{1}{4}},$$

$$\begin{aligned} 64G_{37}^{24} &= e^{\pi\sqrt{37}} + 24 + 276e^{-\pi\sqrt{37}} + \cdots, \\ 64G_{37}^{-24} &= \qquad\qquad\quad 4096e^{-\pi\sqrt{37}} - \cdots, \end{aligned}$$

so that

$$64(G_{37}^{24} + G_{37}^{-24}) = e^{\pi\sqrt{37}} + 24 + 4372e^{-\pi\sqrt{37}} - \cdots = 64\{(6+\sqrt{37})^{6} + (6-\sqrt{37})^{6}\}.$$

Hence

$$e^{\pi\sqrt{37}} = 199148647.999978\ldots.$$

Similarly, from

$$g_{58} = \sqrt{\left(\frac{5+\sqrt{29}}{2}\right)},$$

we obtain

$$64(g_{58}^{24} + g_{58}^{-24}) = e^{\pi\sqrt{58}} - 24 + 4372e^{-\pi\sqrt{58}} + \cdots = 64\left\{\left(\frac{5+\sqrt{29}}{2}\right)^{12} + \left(\frac{5-\sqrt{29}}{2}\right)^{12}\right\}.$$

Hence

$$e^{\pi\sqrt{58}} = 24591257751.99999982\ldots.$$

From the following expression (see above part of paper), we obtain:

$$e^{\pi\sqrt{37}} + 24 + 4372e^{-\pi\sqrt{37}} - \cdots = 64\{(6+\sqrt{37})^6 + (6-\sqrt{37})^6\}.$$

(((exp(Pi*sqrt37)+24+(4096+276)exp-(Pi*sqrt37))) / ((((6+sqrt37)^6+(6- sqrt37)^6)))

$$\frac{\exp(\pi\sqrt{37}) + 24 + (4096+276)\exp(-(\pi\sqrt{37}))}{(6+\sqrt{37})^6 + (6-\sqrt{37})^6} = \frac{24 + 4372\, e^{-\sqrt{37}\,\pi} + e^{\sqrt{37}\,\pi}}{(6-\sqrt{37})^6 + (6+\sqrt{37})^6} =$$

$$= \frac{24 + 4372\, e^{-\sqrt{37}\,\pi} + e^{\sqrt{37}\,\pi}}{(6-\sqrt{37})^6 + (6+\sqrt{37})^6} \text{ is a transcendental number } =$$

$$= 64.00000000000000000077996590154140877656204274015527898430\ldots \sim 64$$

From which:

(((exp(Pi*sqrt37)+24+(x+276)exp-(Pi*sqrt37)))/((((6+sqrt37)^6+(6-sqrt37)^6))) = 64

$$\frac{\exp(\pi\sqrt{37}) + 24 + (x+276)\exp(-(\pi\sqrt{37}))}{(6+\sqrt{37})^6 + (6-\sqrt{37})^6} = 64$$

Exact result:

$$\frac{e^{-\sqrt{37}\,\pi}(x+276) + e^{\sqrt{37}\,\pi} + 24}{(6-\sqrt{37})^6 + (6+\sqrt{37})^6} = 64$$

Alternate forms:

$$\frac{e^{-\sqrt{37}\,\pi}\,(x+276)}{3\,111\,698}+\frac{e^{\sqrt{37}\,\pi}}{3\,111\,698}+\frac{12}{1\,555\,849}=64$$

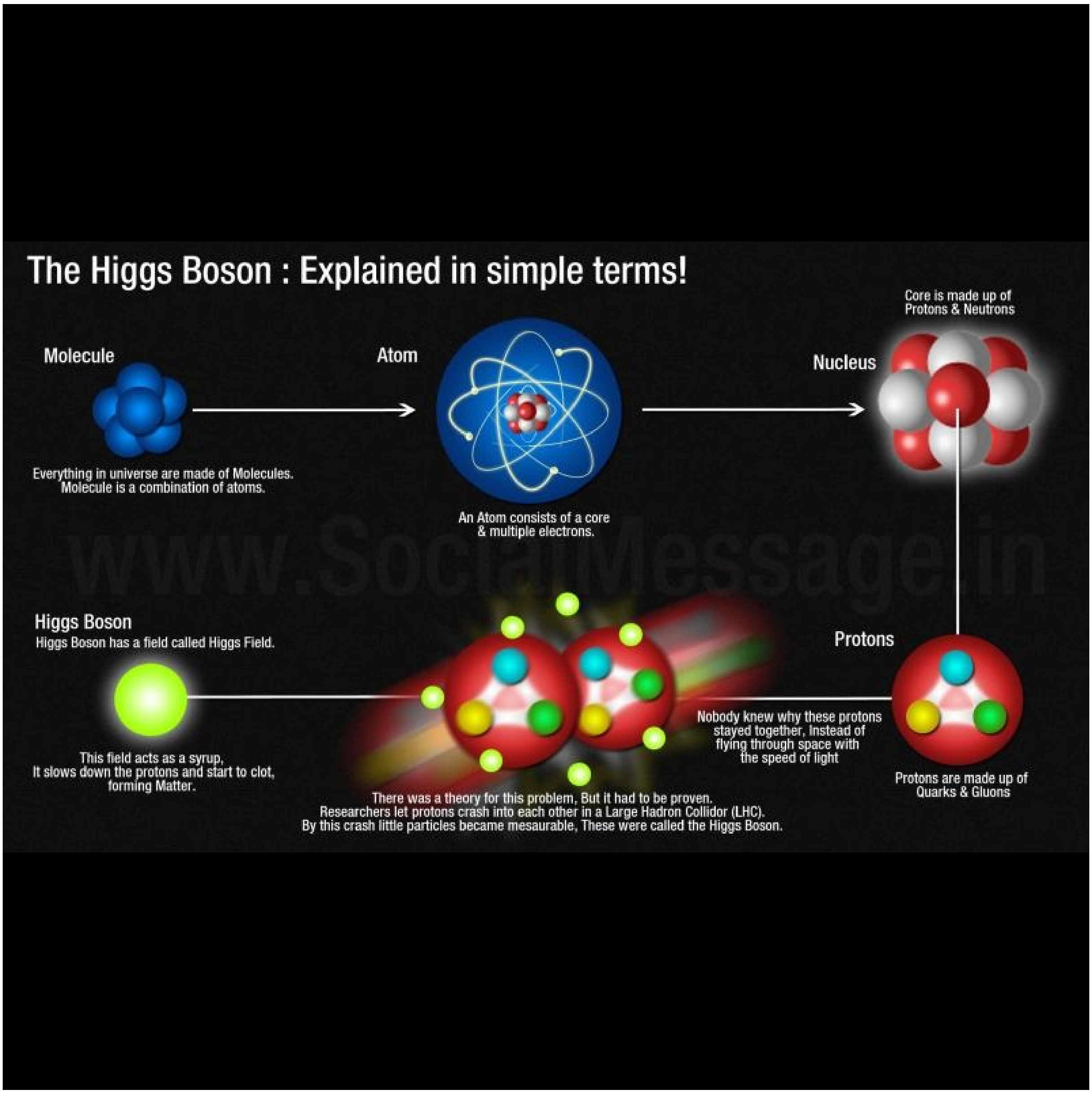
$$\frac{e^{-\sqrt{37}\,\pi}\left(x+e^{2\sqrt{37}\,\pi}+24\,e^{\sqrt{37}\,\pi}+276\right)}{3\,111\,698}=64$$

$$\frac{e^{-\sqrt{37}\,\pi}\,x}{(6-\sqrt{37})^6+(6+\sqrt{37})^6}+\frac{e^{\sqrt{37}\,\pi}}{(6-\sqrt{37})^6+(6+\sqrt{37})^6}+\frac{276\,e^{-\sqrt{37}\,\pi}}{(6-\sqrt{37})^6+(6+\sqrt{37})^6}+\frac{24}{(6-\sqrt{37})^6+(6+\sqrt{37})^6}-64=0$$

$$x=-276+199\,148\,648\,e^{\sqrt{37}\,\pi}-e^{2\sqrt{37}\,\pi}$$

$$x\approx 4096.0$$

Higgs Boson



Everything in universe are made of Molecules. Molecule is a combination of atoms.

An Atom consists of a core & multiple electrons.

Higgs Boson has a field called Higgs Field.

This field acts as a syrup, It slows down the protons and start to clot, forming Matter.

Nobody knew why these protons stayed together, Instead of flying through space with the speed of light

Protons are made up of Quarks & Gluons

There was a theory for this problem, But it had to be proven. Researchers let protons crash into each other in a Large Hadron Collidor (LHC). By this crash little particles became mesaurable, These were called the Higgs Boson.

http://therealmrscience.net/exactly-what-does-the-higgs-boson-do.html

From the above values of scalar field ϕ, and of the inflaton mass m_φ , we obtain results that are in the range of the Higgs boson mass:

$$2\sqrt{\log_{0.98877237}\left(\frac{1}{1.2175\times10^{20}}\right)}-\pi+\frac{1}{\phi}$$

125.476...

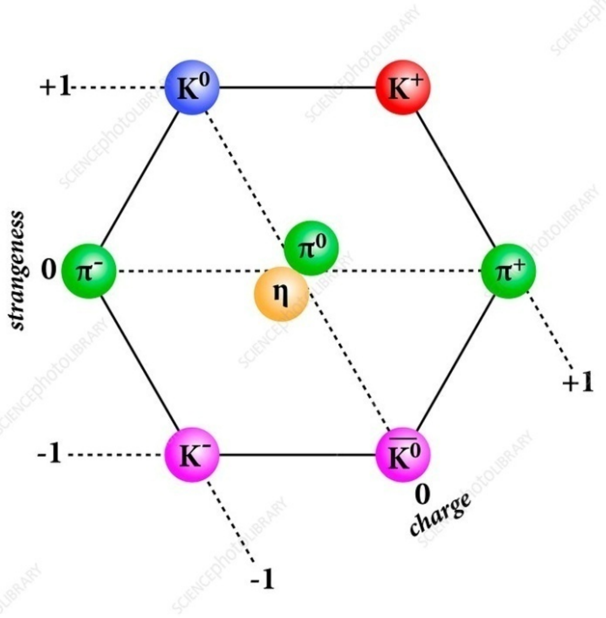
and

$$2\sqrt{\log_{0.99246653}\left(\frac{1}{2.83\times10^{13}}\right)}-\pi+\frac{1}{\phi}$$

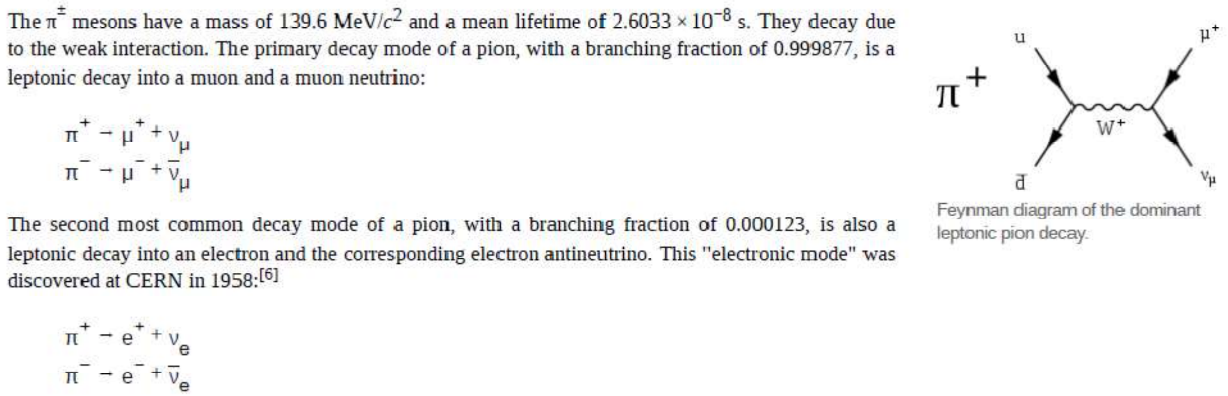
125.476...

Pion mesons

https://www.sciencephoto.com/media/476068/view/meson-octet-diagram



Meson octet. Diagram organising mesons into an octet according to their charge and strangeness. Particles along the same diagonal line share the same charge; positive (+1), neutral (0), or negative (-1). Particles along the same horizontal line share the same strangeness. Strangeness is a quantum property that is conserved in strong and electromagnetic interactions, between particles, but not in weak interactions. Mesons are made up of one quark and one antiquark. Particles with a strangeness of +1, such as the kaons (blue and red) in the top line, contain one strange antiquark. Particles with a strangeness of 0, such as the pion mesons (green) and eta meson (yellow) in the middle line, contain no strange quarks. Particles with a strangeness of -1, such as the antiparticle kaons (pink) in the bottom line, contain one strange quark



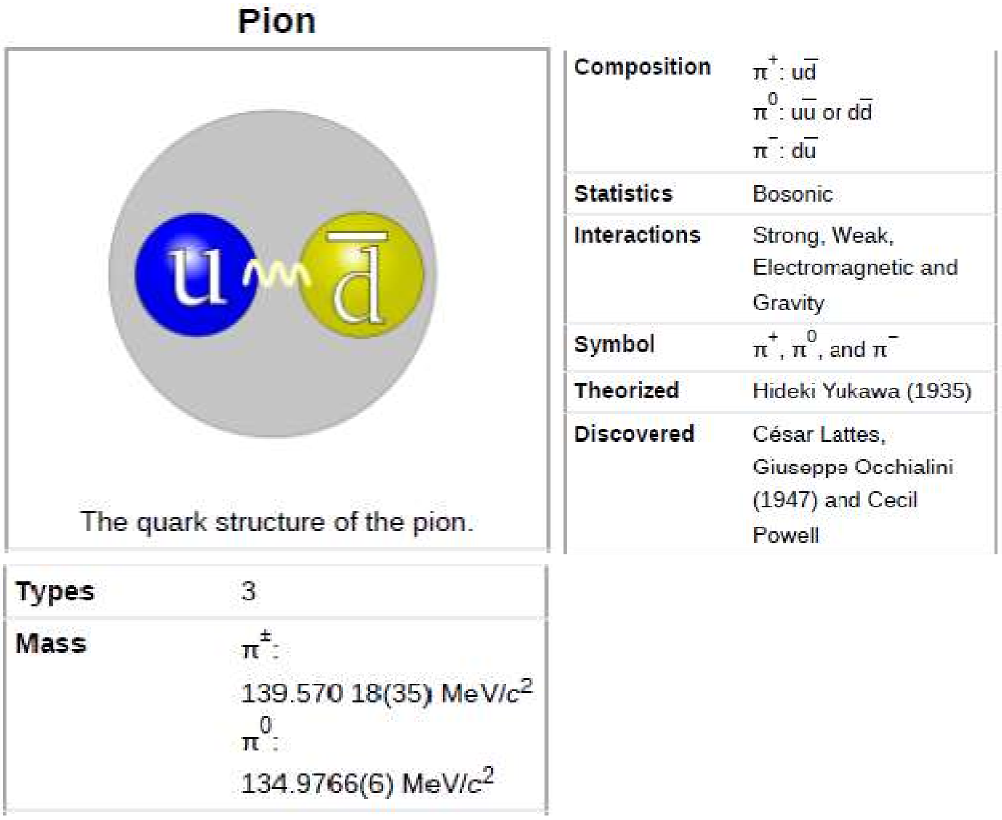
The $\pi^\pm$ mesons have a mass of 139.6 MeV/c^2 and a mean lifetime of 2.6033×10^{-8} s. They decay due to the weak interaction. The primary decay mode of a pion, with a branching fraction of 0.999877, is a leptonic decay into a muon and a muon neutrino:

$$\pi^+ - \mu^+ + \nu_\mu$$
$$\pi^- - \mu^- + \bar{\nu}_\mu$$

The second most common decay mode of a pion, with a branching fraction of 0.000123, is also a leptonic decay into an electron and the corresponding electron antineutrino. This "electronic mode" was discovered at CERN in 1958:[6]

$$\pi^+ - e^+ + \nu_e$$
$$\pi^- - e^- + \bar{\nu}_e$$

Feynman diagram of the dominant leptonic pion decay.



Pion

The quark structure of the pion.

Composition	π^+: $u\bar{d}$ π^0: $u\bar{u}$ or $d\bar{d}$ π^-: $d\bar{u}$
Statistics	Bosonic
Interactions	Strong, Weak, Electromagnetic and Gravity
Symbol	π^+, π^0, and π^-
Theorized	Hideki Yukawa (1935)
Discovered	César Lattes, Giuseppe Occhialini (1947) and Cecil Powell
Types	3
Mass	$\pi^\pm$: 139.570 18(35) MeV/c^2 π^0: 134.9766(6) MeV/c^2

From the above values of scalar field ϕ, and the inflaton mass m_φ , we obtain also the value of Pion meson $\pi^{\pm}$ = 139.57018 MeV/c^2

$$\sqrt[2]{\log_{0.98877237}\left(\frac{1}{1.2175\times 10^{20}}\right)}+11+\frac{1}{\phi}$$

139.618...

and

$$\sqrt[2]{\log_{0.99246653}\left(\frac{1}{2.83\times 10^{13}}\right)}+11+\frac{1}{\phi}$$

139.618...

The $\pi^{\pm}$ mesons have a mass of 139.6 MeV/$c2$ and a mean lifetime of 2.6033×10^{-8} s. They decay due to the weak interaction. The primary decay mode of a pion, with a branching fraction of 0.999877, is a leptonic decay into a muon and a muon neutrino.

Note that the value 0.999877 is very closed to the following Rogers-Ramanujan continued fraction (http://www.bitman.name/math/article/102/109/):

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

We observe that also the results of 4096th root of the values of scalar field ϕ, and the inflaton mass m_φ:

$$\sqrt[4096]{\frac{1}{\phi}} = 0.98877237\ ; \qquad \sqrt[4096]{\frac{1}{m_{\varphi}}} = 0.99246653$$

are very closed to the above continued fraction.

Furthermore, from the results concerning the scalar field ϕ (0.98877237, 1.2175e+20), and the inflaton mass m_{φ} (0.99246653, 2.83e+13), we obtain, performing the 10th root:

((((2sqrt (((log base 0.98877237 ((1/1.2175e+20)))))-Pi))))^1/10

Input interpretation:

$$\sqrt[10]{2\sqrt{\log_{0.98877237}\left(\frac{1}{1.2175\times 10^{20}}\right)-\pi}}$$

Result:

1.620472942364990195996419034511458317811826267744760835367...

1.620472942…

And:

1/10^27 [(47+4)/10^3+((((2sqrt (((log base 0.98877237 ((1/1.2175e+20)))))-Pi))))^1/10]

where 47 and 4 are Lucas numbers

$$\frac{1}{10^{27}}\left(\frac{47+4}{10^{3}}+\sqrt[10]{2\sqrt{\log_{0.98877237}\left(\frac{1}{1.2175\times 10^{20}}\right)-\pi}}\right)$$

Result:

$1.671473... \times 10^{-27}$

$1.671473\ldots{}^*10^{-27}$ result practically equal to the proton mass

We have also:

((((2sqrt (((log base 0.99246653 ((1/2.83e+13)))))-Pi))))^1/10

$$\sqrt[10]{2\sqrt{\log_{0.99246653}\left(\frac{1}{2.83\times 10^{13}}\right)}-\pi}$$

Result:

1.620472850161415439289586204886587162444405282709701447326...

1.62047285…

And:

1/10^27 [(47+4)/10^3+((((2sqrt (((log base 0.99246653 ((1/2.83e+13)))))-Pi))))^1/10]

$$\frac{1}{10^{27}}\left(\frac{47+4}{10^3}+\sqrt[10]{2\sqrt{\log_{0.99246653}\left(\frac{1}{2.83\times 10^{13}}\right)}-\pi}\right)$$

Result:

$1.671473\ldots\times 10^{-27}$

$1.671473\ldots{}^*10^{-27}$ result that is practically equal to the proton mass as the previous

Trascendental numbers

From the paper of S. Ramanujan “*Modular equations and approximations to π*”

We have the following expression:

$$\frac{3}{\pi} = 1 - 24\left(\frac{1}{e^{2\pi}-1} + \frac{2}{e^{4\pi}-1} + \frac{3}{e^{6\pi}-1} + \cdots\right)$$

1-24[(1/(e^(2Pi)-1)) + (2/(e^(4Pi)-1)) + (3/(e^(6Pi)-1))]

$$1 - 24\left(\frac{1}{e^{2\pi}-1} + \frac{2}{e^{4\pi}-1} + \frac{3}{e^{6\pi}-1}\right)$$

Decimal approximation:

0.954929659721612900604724361833045671977574376370221277342...

0.954929659….

Property:

$1 - 24\left(\frac{1}{-1+e^{2\pi}} + \frac{2}{-1+e^{4\pi}} + \frac{3}{-1+e^{6\pi}}\right)$ is a transcendental number

Series representations:

$$1 - 24\left(\frac{1}{e^{2\pi}-1} + \frac{2}{e^{4\pi}-1} + \frac{3}{e^{6\pi}-1}\right) = 1 - \frac{24}{-1 + e^{8\sum_{k=0}^{\infty} (-1)^k/(1+2k)}} - \frac{48}{-1 + e^{16\sum_{k=0}^{\infty} (-1)^k/(1+2k)}} - \frac{72}{-1 + e^{24\sum_{k=0}^{\infty} (-1)^k/(1+2k)}}$$

$$1 - 24\left(\frac{1}{e^{2\pi}-1} + \frac{2}{e^{4\pi}-1} + \frac{3}{e^{6\pi}-1}\right) = 1 - \frac{24}{-1 + \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{8\sum_{k=0}^{\infty} (-1)^k/(1+2k)}} - \frac{48}{-1 + \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{16\sum_{k=0}^{\infty} (-1)^k/(1+2k)}} - \frac{72}{-1 + \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{24\sum_{k=0}^{\infty} (-1)^k/(1+2k)}}$$

$$1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)=1-\frac{24}{-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}-\frac{48}{-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}-\frac{72}{-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{24\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}$$

Integral representations:

$$1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)=1-\frac{24}{-1+e^{4\int_0^{\infty}1/(1+t^2)\,dt}}-\frac{48}{-1+e^{8\int_0^{\infty}1/(1+t^2)\,dt}}-\frac{72}{-1+e^{12\int_0^{\infty}1/(1+t^2)\,dt}}$$

$$1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)=1-\frac{24}{-1+e^{4\int_0^{\infty}\sin(t)/t\,dt}}-\frac{48}{-1+e^{8\int_0^{\infty}\sin(t)/t\,dt}}-\frac{72}{-1+e^{12\int_0^{\infty}\sin(t)/t\,dt}}$$

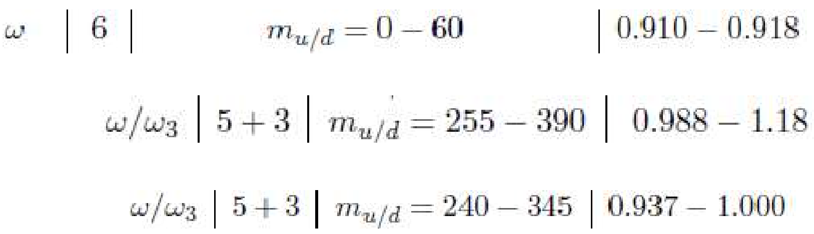
$$1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)=1-\frac{24}{-1+e^{8\int_0^{1}\sqrt{1-t^2}\,dt}}-\frac{48}{-1+e^{16\int_0^{1}\sqrt{1-t^2}\,dt}}-\frac{72}{-1+e^{24\int_0^{1}\sqrt{1-t^2}\,dt}}$$

Note that the value of the following Rogers-Ramanujan continued fraction is practically equal to the result of the previous expression. Indeed:

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

$$\cong \left(1 - 24 \left(\frac{1}{e^{2\pi} - 1} + \frac{2}{e^{4\pi} - 1} + \frac{3}{e^{6\pi} - 1} \right) \right) = 0.954929659\ldots$$

We know that:



ω	6	$m_{u/d} = 0 - 60$	0.910 – 0.918
ω/ω_3	$5+3$	$m_{u/d} = 255 - 390$	0.988 – 1.18
ω/ω_3	$5+3$	$m_{u/d} = 240 - 345$	0.937 – 1.000

that are the various Regge slope of Omega mesons

From the paper:

Generalized dilaton–axion models of inflation, de Sitter vacua and spontaneous SUSY breaking in supergravity

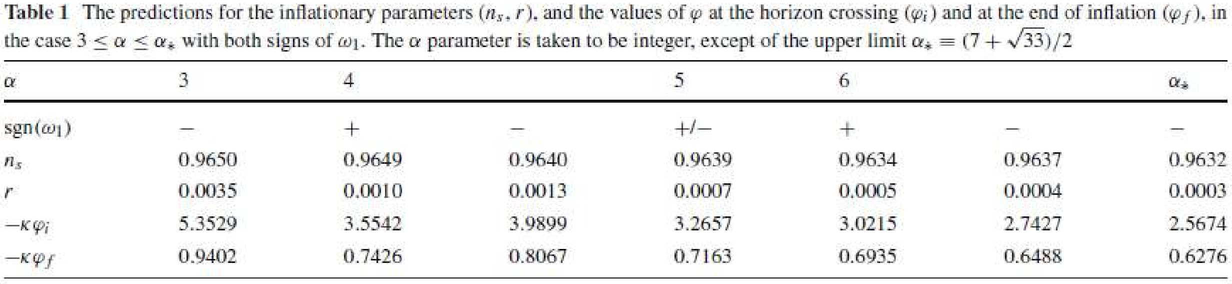


Table 1 The predictions for the inflationary parameters (n_s, r), and the values of φ at the horizon crossing (φ_i) and at the end of inflation (φ_f), in the case $3 \le \alpha \le \alpha_*$ with both signs of ω_1. The α parameter is taken to be integer, except of the upper limit $\alpha_* \equiv (7 + \sqrt{33})/2$

α	3	4		5	6		α_*
sgn(ω_1)	–	+	–	+/–	+	–	–
n_s	0.9650	0.9649	0.9640	0.9639	0.9634	0.9637	0.9632
r	0.0035	0.0010	0.0013	0.0007	0.0005	0.0004	0.0003
$-\kappa\varphi_i$	5.3529	3.5542	3.9899	3.2657	3.0215	2.7427	2.5674
$-\kappa\varphi_f$	0.9402	0.7426	0.8067	0.7163	0.6935	0.6488	0.6276

We note that the value of inflationary parameter n_s (spectral index) for $\alpha = 3$ is equal to 0.9650 and that the range of Regge slope of the following Omega meson is:

ω/ω_3 | $5+3$ | $m_{u/d} = 240 - 345$ | 0.937 – 1.000

the values 0.954929659... and 0.9568666373 are very near to the above Regge slope, to the spectral index n_s and to the dilaton value 0.989117352243 = ϕ

We observe that 0.954929659 has the following property:

$$1-24\left(\frac{1}{-1+e^{2\pi}}+\frac{2}{-1+e^{4\pi}}+\frac{3}{-1+e^{6\pi}}\right) \text{ is a transcendental number}$$

= 0.9549296597216129 the result is a transcendental number

We have also that, performing the 128th root, we obtain:

((((1-24[(1/(e^(2Pi)-1)) + (2/(e^(4Pi)-1)) + (3/(e^(6Pi)-1))]))))^1/128

Input:

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)}$$

Decimal approximation:

0.999639771179582593534832998563472389939029398477483191618...

0.9996397711… is also a transcendental number

This result is connected to the primary decay mode of a pion, with a branching fraction of 0.999877, that is a leptonic decay into a muon and a muon neutrino.

Property:

$$\sqrt[128]{1-24\left(\frac{1}{-1+e^{2\pi}}+\frac{2}{-1+e^{4\pi}}+\frac{3}{-1+e^{6\pi}}\right)} \text{ is a transcendental number}$$

Series representations:

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)} = \left(1-24\left(\frac{1}{-1+e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}+\frac{2}{-1+e^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}+\frac{3}{-1+e^{24\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}\right)\right){}^\wedge(1/128)$$

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)} = \sqrt[128]{1-24\left(\frac{1}{-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{2\pi}}+\frac{2}{-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{4\pi}}+\frac{3}{-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6\pi}}\right)}$$

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)} = \sqrt[128]{1-24\left(\frac{1}{-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{2\pi}}+\frac{2}{-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{4\pi}}+\frac{3}{-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{6\pi}}\right)}$$

Integral representations:

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)} = \sqrt[128]{1-24\left(\frac{1}{-1+e^{4\int_0^{\infty}1/(1+t^2)\,dt}}+\frac{2}{-1+e^{8\int_0^{\infty}1/(1+t^2)\,dt}}+\frac{3}{-1+e^{12\int_0^{\infty}1/(1+t^2)\,dt}}\right)}$$

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)} = \sqrt[128]{1-24\left(\frac{1}{-1+e^{4\int_0^{\infty}\sin(t)/t\,dt}}+\frac{2}{-1+e^{8\int_0^{\infty}\sin(t)/t\,dt}}+\frac{3}{-1+e^{12\int_0^{\infty}\sin(t)/t\,dt}}\right)}$$

$$\sqrt[128]{1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)} =$$

$$\sqrt[128]{1-24\left(\frac{1}{-1+e^{8\int_0^1\sqrt{1-t^2}\,dt}}+\frac{2}{-1+e^{16\int_0^1\sqrt{1-t^2}\,dt}}+\frac{3}{-1+e^{24\int_0^1\sqrt{1-t^2}\,dt}}\right)}$$

Performing:

log base 0.999639771179((((1-24[(1/(e^(2Pi)-1)) + (2/(e^(4Pi)-1)) + (3/(e^(6Pi)-1))]))))-Pi+1/golden ratio

we obtain:

Input interpretation:

$$\log_{0.999639771179}\left(1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476441...

125.476441…. 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

Series representations:

$$\log_{0.9996397711790000}\left(1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)\right)-\pi+\frac{1}{\phi} =$$

$$\frac{1}{\phi}-\pi-\frac{\sum_{k=1}^{\infty}\frac{(-24)^k\left(\frac{1}{1-e^{2\pi}}-\frac{2}{-1+e^{4\pi}}-\frac{3}{-1+e^{6\pi}}\right)^k}{k}}{\log(0.9996397711790000)}$$

$$\log_{0.9996397711790000}\left(1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1.000000000000}{\phi}-1.000000000000\,\pi+$$
$$\log\left(1-24\left(\frac{1}{-1+e^{2\pi}}+\frac{2}{-1+e^{4\pi}}+\frac{3}{-1+e^{6\pi}}\right)\right)$$
$$\left(-2775.513305165-1.000000000000\sum_{k=0}^{\infty}(-0.0003602288210000)^k\,G(k)\right)$$
$$\text{for }\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2\,(1+k)\,(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

And:

log base 0.999639771179((((1-24[(1/(e^(2Pi)-1)) + (2/(e^(4Pi)-1)) + (3/(e^(6Pi)-1))]))))+11+1/golden ratio

where 11 is a Lucas number

Input interpretation:

$$\log_{0.999639771179}\left(1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618034...

139.618034…. result practically equal to the rest mass of Pion meson 139.57

Series representations:

$$\log_{0.9996397711790000}\left(1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-\frac{\sum_{k=1}^{\infty}\frac{(-24)^k\left(\frac{1}{1-e^{2\pi}}-\frac{2}{-1+e^{4\pi}}-\frac{3}{-1+e^{6\pi}}\right)^k}{k}}{\log(0.9996397711790000)}$$

$$\log_{0.999639771179000}\left(1-24\left(\frac{1}{e^{2\pi}-1}+\frac{2}{e^{4\pi}-1}+\frac{3}{e^{6\pi}-1}\right)\right)+11+\frac{1}{\phi}=$$

$$11.00000000000+\frac{1.000000000000}{\phi}+$$

$$\log\left(1-24\left(\frac{1}{-1+e^{2\pi}}+\frac{2}{-1+e^{4\pi}}+\frac{3}{-1+e^{6\pi}}\right)\right)$$

$$\left(-2775.513305165-1.000000000000\sum_{k=0}^{\infty}(-0.000360228821000)^{k}\,G(k)\right)$$

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

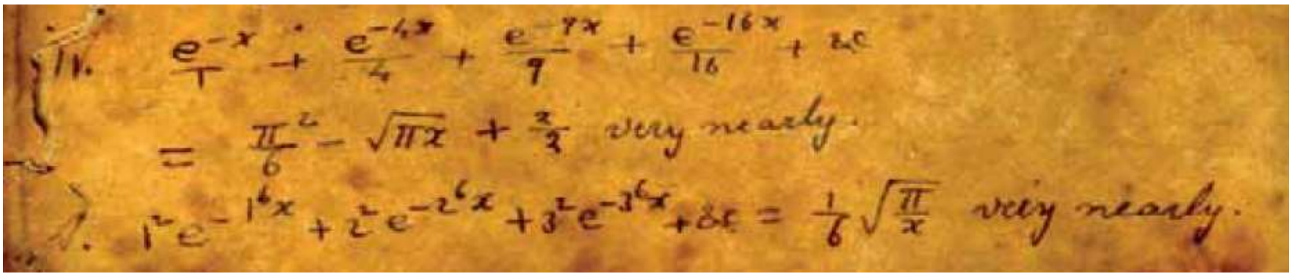
In conclusion, we have shown in this proposal a possible theoretical connection between some parameters of inflationary cosmology, of particle masses (Higgs boson and Pion meson $\pi\pm$) and some fundamental equations of Ramanujan’s mathematics.

Further, we note that π, ϕ, 1/ϕ and 11, that is a Lucas number (often in developing Ramanujan's equations we use Fibonacci and Lucas numbers), play a fundamental role in the development, and therefore, in the final results of Ramanujan's equations. This fact can be explained by admitting that π, ϕ, 1/ϕ and 11, and other numbers connected with Fibonacci and Lucas sequences, are not only mathematical constants and / or simple numbers, but "data", which inserted in the right place, and in the most various possible and always logical combinations, lead precisely to the solutions discussed so far: masses of particles, as described in the following paper and other physical and cosmological parameters.

From:

MANUSCRIPT BOOK 2 OF SRINIVASA RAMANUJAN

Pages 185-186



11. $\frac{e^{-x}}{1}+\frac{e^{-4x}}{4}+\frac{e^{-9x}}{9}+\frac{e^{-16x}}{16}+\&c$

$=\frac{\pi^2}{6}-\sqrt{\pi x}+\frac{x}{2}$ very nearly.

12. $1^2e^{-1^6x}+2^2e^{-2^6x}+3^2e^{-3^6x}+\&c=\frac{1}{6}\sqrt{\frac{\pi}{x}}$ very nearly.

For x = 2, we obtain:

e^(-2)/1 + e^(-8)/4 + e^(-18)/9 + e^(-32)/16

Input:

$$\frac{1}{e^2} + \frac{1}{e^8 \times 4} + \frac{1}{e^{18} \times 9} + \frac{1}{e^{32} \times 16}$$

Decimal approximation:

0.135419150585809082998788153543982228554239225669845771435...

0.1354191505858090829987….

Property:

$$\frac{1}{16\,e^{32}} + \frac{1}{9\,e^{18}} + \frac{1}{4\,e^8} + \frac{1}{e^2} \text{ is a transcendental number}$$

Alternate form:

$$\frac{144\,e^{30} + 36\,e^{24} + 16\,e^{14} + 9}{144\,e^{32}}$$

Alternative representation:

$$\frac{1}{e^2} + \frac{1}{e^8\,4} + \frac{1}{e^{18}\,9} + \frac{1}{e^{32}\,16} = \frac{1}{\exp^2(z)} + \frac{1}{\exp^8(z)\,4} + \frac{1}{\exp^{18}(z)\,9} + \frac{1}{\exp^{32}(z)\,16} \quad \text{for } z = 1$$

Pi^2/6 - sqrt(2Pi)+2/2

Input:

$$\frac{\pi^2}{6} - \sqrt{2\,\pi} + \frac{2}{2}$$

Exact result:

$$1 + \frac{\pi^2}{6} - \sqrt{2\,\pi}$$

Decimal approximation:

0.138305792217225934056649881834979936211963160596860121105...

0.1383057922172….

Alternate form:

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

Series representations:

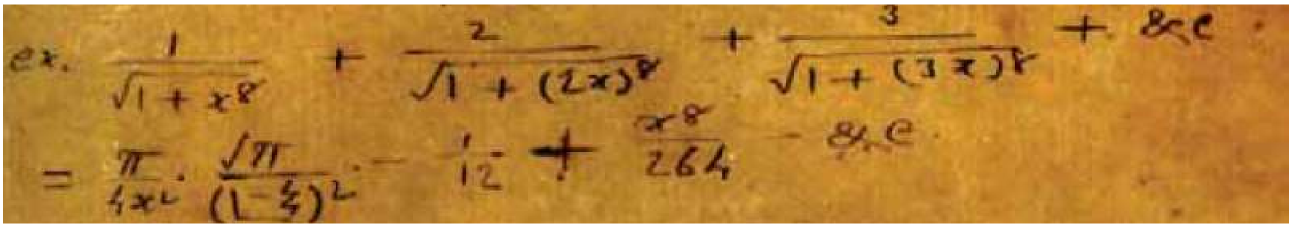
$$\frac{\pi^2}{6}-\sqrt{2\pi}+\frac{2}{2}=1+\frac{\pi^2}{6}-\sqrt{-1+2\pi}\sum_{k=0}^{\infty}(-1+2\pi)^{-k}\binom{\frac{1}{2}}{k}$$

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

$$\frac{\pi^2}{6}-\sqrt{2\pi}+\frac{2}{2}=1+\frac{\pi^2}{6}-\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2\pi-z_0)^k z_0^{-k}}{k!}$$

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

We have that:



$$\text{ex. }\frac{1}{\sqrt{1+x^8}}+\frac{2}{\sqrt{1+(2x)^8}}+\frac{3}{\sqrt{1+(3x)^8}}+\&c$$
$$=\frac{\pi}{4x^2}\cdot\frac{\sqrt{\pi}}{\left(\lfloor\underline{-\tfrac{3}{4}}\right)^2}-\frac{1}{12}+\frac{x^8}{264}-\&c$$

1/(sqrt(1+2^8))+2/(sqrt(1+4^8))+3/(sqrt(1+6^8))

Input:

$$\frac{1}{\sqrt{1+2^8}}+\frac{2}{\sqrt{1+4^8}}+\frac{3}{\sqrt{1+6^8}}$$

Result:

$$\frac{1}{\sqrt{257}}+\frac{2}{\sqrt{65537}}+\frac{3}{\sqrt{1679617}}$$

Decimal approximation:

0.0725055406769425069738661787498790829751115359703918768 76...

0.0725055406769425….

Alternate forms:

$$\frac{\sqrt{257}}{257}+\frac{2\sqrt{65\,537}}{65\,537}+\frac{3\sqrt{1\,679\,617}}{1\,679\,617}$$

$$\frac{110\,077\,059\,329\sqrt{257}+863\,323\,138\sqrt{65\,537}+50\,529\,027\sqrt{1\,679\,617}}{28\,289\,804\,247\,553}$$

$$\frac{3}{\sqrt{1\,679\,617}}+\frac{65\,537\sqrt{257}+514\sqrt{65\,537}}{16\,843\,009}$$

-(((Pi/16 * sqrt(Pi)/(((0.602439i))^2)) - 1/12 + 2^8/264))

Input interpretation:

$$-\left(\frac{\pi}{16}\times\frac{\sqrt{\pi}}{(0.602439\,i)^2}-\frac{1}{12}+\frac{2^8}{264}\right)$$

i is the imaginary unit

Result:

0.0725482…

0.0725482…

Series representations:

$$-\left(\frac{\sqrt{\pi}\,\pi}{(0.602439\,i)^2\,16}-\frac{1}{12}+\frac{2^8}{264}\right)=$$
$$-0.886364-\frac{0.172208\,\pi\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}}{i^2}$$

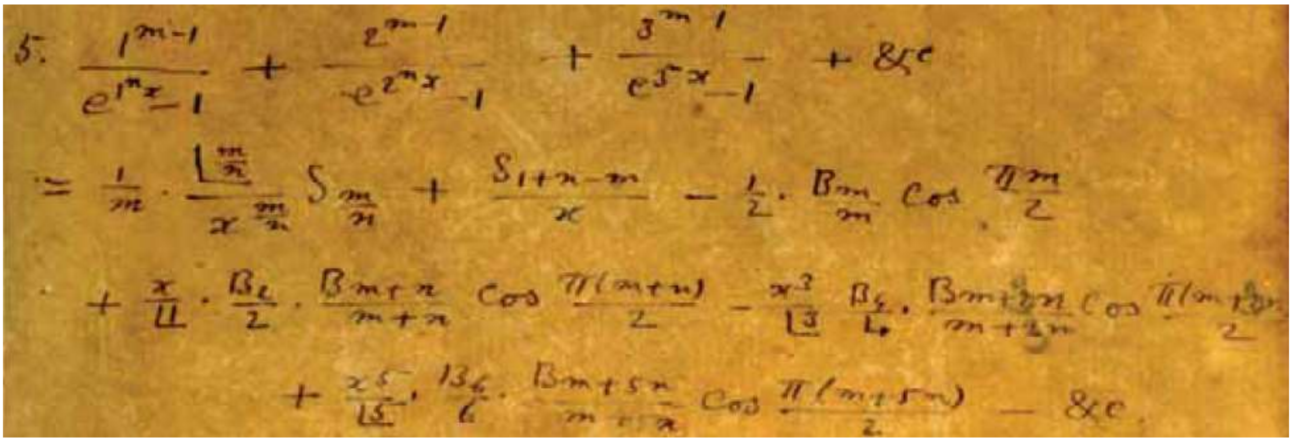
$$-\left(\frac{\sqrt{\pi}\,\pi}{(0.602439\,i)^2\,16}-\frac{1}{12}+\frac{2^8}{264}\right)=$$
$$-0.886364-\frac{0.172208\,\pi\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}{i^2}$$

$$-\left(\frac{\sqrt{\pi}\,\pi}{(0.602439\,i)^2\,16}-\frac{1}{12}+\frac{2^8}{264}\right)=$$

$$-0.886364-\frac{0.172208\,\pi\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\pi-z_0)^k z_0^{-k}}{k!}}{i^2}$$

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

We have that:



$$5.\quad \frac{1^{m-1}}{e^{1^n x}-1}+\frac{2^{m-1}}{e^{2^n x}-1}+\frac{3^{m-1}}{e^{3^n x}-1}+\&c$$

$$=\frac{1}{m}\cdot\frac{\underline{\left|\frac{m}{n}\right.}}{x^{\frac{m}{n}}}S_{\frac{m}{n}}+\frac{S_{1+n-m}}{x}-\frac{1}{2}\cdot\frac{B_m}{m}\cos\frac{\pi m}{2}$$

$$+\frac{x}{\underline{|1}}\cdot\frac{B_2}{2}\cdot\frac{B_{m+n}}{m+n}\cos\frac{\pi(m+n)}{2}-\frac{x^3}{\underline{|3}}\frac{B_4}{4}\cdot\frac{B_{m+3n}}{m+3n}\cos\frac{\pi(m+3n)}{2}$$

$$+\frac{x^5}{\underline{|5}},\frac{B_6}{6}\cdot\frac{B_{m+5n}}{m+5n}\cos\frac{\pi(m+5n)}{2}-\&c.$$

For x = 2, m = 3, n = 5, we obtain:

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

Input:

$$\frac{1^2}{e^2-1}+\frac{2^2}{e^{2^5\times 2}-1}+\frac{3^2}{e^{10}-1}$$

Exact result:

$$\frac{1}{e^2-1}+\frac{9}{e^{10}-1}+\frac{4}{e^{64}-1}$$

Decimal approximation:

0.156926260668752841733041266454542489912925580659169535248...

0.156926260668….

Property:

$\frac{1}{-1+e^2}+\frac{9}{-1+e^{10}}+\frac{4}{-1+e^{64}}$ is a transcendental number

Alternate forms:

$$\frac{117}{80(e-1)}-\frac{117}{80(1+e)}-\frac{1}{8(1+e^2)}-\frac{1}{4(1+e^4)}+\frac{9(-4+3e-2e^2+e^3)}{10(1-e+e^2-e^3+e^4)}-\frac{9(4+3e+2e^2+e^3)}{10(1+e+e^2+e^3+e^4)}-\frac{1}{2(1+e^8)}-\frac{1}{1+e^{16}}-\frac{2}{1+e^{32}}$$

$$\left(14+15e^2+16e^4+17e^6+18e^8+14e^{10}+14e^{12}+14e^{14}+14e^{16}+14e^{18}+14e^{20}+14e^{22}+14e^{24}+14e^{26}+14e^{28}+14e^{30}+14e^{32}+14e^{34}+14e^{36}+14e^{38}+14e^{40}+14e^{42}+14e^{44}+14e^{46}+14e^{48}+14e^{50}+14e^{52}+14e^{54}+14e^{56}+14e^{58}+14e^{60}+14e^{62}+4e^{64}+3e^{66}+2e^{68}+e^{70}\right)\Big/\left((e-1)(1+e)(1+e^2)(1+e^4)(1-e+e^2-e^3+e^4)(1+e+e^2+e^3+e^4)(1+e^8)(1+e^{16})(1+e^{32})\right)$$

Alternative representation:

$$\frac{1^2}{e^2-1}+\frac{2^2}{e^{2^5\times 2}-1}+\frac{3^2}{e^{10}-1}=\frac{1^2}{\exp^2(z)-1}+\frac{2^2}{\exp^{2^5\times 2}(z)-1}+\frac{3^2}{\exp^{10}(z)-1}\quad\text{for } z=1$$

Series representations:

$$\frac{1^2}{e^2-1}+\frac{2^2}{e^{2^5\times 2}-1}+\frac{3^2}{e^{10}-1}=\frac{1}{-1+\sum_{k=0}^{\infty}\frac{2^k}{k!}}+\frac{9}{-1+\sum_{k=0}^{\infty}\frac{10^k}{k!}}+\frac{4}{-1+\sum_{k=0}^{\infty}\frac{64^k}{k!}}$$

$$\frac{1^2}{e^2-1}+\frac{2^2}{e^{2^5\times 2}-1}+\frac{3^2}{e^{10}-1}=\frac{1}{-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2}+\frac{9}{-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{10}}+\frac{4}{-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{64}}$$

$$\frac{1^2}{e^2-1}+\frac{2^2}{e^{2^5\times 2}-1}+\frac{3^2}{e^{10}-1}=\frac{4}{-1+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^{64}}}+\frac{9}{-1+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^{10}}}+\frac{1}{-1+\frac{1}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)^{2}}}$$

From the sum of the three results

0.156926260668 + 0.0725055406769425 + 0.1354191505858090829987

We obtain:

288/(0.156926260668 + 0.0725055406769425 + 0.1354191505858090829987) – 7

Input interpretation:

$$\frac{288}{0.156926260668 + 0.0725055406769425 + 0.1354191505858090829987} - 7$$

Result:

782.3634331387524190523973713994298037877662032186301443004...

782.363433.... result practically equal to the rest mass of Omega meson 782.65

((((288/(0.156926260668 + 0.07250554067 + 0.135419150585809) – 7))))*1/(2e)-4

Input interpretation:

$$\left(\frac{288}{0.156926260668 + 0.07250554067 + 0.135419150585809} - 7\right) \times \frac{1}{2\,e} - 4$$

Result:

139.90771129...

139.90771129… result practically equal to the rest mass of Pion meson 139.57

Alternative representation:

$$\frac{\frac{288}{0.1569262606680000+0.0725055+0.1354191505858090000} - 7}{2\,e} - 4 = \frac{\frac{288}{0.1569262606680000+0.0725055+0.1354191505858090000} - 7}{2\exp(z)} - 4 \quad \text{for } z = 1$$

Series representations:

$$\frac{\frac{288}{0.1569262606680000+0.0725055+0.1354191505858090000} - 7}{2\,e} - 4 = -4 + 391.182 \sum_{k=0}^{\infty} \frac{(-1)^k}{k!}$$

$$\frac{\frac{288}{0.1569262606680000+0.0725055+0.1354191505858090000} - 7}{2\,e} - 4 = -4 + \frac{391.182}{\sum_{k=0}^{\infty} \frac{1}{k!}}$$

$$\frac{\frac{288}{0.1569262606680000+0.0725055+0.1354191505858090000} - 7}{2\,e} - 4 = -4 + \frac{782.363}{\sum_{k=0}^{\infty} \frac{1+k}{k!}}$$

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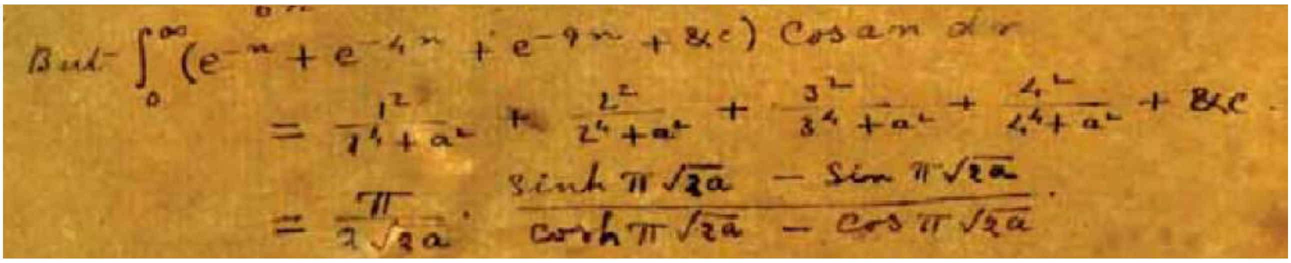

But $\int_0^\infty (e^{-x} + e^{-4x} + e^{-9x} + \&c) \cos ax \, dx$

$$= \frac{1^2}{1^4+a^2} + \frac{2^2}{2^4+a^2} + \frac{3^2}{3^4+a^2} + \frac{4^2}{4^4+a^2} + \&c.$$

$$= \frac{\pi}{2\sqrt{2a}} \cdot \frac{\sinh \pi\sqrt{2a} - \sin \pi\sqrt{2a}}{\cosh \pi\sqrt{2a} - \cos \pi\sqrt{2a}}.$$

For a = √π, we obtain:

(((1/(1+Pi) + 4/(16+Pi) + 9/(81+Pi) + 16/(256+Pi))))

Input:

$$\frac{1}{1+\pi} + \frac{4}{16+\pi} + \frac{9}{81+\pi} + \frac{16}{256+\pi}$$

Decimal approximation:

0.619126900492848208398758436404174065679752793032442804606...

0.6191269…

Property:

$\frac{1}{1+\pi} + \frac{4}{16+\pi} + \frac{9}{81+\pi} + \frac{16}{256+\pi}$ is a transcendental number

Alternate forms:

$$\frac{30\,(15\,744 + 5734\,\pi + 191\,\pi^2 + \pi^3)}{(1+\pi)(16+\pi)(81+\pi)(256+\pi)}$$

$$\frac{472\,320 + 172\,020\,\pi + 5730\,\pi^2 + 30\,\pi^3}{(1+\pi)(16+\pi)(81+\pi)(256+\pi)}$$

Alternative representations:

$$\frac{1}{1+\pi} + \frac{4}{16+\pi} + \frac{9}{81+\pi} + \frac{16}{256+\pi} = \frac{1}{1+\cos^{-1}(-1)} + \frac{4}{16+\cos^{-1}(-1)} + \frac{9}{81+\cos^{-1}(-1)} + \frac{16}{256+\cos^{-1}(-1)}$$

$$\frac{1}{1+\pi} + \frac{4}{16+\pi} + \frac{9}{81+\pi} + \frac{16}{256+\pi} = \frac{1}{1+180\,°} + \frac{4}{16+180\,°} + \frac{9}{81+180\,°} + \frac{16}{256+180\,°}$$

$$\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}=\frac{1}{1+2E(0)}+\frac{4}{16+2E(0)}+\frac{9}{81+2E(0)}+\frac{16}{256+2E(0)}$$

Series representations:

$$\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}=\frac{15\left(1968+2867\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+382\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2+8\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3\right)}{\left(4+\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)\left(64+\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)\left(1+4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)\left(81+4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)}$$

$$\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}=\left(30\left(15\,744+5734\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)+191\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2+\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^3\right)\right)\Big/\left(\left(1+\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)\left(16+\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)\left(81+\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)\left(256+\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)\right)$$

$$\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}=$$

$$\left(30\left(15744+5734\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}+\right.\right.$$

$$191\left(\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^2+$$

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

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

$$\left(16+\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)$$

$$\left(81+\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)$$

$$\left.\left(256+\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)\right)$$

(((1/(1+Pi) + 4/(16+Pi) + 9/(81+Pi) + 16/(256+Pi))))^1/64

Input:

$$\sqrt[64]{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}$$

Decimal approximation:

0.9925366616497828224964349823206853672456762614284742667 47...

0.9925366616…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Property:

$$\sqrt[64]{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}} \text{ is a transcendental number}$$

Alternate forms:

$$\sqrt[64]{\frac{30\left(15\,744+5734\,\pi+191\,\pi^2+\pi^3\right)}{331\,776+357\,904\,\pi+26\,481\,\pi^2+354\,\pi^3+\pi^4}}$$

$$\sqrt[64]{\frac{472\,320+172\,020\,\pi+5730\,\pi^2+30\,\pi^3}{(1+\pi)(16+\pi)(81+\pi)(256+\pi)}}$$

Series representations:

$$\sqrt[64]{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}} =$$

$$\sqrt[64]{15}\left(\left(1968+2867\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+382\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2+8\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3\right)\Big/\left(20\,736+89\,476\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+26\,481\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2+1416\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3+16\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^4\right)\right)\wedge(1/64)$$

$$\sqrt[64]{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}} = \sqrt[64]{30}\,\Bigg(\Bigg(15\,744+5734\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)+ 191\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2+ \left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^3\Bigg)\Bigg/ \Bigg(331\,776+357\,904\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)+ 26\,481\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2+ 354\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^3+ \left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^4\Bigg)\Bigg)\,\text{^}\,(1/64)$$

$$\sqrt[64]{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}} = \sqrt[64]{30}\,\Bigg(\Bigg(15\,744+5734\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}+ 191\left(\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^2+ \left(\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^3\Bigg)\Bigg/ \Bigg(331\,776+357\,904\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}+ 26\,481\left(\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^2+ 354\left(\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^3+ \left(\sum_{k=0}^{\infty}-\frac{4\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}\right)^4\Bigg)\Bigg)\,\text{^}\,(1/64)$$

2log base 0.9925366616(((1/(1+Pi) + 4/(16+Pi) + 9/(81+Pi) + 16/(256+Pi))))-Pi+1/golden ratio

Input interpretation:

$$2\log_{0.9925366616}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.47644...

125.47644… 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:

$$2\log_{0.992537}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)-\pi+\frac{1}{\phi}=$$
$$-\pi+\frac{1}{\phi}+\frac{2\log\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)}{\log(0.992537)}$$

Series representations:

$$2\log_{0.992537}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)^k}{k}}{\log(0.992537)}$$

$$2\log_{0.992537}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-266.977\log\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)-$$
$$2\log\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)\sum_{k=0}^{\infty}(-0.00746334)^k\,G(k)$$

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

2log base 0.9925366616(((1/(1+Pi) + 4/(16+Pi) + 9/(81+Pi) + 16/(256+Pi))))+11+1/golden ratio

Where 11 is a Lucas number

Input interpretation:

$$2\log_{0.9925366616}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.61803...

139.61803… result practically equal to the rest mass of Pion meson 139.57

Alternative representation:

$$2\log_{0.992537}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}+\frac{2\log\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)}{\log(0.992537)}$$

Series representations:

$$2\log_{0.992537}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)^k}{k}}{\log(0.992537)}$$

$$2\log_{0.992537}\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-266.977\log\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)-2\log\left(\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}\right)\sum_{k=0}^{\infty}(-0.00746334)^k\,G(k)$$

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

1/ (((1/(1+Pi) + 4/(16+Pi) + 9/(81+Pi) + 16/(256+Pi))))+Pi/10^3

Input:

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}$$

Decimal approximation:

1.618319352179080504387245251256552543281800196823481937823...

1.618319352179…. result that is a very good approximation to the value of the golden ratio 1,618033988749...

Property:

$$\frac{\pi}{1000}+\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}} \text{ is a transcendental number}$$

Alternate forms:

$$\frac{33\,177\,600+35\,837\,632\,\pi+2\,665\,302\,\pi^2+35\,973\,\pi^3+103\,\pi^4}{3000\,(15\,744+5734\,\pi+191\,\pi^2+\pi^3)}$$

$$\frac{163}{30}+\frac{103\,\pi}{3000}+\frac{-372\,416-98\,747\,\pi-1731\,\pi^2}{5\,(15\,744+5734\,\pi+191\,\pi^2+\pi^3)}$$

$$\frac{163}{30}+\frac{103\,\pi}{3000}-\frac{372\,416+98\,747\,\pi+1731\,\pi^2}{5\,(15\,744+5734\,\pi+191\,\pi^2+\pi^3)}$$

Alternative representations:

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}=$$
$$\frac{\cos^{-1}(-1)}{10^3}+\frac{1}{\frac{1}{1+\cos^{-1}(-1)}+\frac{4}{16+\cos^{-1}(-1)}+\frac{9}{81+\cos^{-1}(-1)}+\frac{16}{256+\cos^{-1}(-1)}}$$

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}=\frac{180\,°}{10^3}+\frac{1}{\frac{1}{1+180\,°}+\frac{4}{16+180\,°}+\frac{9}{81+180\,°}+\frac{16}{256+180\,°}}$$

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}=\frac{2\,E(0)}{10^3}+\frac{1}{\frac{1}{1+2\,E(0)}+\frac{4}{16+2\,E(0)}+\frac{9}{81+2\,E(0)}+\frac{16}{256+2\,E(0)}}$$

Series representations:

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}=\left(1\,036\,800+4\,479\,704\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+1\,332\,651\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2+71\,946\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3+824\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^4\right)\Big/\left(750\left(1968+2867\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+382\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2+8\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^3\right)\right)$$

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}=\left(33\,177\,600+35\,837\,632\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)+2\,665\,302\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2+35\,973\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^3+103\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^4\right)\Big/\left(3000\left(15\,744+5734\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)+191\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^2+\left(\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)\right)^3\right)\right)$$

$$\frac{1}{\frac{1}{1+\pi}+\frac{4}{16+\pi}+\frac{9}{81+\pi}+\frac{16}{256+\pi}}+\frac{\pi}{10^3}=$$

$$\left(33\,177\,600+35\,837\,632\times\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)+\right.$$
$$2\,665\,302\left(\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)\right)^2+$$
$$35\,973\left(\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)\right)^3+$$
$$\left.103\left(\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)\right)^4\right)\Big/$$
$$\left(3000\left(15\,744+5734\times\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)+\right.\right.$$
$$191\left(\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)\right)^2+$$
$$\left.\left.\left(\sum_{k=0}^{\infty}16^{-k}\left(\frac{1}{-5-8k}-\frac{1}{2+4k}+\frac{4}{1+8k}-\frac{1}{6+8k}\right)\right)^3\right)\right)$$

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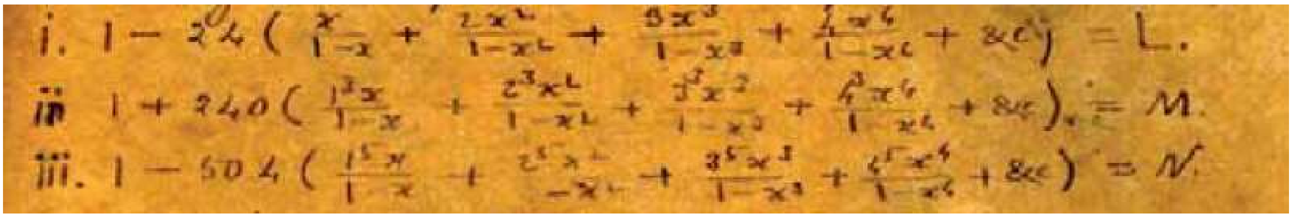


i. $1-24\left(\frac{x}{1-x}+\frac{2x^2}{1-x^2}+\frac{3x^3}{1-x^3}+\frac{4x^4}{1-x^4}+\&c\right)=L.$

ii. $1+240\left(\frac{1^3x}{1-x}+\frac{2^3x^2}{1-x^2}+\frac{3^3x^3}{1-x^3}+\frac{4^3x^4}{1-x^4}+\&c\right)=M.$

iii. $1-504\left(\frac{1^5x}{1-x}+\frac{2^5x^2}{1-x^2}+\frac{3^5x^3}{1-x^3}+\frac{4^5x^4}{1-x^4}+\&c\right)=N.$

For x = 2, we obtain:

1-24(((2/(1-2)+2*4/(1-4)+3*8/(1-8)+4*16/(1-16)))

Input:

$$1-24\left(\frac{2}{1-2}+2\times\frac{4}{1-4}+3\times\frac{8}{1-8}+4\times\frac{16}{1-16}\right)$$

Exact result:

$$\frac{10\,419}{35}$$

Decimal approximation:

297.685714285714285714285714285714285714285714285714285714285714285714 2...

297.68571428…

1+240(((2/(1-2)+8*4/(1-4)+27*8/(1-8)+64*16/(1-16)))

Input:

$$1+240\left(\frac{2}{1-2}+8\times\frac{4}{1-4}+27\times\frac{8}{1-8}+64\times\frac{16}{1-16}\right)$$

Exact result:

$$-\frac{187801}{7}$$

Decimal approximation:

−26828.714285714285714285714285714285714285714285714285714285714285714 2...

-26828.7142857…

1-504(((2/(1-2)+32*4/(1-4)+243*8/(1-8)+1024*16/(1-16)))

Input:

$$1-504\left(\frac{2}{1-2}+32\times\frac{4}{1-4}+243\times\frac{8}{1-8}+1024\times\frac{16}{1-16}\right)$$

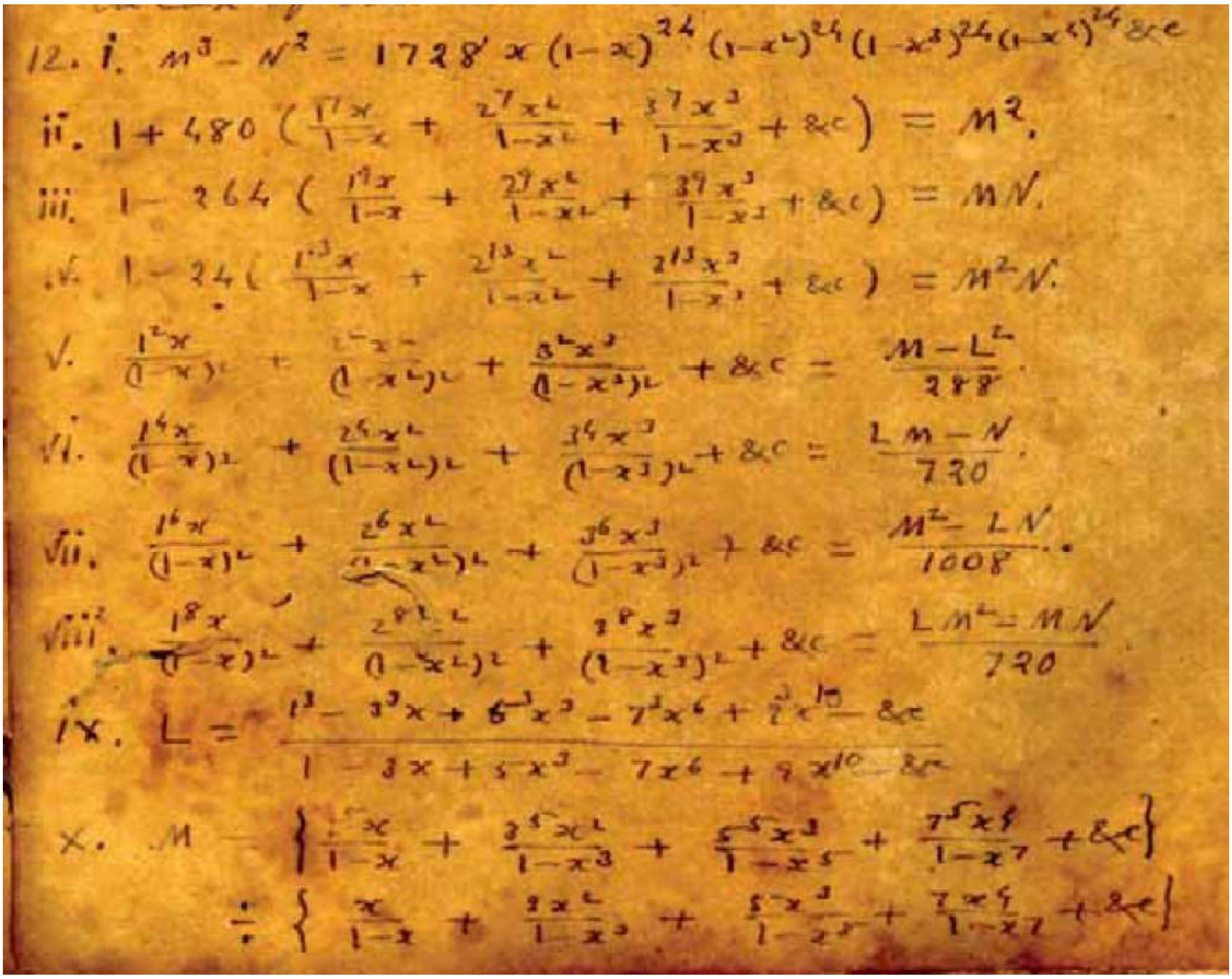
Exact result:

$$\frac{3564917}{5}$$

Decimal form:

712983.4

712983.4



12. i. $M^3 - N^2 = 1728x(1-x)^{24}(1-x^2)^{24}(1-x^3)^{24}(1-x^4)^{24}$ &c

ii. $1 + 480\left(\frac{1^7x}{1-x} + \frac{2^7x^2}{1-x^2} + \frac{3^7x^3}{1-x^3} + \&c\right) = M^2.$

iii. $1 - 264\left(\frac{1^9x}{1-x} + \frac{2^9x^2}{1-x^2} + \frac{3^9x^3}{1-x^3} + \&c\right) = MN.$

iv. $1 - 24\left(\frac{1^{13}x}{1-x} + \frac{2^{13}x^2}{1-x^2} + \frac{3^{13}x^3}{1-x^3} + \&c\right) = M^2N.$

v. $\frac{1^2x}{(1-x)^2} + \frac{2^2x^2}{(1-x^2)^2} + \frac{3^2x^3}{(1-x^3)^2} + \&c = \frac{M-L^2}{288}.$

vi. $\frac{1^4x}{(1-x)^2} + \frac{2^4x^2}{(1-x^2)^2} + \frac{3^4x^3}{(1-x^3)^2} + \&c = \frac{LM-N}{720}.$

vii. $\frac{1^6x}{(1-x)^2} + \frac{2^6x^2}{(1-x^2)^2} + \frac{3^6x^3}{(1-x^3)^2} + \&c = \frac{M^2-LN}{1008}.$

viii. $\frac{1^8x}{(1-x)^2} + \frac{2^8x^2}{(1-x^2)^2} + \frac{3^8x^3}{(1-x^3)^2} + \&c = \frac{LM^2-MN}{720}$

ix. $L = \frac{1^3 - 3^3x + 5^3x^3 - 7^3x^6 + 9^3x^{10} - \&c}{1 - 3x + 5x^3 - 7x^6 + 9x^{10} - \&c}$

x. $M = \left\{\frac{1^5x}{1-x} + \frac{3^5x^2}{1-x^3} + \frac{5^5x^3}{1-x^5} + \frac{7^5x^4}{1-x^7} + \&c\right\} \div \left\{\frac{x}{1-x} + \frac{3x^2}{1-x^3} + \frac{5x^3}{1-x^5} + \frac{7x^4}{1-x^7} + \&c\right\}$

1728*2 * (1-2)^24*(1-4)^24*(1-8)^24*(1-16)^24

Input:

$1728 \times 2\,(1-2)^{24}\,(1-4)^{24}\,(1-8)^{24}\,(1-16)^{24}$

Result:

3 147 944 194 510 707 795 152 038 178 692 525 175 032 558 799 743 652 343 750 000 \.
000

Decimal approximation:

$3.147944194510707795152038178692525175032558799743652\ldots \times 10^{63}$

$3.147944194510\ldots.*10^{63}$

ii. $1 + 480\left(\frac{1^7x}{1-x} + \frac{2^7x^2}{1-x^2} + \frac{3^7x^3}{1-x^3} + \&c\right) = M^2.$

1+480(1^7*2/(1-2)+2^7*2^2/(1-2^2)+3^7*2^3/(1-2^3))

Input:

$$1+480\left(1^{7}\times\frac{2}{1-2}+2^{7}\times\frac{2^{2}}{1-2^{2}}+3^{7}\times\frac{2^{3}}{1-2^{3}}\right)$$

Exact result:

$$-\frac{8978233}{7}$$

Decimal approximation:

$-1.28260471428571428571428571428571428571428571428571 42\ldots\times 10^{6}$

$-1.2826047142857\ldots..*10^{6}$

iii. $1-264\left(\frac{1^{9}x}{1-x}+\frac{2^{9}x^{2}}{1-x^{2}}+\frac{3^{9}x^{3}}{1-x^{3}}+\&c\right)=MN.$

1-264(1^9*2/(1-2)+2^9*2^2/(1-2^2)+3^9*2^3/(1-2^3))

Input:

$$1-264\left(1^{9}\times\frac{2}{1-2}+2^{9}\times\frac{2^{2}}{1-2^{2}}+3^{9}\times\frac{2^{3}}{1-2^{3}}\right)$$

Exact result:

$$\frac{42835767}{7}$$

Decimal approximation:

$6.119395285714285714285714285714285714285714285714 28571\ldots\times 10^{6}$

$6.1193952857\ldots.*10^{6}$

iv. $1-24\left(\frac{1^{13}x}{1-x}+\frac{2^{13}x^{2}}{1-x^{2}}+\frac{2^{13}x^{3}}{1-x^{3}}+\&c\right)=M^{2}N.$

1-24(1^13*2/(1-2)+2^13*2^2/(1-2^2)+3^13*2^3/(1-2^3))

Input:

$$1-24\left(1^{13}\times\frac{2}{1-2}+2^{13}\times\frac{2^{2}}{1-2^{2}}+3^{13}\times\frac{2^{3}}{1-2^{3}}\right)$$

Exact result:

$\frac{307945367}{7}$

Decimal approximation:

$4.39921952857142857142857142857142857142857142857142857\ldots \times 10^7$

$4.3992195285714285\ldots*10^7$

From the sum of the three above results, we obtain:

(-1.2826047142857e+6 + 6.1193952857e+6 + 4.3992195285714285e+7)

Input interpretation:

$-1.2826047142857 \times 10^6 + 6.1193952857 \times 10^6 + 4.3992195285714285 \times 10^7$

Result:

$4.8828985857128585 \times 10^7$

$4.88289858571\ldots*10^7$

And:

ln(-1.2826047142857e+6 + 6.1193952857e+6 + 4.3992195285714285e+7)

Input interpretation:

$\log\left(-1.2826047142857 \times 10^6 + 6.1193952857 \times 10^6 + 4.3992195285714285 \times 10^7\right)$

$\log(x)$ is the natural logarithm

Result:

$17.70383466697\ldots$

17.70383466697.... result very near to the black hole entropy 17.7715

We have also:

ln(-1.2826047142857e+6 + 6.1193952857e+6 + 4.3992195285714285e+7)*8-2

where 8 and 2 are Fibonacci numbers

Input interpretation:

$$\log\left(-1.2826047142857\times 10^{6}+6.1193952857\times 10^{6}+4.399219528571428 5\times 10^{7}\right)\times 8-2$$

$\log(x)$ is the natural logarithm

Result:

139.6306773358...

139.6306773358... result practically equal to the rest mass of Pion meson 139.57

We have also, dividing by 248 (the dimension of Lie Group E8) and subtracting 7, that is a Lucas number:

1/248(-1.2826047142857e+6 + 6.1193952857e+6 + 4.3992195285714e+7)-7

Input interpretation:

$$\frac{1}{248}\left(-1.2826047142857\times 10^{6}+6.1193952857\times 10^{6}+4.3992195285714\times 10^{7}\right)-7$$

Result:

196884.07200454959677419354838709677419354838709677419354 83...

196884.0720045....

196884 is a fundamental number of the following j-invariant

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

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

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

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

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

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

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

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

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

and we obtain also:

sqrt(((1/248(-1.2826047e+6 + 6.1193952e+6 + 4.3992195e+7)-7)))*1/3-8-1/golden ratio

Input interpretation:

$$\sqrt{\frac{1}{248}\left(-1.2826047\times 10^{6}+6.1193952\times 10^{6}+4.3992195\times 10^{7}\right)-7}\times\frac{1}{3}-8-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.28737...

139.28737… result practically equal to the rest mass of Pion meson 139.57

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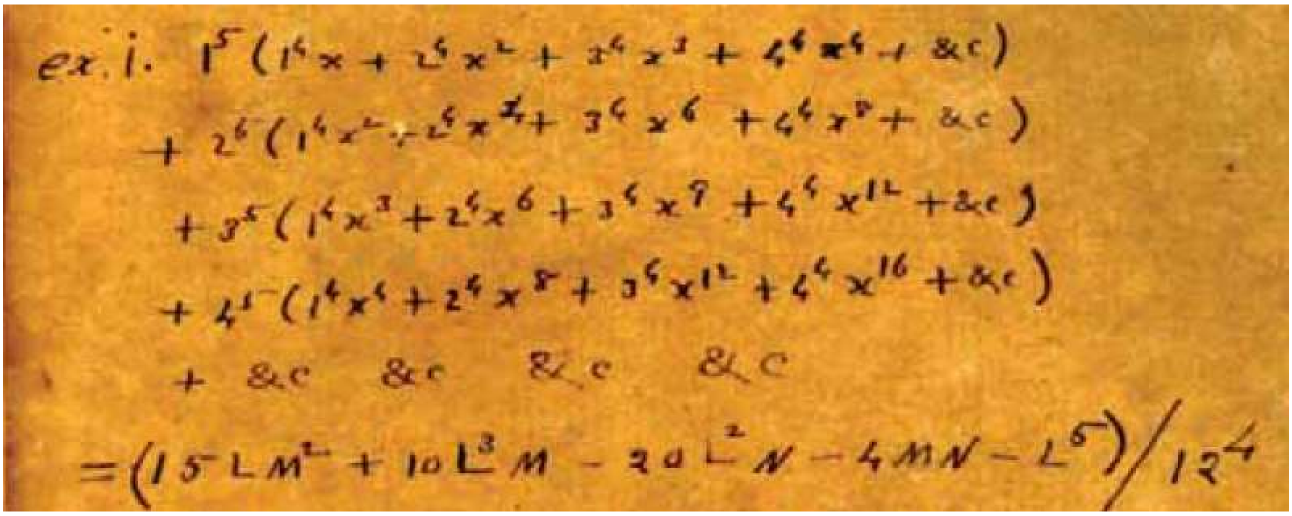


ex. i. $1^5(1^4x+2^4x^2+3^4x^3+4^4x^4+\&c)$

$+2^5(1^4x^2+2^4x^4+3^4x^6+4^4x^8+\&c)$

$+3^5(1^4x^3+2^4x^6+3^4x^9+4^4x^{12}+\&c)$

$+4^5(1^4x^4+2^4x^8+3^4x^{12}+4^4x^{16}+\&c)$

$+$ &c &c &c &c

$=(15LM^2+10L^3M-20L^2N-4MN-L^5)/12^4$

For 297.68571428 = L; 712983.4 = N; -26828.7142857 = M

We obtain:

(((15*297.68571428*(-26828.7142857)^2+10*297.68571428^3*(-26828.7142857)-20*297.68571428^2*712983.4-4*(-26828.7142857)*712983.4-297.68571428^5)))/12^4

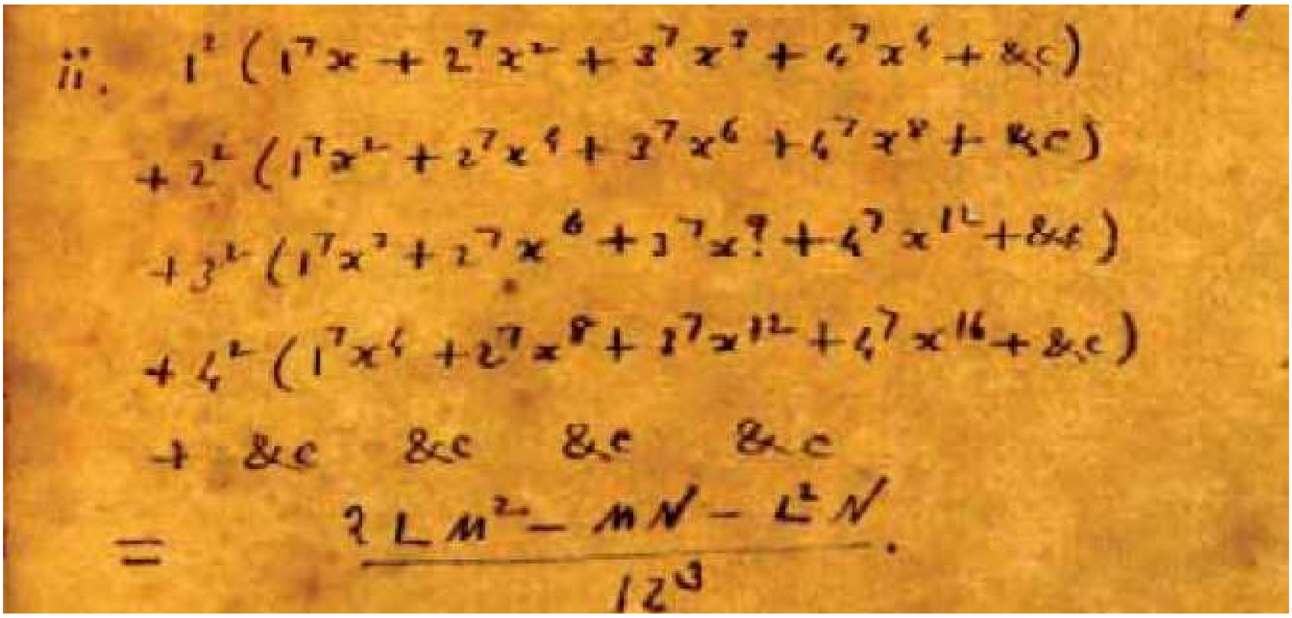
Input interpretation:

$$\frac{1}{12^4}(15\times 297.68571428\,(-26\,828.7142857)^2 + 10\times 297.68571428^3\times(-26\,828.7142857) + 20\times 297.68571428^2\times(-712\,983.4) + 4\times(-26\,828.7142857)\times(-712\,983.4) - 297.68571428^5)$$

Result:

$-3.5629905974215259284305364738611155043135877830151604\ldots\times 10^8$

$-3.5629905974215\ldots*10^8$



ii. $1^2(1^7x + 2^7x^2 + 3^7x^3 + 4^7x^4 + \&c)$

$+2^2(1^7x^2 + 2^7x^4 + 3^7x^6 + 4^7x^8 + \&c)$

$+3^2(1^7x^3 + 2^7x^6 + 3^7x^9 + 4^7x^{12} + \&c)$

$+4^2(1^7x^4 + 2^7x^8 + 3^7x^{12} + 4^7x^{16} + \&c)$

$+$ &c &c &c &c

$$= \frac{2LM^2 - MN - L^2N}{12^3}.$$

297.68571428 = L;   -1.2826047142857e+6 = M^2;

712983.4 = N; -26828.7142857 = M

We have that:

((((2*297.68571428 * -26828.7142857^2) – (712983.4* -26828.7142857) – (297.68571428^2*712983.4)))) / 12^3

Input interpretation:

$$\frac{1}{12^3}\left(2\times 26\,828.7142857^2\times(-297.68571428)-712\,983.4\times(-26\,828.7142857)-297.68571428^2\times 712\,983.4\right)$$

Result:

$-2.73489734820495377436419919396663425925925925925925925 92\ldots\times 10^8$

$-2.7348973482\ldots*10^8$

Or:

$6.1193952857\ldots.*10^6$ = MN; -1.2826047142857e+6 = M^2

((((2*297.68571428*-1.2826047142857e+6) – (6.1193952857e+6) – (297.68571428^2*712983.4)))) / 12^3

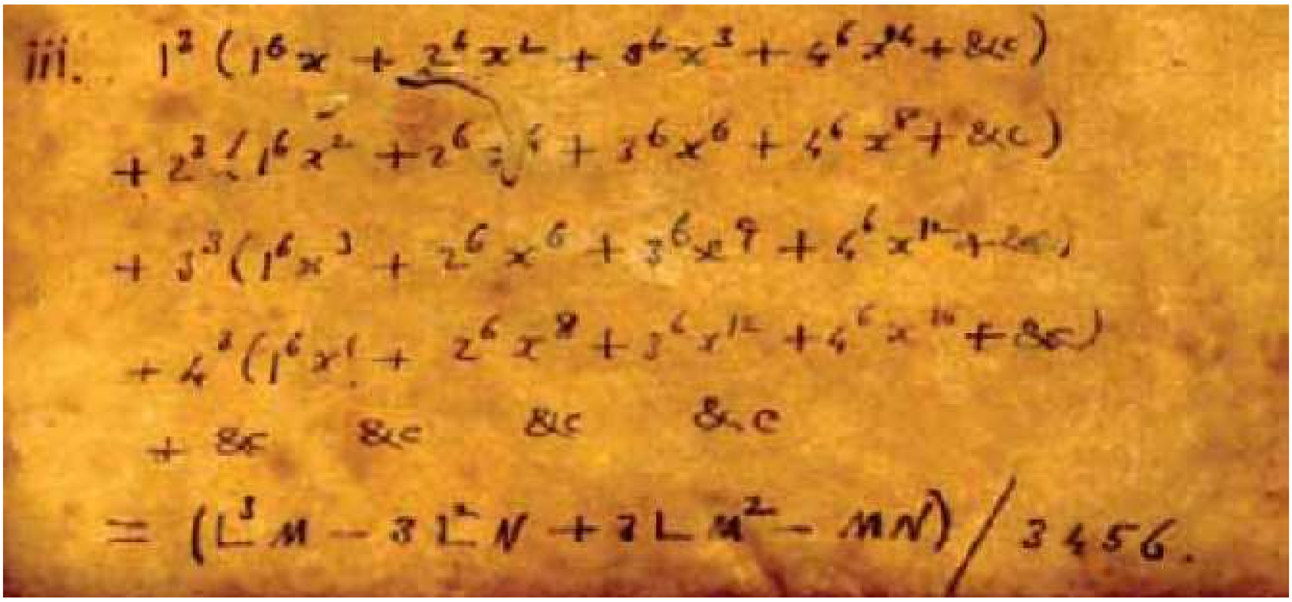
Input interpretation:

$$\frac{1}{12^3}\left(2\times 297.68571428\left(-1.2826047142857\times 10^6\right)-6.1193952857\times 10^6-297.68571428^2\times 712\,983.4\right)$$

Result:

$-3.700928350490976284825610333333333333333333333333333\ldots\times 10^7$

$-3.700928350490976\ldots.*10^7$



iii. $1^3\left(1^6x+2^6x^2+3^6x^3+4^6x^4+\&c\right)$

$+2^3\left(1^6x^2+2^6x^4+3^6x^6+4^6x^8+\&c\right)$

$+3^3\left(1^6x^3+2^6x^6+3^6x^9+4^6x^{12}+\&c\right)$

$+4^3\left(1^6x^4+2^6x^8+3^6x^{12}+4^6x^{16}+\&c\right)$

$+\&c \quad \&c \quad \&c \quad \&c$

$=\left(L^3M-3L^2N+3LM^2-MN\right)/3456.$

For 297.68571428 = L; 712983.4 = N; -26828.7142857 = M

We obtain:

(((297.68571428^3*(-26828.7142857)-3*297.68571428^2*712983.4+3*297.68571428*(-26828.7142857^2)-(-26828.7142857)*712983.4)))/3456

Input interpretation:

$$\frac{1}{3456}(297.68571428^3 \times (-26\,828.7142857) + 3 \times 297.68571428^2 \times (-712\,983.4) + 3 \times 297.68571428\left(-26\,828.7142857^2\right) - 26\,828.7142857 \times (-712\,983.4))$$

Result:

$$-4.40093522455306357081693273443789211588 15 \times 10^8$$

$-4.40093522455306...*10^8$

For the sum of the three results

-356299059.742152592843053647386111550431358778301516 04

-273489734.820495377436419919396663425925925925925925 92

-440093522.45530635708169327344378921158815

We obtain:

(-356299059.742152592 -273489734.820495377 -440093522.455306357)

Input interpretation:

$$-3.56299059742152592 \times 10^8 - 2.73489734820495377 \times 10^8 - 4.40093522455306357 \times 10^8$$

Result:

$$-1.069882317017954326 \times 10^9$$

-1069882317.017954326

And:

ln-(-356299059.742152592 -273489734.820495377 -440093522.455306357)

Input interpretation:

$$\log(-(-3.56299059742152592\times 10^{8} - 2.73489734820495377\times 10^{8} - 4.40093522455306357\times 10^{8}))$$

$\log(x)$ is the natural logarithm

Result:

20.79081449527616204...

20.790814495…..result very near to the black hole entropy 20.5520

Alternative representations:

$$\log(-(-3.5629905974215259200000\times 10^{8} - 2.7348973482049537700000\times 10^{8} - 4.4009352245530635700000\times 10^{8})) = \log_{e}(1.0698823170179543260000\times 10^{9})$$

$$\log(-(-3.5629905974215259200000\times 10^{8} - 2.7348973482049537700000\times 10^{8} - 4.4009352245530635700000\times 10^{8})) = \log(a)\log_{a}(1.0698823170179543260000\times 10^{9})$$

$$\log(-(-3.5629905974215259200000\times 10^{8} - 2.7348973482049537700000\times 10^{8} - 4.4009352245530635700000\times 10^{8})) = -\mathrm{Li}_{1}(-1.0698823160179543260000\times 10^{9})$$

Series representations:

$$\log(-(-3.5629905974215259200000\times 10^{8} - 2.7348973482049537700000\times 10^{8} - 4.4009352245530635700000\times 10^{8})) = \log(1.0698823160179543260000\times 10^{9}) - \sum_{k=1}^{\infty}\frac{(-1)^{k}\, e^{-20.790814494341479804787\,k}}{k}$$

$$\log(-(-3.5629905974215259200000\times 10^{8} - 2.7348973482049537700000\times 10^{8} - 4.4009352245530635700000\times 10^{8})) = 2\,i\,\pi\left\lfloor\frac{\arg(1.0698823170179543260000\times 10^{9} - x)}{2\,\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{(-1)^{k}\,(1.0698823170179543260000\times 10^{9} - x)^{k}\, x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(-(-3.5629905974215259200000\times 10^8 - 2.7348973482049537700000\times 10^8 - 4.4009352245530635700000\times 10^8)) = \left\lfloor \frac{\arg(1.06988231701795432600000\times 10^9 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(1.06988231701795432600000\times 10^9 - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (1.06988231701795432600000\times 10^9 - z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\log(-(-3.5629905974215259200000\times 10^8 - 2.7348973482049537700000\times 10^8 - 4.4009352245530635700000\times 10^8)) = \int_1^{1.06988231701795432600000\times 10^9} \frac{1}{t}\,dt$$

$$\log(-(-3.5629905974215259200000\times 10^8 - 2.7348973482049537700000\times 10^8 - 4.4009352245530635700000\times 10^8)) = \frac{1}{2 i \pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-20.7908144943414798047875\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1 < \gamma < 0$$

We have also:

ln-(-356299059.742152592 -273489734.820495377 -440093522.455306357)*2Pi+11-2

where 11 and 2 are Lucas numbers

Input interpretation:

$$\log(-(-3.56299059742152592\times 10^8 - 2.73489734820495377\times 10^8 - 4.40093522455306357\times 10^8))\times 2\pi + 11 - 2$$

$\log(x)$ is the natural logarithm

Result:

139.6325401610155514...

139.632540… result practically equal to the rest mass of Pion meson 139.57

Alternative representations:

$$\log(-(-3.5629905974215259200000\times 10^8 - 2.7348973482049537700000\times 10^8 - 4.4009352245530635700000\times 10^8))\,2\pi + 11 - 2 = 9 + 2\pi \log_e(1.06988231701795432600000\times 10^9)$$

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.73489734820495377000 \times 10^8 - 4.40093522455306357000 \times 10^8))\, 2\pi + 11 - 2 = 9 + 2\pi \log(a) \log_a(1.06988231701795432600 \times 10^9)$$

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.73489734820495377000 \times 10^8 - 4.40093522455306357000 \times 10^8))\, 2\pi + 11 - 2 = 9 - 2\pi \operatorname{Li}_1(-1.06988231601795432600 \times 10^9)$$

Series representations:

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.73489734820495377000 \times 10^8 - 4.40093522455306357000 \times 10^8))\, 2\pi + 11 - 2 = 9 + 2\pi \log(1.06988231601795432600 \times 10^9) - 2\pi \sum_{k=1}^{\infty} \frac{(-1)^k e^{-20.7908144943414798047 87 k}}{k}$$

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.73489734820495377000 \times 10^8 - 4.40093522455306357000 \times 10^8))\, 2\pi + 11 - 2 = 9 + 4 i \pi^2 \left\lfloor \frac{\arg(1.06988231701795432600 \times 10^9 - x)}{2\pi} \right\rfloor + 2\pi \log(x) - 2\pi \sum_{k=1}^{\infty} \frac{(-1)^k (1.06988231701795432600 \times 10^9 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.73489734820495377000 \times 10^8 - 4.40093522455306357000 \times 10^8))\, 2\pi + 11 - 2 = 9 + 4 i \pi^2 \left\lfloor -\frac{-\pi + \arg\left(\frac{1.06988231701795432600 \times 10^9}{z_0}\right) + \arg(z_0)}{2\pi} \right\rfloor + 2\pi \log(z_0) - 2\pi \sum_{k=1}^{\infty} \frac{(-1)^k (1.06988231701795432600 \times 10^9 - z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.73489734820495377000 \times 10^8 - 4.40093522455306357000 \times 10^8))\, 2\pi + 11 - 2 = 9 + 2\pi \int_1^{1.06988231701795432600 \times 10^9} \frac{1}{t}\, dt$$

$$\log(-(-3.56299059742152592000 \times 10^8 - 2.7348973482049537700000 \times 10^8 - 4.4009352245530635700000 \times 10^8))\, 2\pi + 11 - 2 = 9 + \frac{1}{i} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-20.7908144943414798047 87 s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds \quad \text{for } -1 < \gamma < 0$$

From the formula of the coefficients of the "5th order" mock theta function $\psi_1(q)$

a(n) ~ sqrt(phi) * exp(Pi*sqrt(n/15)) / (2*5^(1/4)*sqrt(n))

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

ϕ is the golden ratio

we obtain, for n = 109.3 the following result:

sqrt(golden ratio) * exp(Pi*sqrt(109.3/15)) / (2*5^(1/4)*sqrt(109.3))

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{109.3}{15}}\right)}{2 \sqrt[4]{5}\, \sqrt{109.3}}$$

ϕ is the golden ratio

Result:

196.058...

196.058…

Series representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}} = \frac{\exp\left(\pi\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(7.28667-z_0)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}}{2\sqrt[4]{5}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(109.3-z_0)^k z_0^{-k}}{k!}}$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}} = \left(\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(7.28667-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(7.28667-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \Big/ \left(2\sqrt[4]{5}\,\exp\left(i\pi\left\lfloor\frac{\arg(109.3-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(109.3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}} = \left(\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(7.28667-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(7.28667-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(7.28667-z_0)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(109.3-z_0)/(2\pi)\rfloor+1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor} z_0^{-1/2\lfloor\arg(109.3-z_0)/(2\pi)\rfloor+1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right) \Big/ \left(2\sqrt[4]{5}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(109.3-z_0)^k z_0^{-k}}{k!}\right)$$

and, with the previous expression, we obtain the following interesting equation:

-1/(1728Pi) (-356299059.742152592 -273489734.820495377 -440093522.455306357) - (((sqrt(golden ratio) * exp(Pi*sqrt(109.3/15)) / (2*5^(1/4)*sqrt(109.3))

Input interpretation:

$$-\frac{1}{1728\,\pi}\left(-3.56299059742152592\times10^{8}-2.73489734820495377\times10^{8}-4.40093522455306357\times10^{8}\right)-\sqrt{\phi}\times\frac{\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}}$$

ϕ is the golden ratio

Result:

196883.87...

196883.87….

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)

Series representations:

$$\frac{1}{1728\pi}\left(-3.56299059742152592000\times 10^{8} - 2.73489734820495377000\times 10^{8} - 4.40093522455306357000\times 10^{8}\right)(-1) - \frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}} = -\left(\left(0.100000000000000000000\left(-6.19144859385390234954\times 10^{6}\sum_{k=0}^{\infty}\frac{(-1)^{k}\left(-\frac{1}{2}\right)_{k}(109.3-z_{0})^{k}\,z_{0}^{-k}}{k!} + 3.34370152488211012002\,\pi\exp\left(\pi\sqrt{z_{0}}\sum_{k=0}^{\infty}\frac{(-1)^{k}\left(-\frac{1}{2}\right)_{k}(7.28667-z_{0})^{k}\,z_{0}^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^{k}\left(-\frac{1}{2}\right)_{k}(\phi-z_{0})^{k}\,z_{0}^{-k}}{k!}\right)\right)\Big/\left(\pi\sum_{k=0}^{\infty}\frac{(-1)^{k}\left(-\frac{1}{2}\right)_{k}(109.3-z_{0})^{k}\,z_{0}^{-k}}{k!}\right)\right)$$

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

$$\frac{1}{1728\pi}\left(-3.56299059742152592000\times 10^{8} - 2.73489734820495377000\times 10^{8} - 4.40093522455306357000\times 10^{8}\right)(-1) - \frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}} = -\left(\left(0.100000000000000000000\left(-6.19144859385390234954\times 10^{6}\exp\left(i\pi\left\lfloor\frac{\arg(109.3-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^{k}(109.3-x)^{k}\,x^{-k}\left(-\frac{1}{2}\right)_{k}}{k!} + 3.34370152488211012002\,\pi\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(7.28667-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^{k}(7.28667-x)^{k}\,x^{-k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^{k}(\phi-x)^{k}\,x^{-k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)\right)\Big/\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(109.3-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^{k}(109.3-x)^{k}\,x^{-k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)\right)$$

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

$$\frac{1}{1728\,\pi}\left(-3.5629905974215259200000\times10^{8}-2.7348973482049537700000\times10^{8}-4.4009352245530635700000\times10^{8}\right)(-1)-\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{109.3}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{109.3}}=$$

$$-\Bigg(\Bigg(0.10000000000000000000\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(109.3-z_0)/(2\pi)\rfloor}z_0^{-1/2\lfloor\arg(109.3-z_0)/(2\pi)\rfloor}$$

$$\Bigg(-6.1914485938539023495\times10^{6}\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(109.3-z_0)/(2\pi)\rfloor}$$

$$z_0^{1/2\lfloor\arg(109.3-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(109.3-z_0)^k\,z_0^{-k}}{k!}+$$

$$3.3437015248821101200\,\pi\exp\Bigg(\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(7.28667-z_0)/(2\pi)\rfloor}$$

$$z_0^{1/2(1+\lfloor\arg(7.28667-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(7.28667-z_0)^k\,z_0^{-k}}{k!}\Bigg)$$

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

$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\,z_0^{-k}}{k!}\Bigg)\Bigg)\Bigg/\left(\pi\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(109.3-z_0)^k\,z_0^{-k}}{k!}\right)\Bigg)$$

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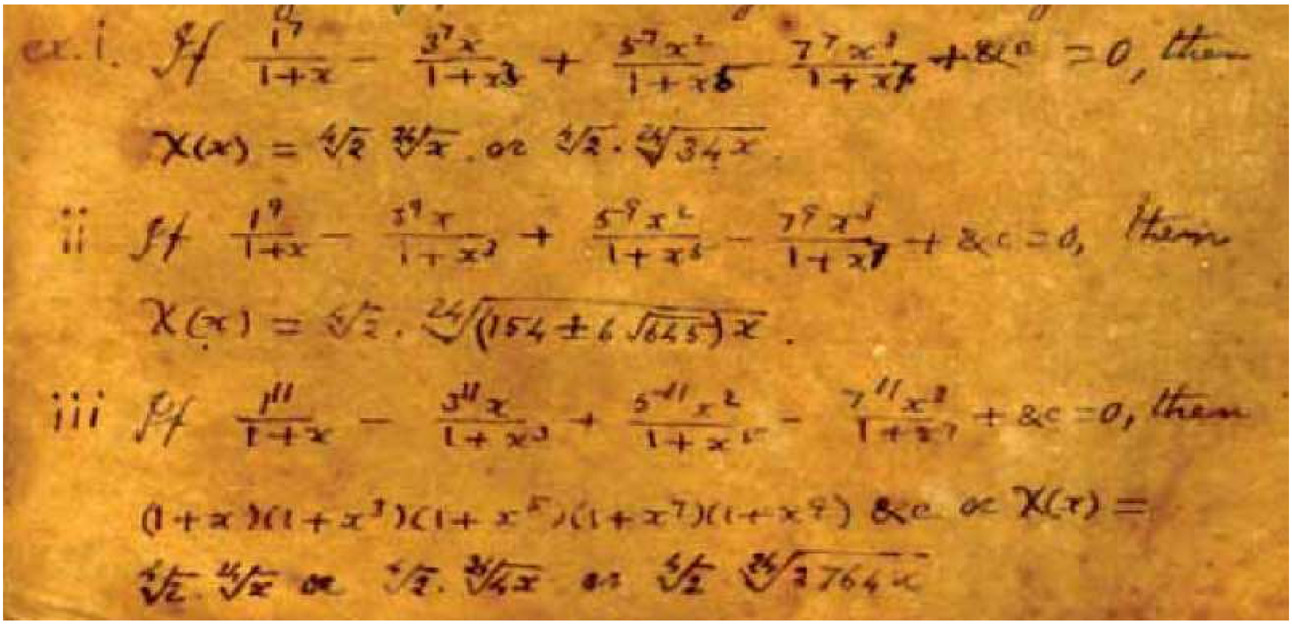

ex. i. If $\frac{1^7}{1+x} - \frac{3^7 x}{1+x^3} + \frac{5^7 x^2}{1+x^5} - \frac{7^7 x^3}{1+x^7} + \&c = 0$, then

$\chi(x) = \sqrt[4]{2}\,\sqrt[8]{x}$. or $\sqrt[4]{2} \cdot \sqrt[24]{34x}$.

ii If $\frac{1^9}{1+x} - \frac{3^9 x}{1+x^3} + \frac{5^9 x^2}{1+x^5} - \frac{7^9 x^3}{1+x^7} + \&c = 0$, then

$\chi(x) = \sqrt[4]{2} \cdot \sqrt[24]{(154 \pm 6\sqrt{645})x}$.

iii If $\frac{1^{11}}{1+x} - \frac{3^{11} x}{1+x^3} + \frac{5^{11} x^2}{1+x^5} - \frac{7^{11} x^3}{1+x^7} + \&c = 0$, then

$(1+x)(1+x^3)(1+x^5)(1+x^7)(1+x^9)$ &c or $\chi(x) =$

$\sqrt[4]{2} \cdot \sqrt[8]{x}$ or $\sqrt[4]{2} \cdot \sqrt[8]{4x}$ or $\sqrt[4]{2}\,\sqrt[24]{3764x}$

For x = 2, we obtain:

(2)^1/4 * (2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{2}$$

Result:

$$2^{7/24}$$

Decimal approximation:

1.224053543304655239132160216826038822387456572683921807769...

1.2240535433….

(2)^1/4 * (34*2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{34\times 2}$$

Result:

$$\sqrt[3]{2}\ \sqrt[24]{17}$$

Decimal approximation:

1.417790418185826872580576577513256812406227057233675690246...

1.4177904181858…..

(2)^1/4 * (((154+6*sqrt645)*2))^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2}$$

Exact result:

$$2^{7/24}\ \sqrt[24]{154+6\sqrt{645}}$$

Decimal approximation:

1.553798379832567849282597834058691109266699232353452412111...

1.55379837983256…..

Alternate form:

$$\sqrt[3]{2}\ \sqrt[24]{77+3\sqrt{645}}$$

Minimal polynomial:

$$x^{48}-39\,424\,x^{24}+8\,126\,464$$

(2)^1/4 * (((154-6*sqrt645)*2))^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{\left(154-6\sqrt{645}\right)\times 2}$$

Exact result:

$$2^{7/24}\ \sqrt[24]{154-6\sqrt{645}}$$

Decimal approximation:

1.248871926166649760260623186603230360634938018543309807283...

1.24887192616664976…..

Alternate form:

$$\sqrt[3]{2}\ \sqrt[24]{77-3\sqrt{645}}$$

Minimal polynomial:

$$x^{48}-39\,424\,x^{24}+8\,126\,464$$

(2)^1/4 * (4*2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{4\times 2}$$

Result:

$$2^{3/8}$$

Decimal approximation:

1.296839554651009665933754117792451159835345149424965512807...

1.296839554651......

(2)^1/4 * (2764*2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{2764\times 2}$$

Result:

$$2^{3/8}\ \sqrt[24]{691}$$

Decimal approximation:

1.702934067394305862706536481195677787140783359413309374154...

1.7029340673943….

From the sum and the difference of the various expressions, we obtain:

(2)^1/4 * (2)^1/24 + (2)^1/4 * (34*2)^1/24 + (2)^1/4 * (((154+6*sqrt645)*2))^1/24 + (2)^1/4 * (4*2)^1/24 + (2)^1/4 * (2764*2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{2} + \sqrt[4]{2}\ \sqrt[24]{34\times 2} + \sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2} + \sqrt[4]{2}\ \sqrt[24]{4\times 2} + \sqrt[4]{2}\ \sqrt[24]{2764\times 2}$$

Exact result:

$$2^{7/24} + 2^{3/8} + \sqrt[3]{2}\ \sqrt[24]{17} + 2^{3/8}\ \sqrt[24]{691} + 2^{7/24}\ \sqrt[24]{154+6\sqrt{645}}$$

Decimal approximation:

7.195415963368365489635625227386115691036511371109324797088...

7.195415963368…

Alternate forms:

$$2^{7/24}\left(1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\ \sqrt[24]{691}+\sqrt[24]{154+6\sqrt{645}}\right)$$

$$2^{7/24}\left(1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\ \sqrt[24]{691}+\sqrt[24]{2\left(77+3\sqrt{645}\right)}\right)$$

(2)^1/4 * (2)^1/24 - (2)^1/4 * (34*2)^1/24 - (2)^1/4 * (((154+6*sqrt645)*2))^1/24 - (2)^1/4 * (4*2)^1/24 - (2)^1/4 * (2764*2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{2} - \sqrt[4]{2}\ \sqrt[24]{34\times 2} - \sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2} - \sqrt[4]{2}\ \sqrt[24]{4\times 2} - \sqrt[4]{2}\ \sqrt[24]{2764\times 2}$$

Exact result:

$$2^{7/24} - 2^{3/8} - \sqrt[3]{2}\ \sqrt[24]{17} - 2^{3/8}\ \sqrt[24]{691} - 2^{7/24}\ \sqrt[24]{154+6\sqrt{645}}$$

Decimal approximation:

−4.74730887675905501137130479373403804626159822574148118154...

-4.747308876759055….

Alternate forms:

$$-2^{7/24}\left(-1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\ \sqrt[24]{691}+\sqrt[24]{154+6\sqrt{645}}\right)$$

$$-2^{7/24}\left(-1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\ \sqrt[24]{691}+\sqrt[24]{2\left(77+3\sqrt{645}\right)}\right)$$

(2)^1/4 * (2)^1/24 + (2)^1/4 * (34*2)^1/24 + (2)^1/4 * (((154-6*sqrt645)*2))^1/24 + (2)^1/4 * (4*2)^1/24 + (2)^1/4 * (2764*2)^1/24

Input:

$$\sqrt[4]{2}\ \sqrt[24]{2} + \sqrt[4]{2}\ \sqrt[24]{34\times 2} + \sqrt[4]{2}\ \sqrt[24]{\left(154-6\sqrt{645}\right)\times 2} + \sqrt[4]{2}\ \sqrt[24]{4\times 2} + \sqrt[4]{2}\ \sqrt[24]{2764\times 2}$$

Exact result:

$$2^{7/24} + 2^{3/8} + \sqrt[3]{2}\ \sqrt[24]{17} + 2^{3/8}\ \sqrt[24]{691} + 2^{7/24}\ \sqrt[24]{154-6\sqrt{645}}$$

Decimal approximation:

6.890489509702447400613650579930654942404750157299182192260...

6.8904895097024474…..

Alternate forms:

$$2^{7/24}\left(1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\,\sqrt[24]{691}+\sqrt[24]{154-6\sqrt{645}}\right)$$

$$2^{7/24}\left(1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\,\sqrt[24]{691}+\sqrt[24]{2\left(77-3\sqrt{645}\right)}\right)$$

(2)^1/4 * (2)^1/24 - (2)^1/4 * (34*2)^1/24 - (2)^1/4 * (((154-6*sqrt645)*2))^1/24 - (2)^1/4 * (4*2)^1/24 - (2)^1/4 * (2764*2)^1/24

Input:

$$\sqrt[4]{2}\,\sqrt[24]{2}-\sqrt[4]{2}\,\sqrt[24]{34\times 2}-\sqrt[4]{2}\,\sqrt[24]{\left(154-6\sqrt{645}\right)\times 2}-\sqrt[4]{2}\,\sqrt[24]{4\times 2}-\sqrt[4]{2}\,\sqrt[24]{2764\times 2}$$

Exact result:

$$2^{7/24}-2^{3/8}-\sqrt[3]{2}\,\sqrt[24]{17}-2^{3/8}\,\sqrt[24]{691}-2^{7/24}\,\sqrt[24]{154-6\sqrt{645}}$$

Decimal approximation:

-4.44238242309313692234933014627857729762983701193133857672...

-4.4423824230931….

Alternate forms:

$$-2^{7/24}\left(-1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\,\sqrt[24]{691}+\sqrt[24]{154-6\sqrt{645}}\right)$$

$$-2^{7/24}\left(-1+\sqrt[12]{2}+\sqrt[24]{34}+\sqrt[12]{2}\,\sqrt[24]{691}+\sqrt[24]{2\left(77-3\sqrt{645}\right)}\right)$$

From the product and the division, we obtain:

(((2)^1/4 * (2)^1/24)) * (((2)^1/4 * (34*2)^1/24)) * (((2)^1/4 * (((154+6*sqrt645)*2))^1/24)) * (((2)^1/4 * (4*2)^1/24)) * (((2)^1/4 * (2764*2)^1/24))

Input:

$$\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)$$

Exact result:

$$2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}$$

Decimal approximation:

5.9551293436631275839105149601043376903614867921575091622 39...

5.9551293436631….

Alternate form:

$$2\times 2^{17/24}\sqrt[24]{11\,747\left(77+3\sqrt{645}\right)}$$

Minimal polynomial:

$$x^{48}-3\,978\,116\,632\,177\,278\,976\,x^{24}+82\,743\,762\,879\,974\,765\,661\,427\,736\,630\,001\,664$$

(((2)^1/4 * (2)^1/24)) * (((2)^1/4 * (34*2)^1/24)) * (((2)^1/4 * (((154-6*sqrt645)*2))^1/24)) * (((2)^1/4 * (4*2)^1/24)) * (((2)^1/4 * (2764*2)^1/24))

Input:

$$\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154-6\sqrt{645}\right)\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)$$

Exact result:

$$2\times 2^{2/3}\sqrt[24]{11\,747\left(154-6\sqrt{645}\right)}$$

Decimal approximation:

4.7864600391677034809530845002130612644010735421196588389 64...

4.7864600391677….

Alternate form:

$$2\times 2^{17/24}\sqrt[24]{11\,747\left(77-3\sqrt{645}\right)}$$

Minimal polynomial:

$$x^{48} - 3\,978\,116\,632\,177\,278\,976\,x^{24} + 82\,743\,762\,879\,974\,765\,661\,427\,736\,630\,001\,664$$

1/(((2)^1/4 * (2)^1/24)) * 1/(((2)^1/4 * (34*2)^1/24)) * 1/ (((2)^1/4 * (((154+6*sqrt645)*2))^1/24)) * 1/(((2)^1/4 * (4*2)^1/24)) * 1/(((2)^1/4 * (2764*2)^1/24))

Input:

$$\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2}} \times \frac{1}{\sqrt[4]{2}\ \sqrt[24]{34\times 2}} \times \frac{1}{\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2}} \times \frac{1}{\sqrt[4]{2}\ \sqrt[24]{4\times 2}} \times \frac{1}{\sqrt[4]{2}\ \sqrt[24]{2764\times 2}}$$

Exact result:

$$\frac{1}{2\times 2^{2/3}\ \sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}$$

Decimal approximation:

0.16792246520457246454211806434201049976141950987629981523 3…

0.167922465204572…

Alternate forms:

$$\frac{1}{2\times 2^{17/24}\ \sqrt[24]{11\,747\left(77+3\sqrt{645}\right)}}$$

$$\frac{\sqrt[24]{\frac{77-3\sqrt{645}}{364\,157}}}{2\times 2^{19/24}}$$

Minimal polynomial:

$$82\,743\,762\,879\,974\,765\,661\,427\,736\,630\,001\,664\,x^{48} - 3\,978\,116\,632\,177\,278\,976\,x^{24} + 1$$

1/(((2)^1/4 * (2)^1/24)) * 1/(((2)^1/4 * (34*2)^1/24)) * 1/ (((2)^1/4 * (((154-6*sqrt645)*2))^1/24)) * 1/(((2)^1/4 * (4*2)^1/24)) * 1/(((2)^1/4 * (2764*2)^1/24))

Input:

$$\frac{1}{\sqrt[4]{2}\,\sqrt[24]{2}} \times \frac{1}{\sqrt[4]{2}\,\sqrt[24]{34 \times 2}} \times \frac{1}{\sqrt[4]{2}\,\sqrt[24]{\left(154 - 6\sqrt{645}\right) \times 2}} \times \frac{1}{\sqrt[4]{2}\,\sqrt[24]{4 \times 2}} \times \frac{1}{\sqrt[4]{2}\,\sqrt[24]{2764 \times 2}}$$

Exact result:

$$\frac{1}{2 \times 2^{2/3}\,\sqrt[24]{11\,747\left(154 - 6\sqrt{645}\right)}}$$

Decimal approximation:

0.208922667653543308185236558412405147354168704321026971710...

0.2089226676535433…

Alternate forms:

$$\sqrt[24]{\frac{77}{3\,203\,158\,846\,688\,198\,656} + \frac{3\sqrt{645}}{3\,203\,158\,846\,688\,198\,656}}$$

$$\frac{1}{2 \times 2^{17/24}\,\sqrt[24]{11\,747\left(77 - 3\sqrt{645}\right)}}$$

Minimal polynomial:

$$82\,743\,762\,879\,974\,765\,661\,427\,736\,630\,001\,664\,x^{48} - 3\,978\,116\,632\,177\,278\,976\,x^{24} + 1$$

Now, we obtain also:

(987-18)*colog(((((1/(((2)^1/4 * (2)^1/24)) * 1/(((2)^1/4 * (34*2)^1/24)) * 1/(((2)^1/4 * (((154+6*sqrt645)*2))^1/24)) * 1/(((2)^1/4 * (4*2)^1/24)) * 1/(((2)^1/4 * (2764*2)^1/24)))))))

Where 987 is a Fibonacci number and 18 is a Lucas number

Input:

$$(987-18)\left(-\log\left(\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{34\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{4\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2764\times 2}}\right)\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$-969\log\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)$$

Decimal approximation:

1728.941082144663417169561966684201877211254848111879753949...

1728.94108214….

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

Property:

$$-969\log\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\,(154+6\sqrt{645})}}\right)$$ is a transcendental number

Alternate forms:

$$\frac{323}{8}\left(41\log(2)+\log\left(11\,747\left(77+3\sqrt{645}\right)\right)\right)$$

$$\frac{13\,243\log(2)}{8}+\frac{323}{8}\log\left(11\,747\left(77+3\sqrt{645}\right)\right)$$

$$\frac{323}{8}\left(41\log(2)+\log(17)+\log(691)+\log\left(77+3\sqrt{645}\right)\right)$$

Alternative representations:

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=-969\log_e\left(\frac{1}{\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{8}\right)\left(\sqrt[4]{2}\ \sqrt[24]{68}\right)\left(\sqrt[4]{2}\ \sqrt[24]{5528}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=-969\log(a)\log_a\left(\frac{1}{\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{8}\right)\left(\sqrt[4]{2}\ \sqrt[24]{68}\right)\left(\sqrt[4]{2}\ \sqrt[24]{5528}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=969\,\mathrm{Li}_1\left(1-\frac{1}{\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{8}\right)\left(\sqrt[4]{2}\ \sqrt[24]{68}\right)\left(\sqrt[4]{2}\ \sqrt[24]{5528}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

Series representations:

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$969\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)^k}{k}$$

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$969\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{17/24}\sqrt[24]{11\,747\left(77+3\sqrt{645}\right)}}\right)^k}{k}$$

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$-1938\,i\,\pi\left\lfloor\frac{\arg\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11747\left(154+6\sqrt{645}\right)}}-x\right)}{2\pi}\right\rfloor-969\log(x)+969\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representation:

$$(987-18)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$-969\int_1^{\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}}\frac{1}{t}\,dt$$

We have also that:

1/13* (987-18)*colog(((((1/(((2)^1/4 * (2)^1/24)) *1/(((2)^1/4 * (34*2)^1/24)) *1/(((2)^1/4 *(((154+6*sqrt645)*2))^1/24)) * 1/(((2)^1/4 * (4*2)^1/24))* 1/(((2)^1/4*(2764*2)^1/24)))))))+2Pi

Input:

$$\frac{1}{13}(987-18)\left(-\log\left(\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{34\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{4\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2764\times 2}}\right)\right)+2\pi$$

log(x) is the natural logarithm

Exact result:

$$2\pi-\frac{969}{13}\log\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)$$

Decimal approximation:

139.2786531644613877976608226653437655538754809612025004072...

139.278653164…. result practically equal to the rest mass of Pion meson 139.57

Alternate forms:

$$2\pi + \frac{13\,243\log(2)}{104} + \frac{323}{104}\log\left(11\,747\left(77 + 3\sqrt{645}\right)\right)$$

$$2\pi + \frac{323}{104}\left(41\log(2) + \log\left(11\,747\left(77 + 3\sqrt{645}\right)\right)\right)$$

$$\frac{1}{104}\left(208\pi + 323\left(41\log(2) + \log(17) + \log(691) + \log\left(77 + 3\sqrt{645}\right)\right)\right)$$

Alternative representations:

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)\right) + 2\pi = 2\pi - \frac{969}{13}\log_e\left(\frac{1}{\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{8}\right)\left(\sqrt[4]{2}\ \sqrt[24]{68}\right)\left(\sqrt[4]{2}\ \sqrt[24]{5528}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)\right) + 2\pi = 2\pi - \frac{969}{13}\log(a)\log_a\left(\frac{1}{\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{8}\right)\left(\sqrt[4]{2}\ \sqrt[24]{68}\right)\left(\sqrt[4]{2}\ \sqrt[24]{5528}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)\right)+2\pi=2\pi+\frac{969}{13}\operatorname{Li}_1\left(1-\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

Series representations:

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)\right)+2\pi=2\pi+\frac{969}{13}\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)^k}{k}$$

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)\right)+2\pi=2\pi+\frac{969}{13}\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{17/24}\sqrt[24]{11\,747\left(77+3\sqrt{645}\right)}}\right)^k}{k}$$

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)\right)+2\pi =$$

$$2\pi-\frac{1938}{13}\,i\pi\left\lfloor\frac{\arg\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)}{2\pi}\right\rfloor-\frac{969\log(x)}{13}+\frac{969}{13}\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representation:

$$\frac{1}{13}(987-18)\left(-\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)\right)+2\pi=2\pi-\frac{969}{13}\int_1^{\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}}\frac{1}{t}\,dt$$

And:

(55+13+2)*colog(((((1/(((2)^1/4 * (2)^1/24)) * 1/(((2)^1/4 * (34*2)^1/24)) * 1/(((2)^1/4 * (((154+6*sqrt645)*2))^1/24)) * 1/(((2)^1/4 * (4*2)^1/24)) * 1/(((2)^1/4 * (2764*2)^1/24)))))))

Where 55, 13 and 2 are Fibonacci numbers

Input:

$$(55+13+2)\left(-\log\left(\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{34\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{4\times 2}}\times\frac{1}{\sqrt[4]{2}\ \sqrt[24]{2764\times 2}}\right)\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$-70\log\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)$$

Decimal approximation:

124.897704592493745306366705539622426630328007603541365094 3...

124.897704592… 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

Property:

$$-70\log\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\,(154+6\sqrt{645})}}\right) \text{ is a transcendental number}$$

Alternate forms:

$$\frac{35}{12}\left(41\log(2)+\log\left(11\,747\left(77+3\sqrt{645}\right)\right)\right)$$

$$\frac{1435\log(2)}{12}+\frac{35}{12}\log\left(11\,747\left(77+3\sqrt{645}\right)\right)$$

$$\frac{35}{12}\left(41\log(2)+\log(17)+\log(691)+\log\left(77+3\sqrt{645}\right)\right)$$

Alternative representations:

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right) = -70\log_e\left(\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right) = -70\log(a)\log_a\left(\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right) = 70\operatorname{Li}_1\left(1-\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)$$

Series representations:

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right) = 70\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)^k}{k}$$

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$70\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{17/24}\sqrt[24]{11\,747\left(77+3\sqrt{645}\right)}}\right)^k}{k}$$

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$-140\,i\,\pi\left\lfloor\frac{\arg\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)}{2\,\pi}\right\rfloor-70\log(x)+$$

$$70\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representation:

$$(55+13+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\ \sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\ \sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\ \sqrt[24]{2764\times 2}\right)\right)\right)\right)=$$

$$-70\int_1^{\frac{1}{2\times 2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}}\frac{1}{t}\,dt$$

And also:

(76+2)*colog(((((1/(((2)^1/4 * (2)^1/24)) *1/(((2)^1/4 * (34*2)^1/24)) * 1/ (((2)^1/4 *(((154+6*sqrt645)*2))^1/24))* 1/(((2)^1/4 *(4*2)^1/24))*1/(((2)^1/4 * (2764*2)^1/24)))))))+1/golden ratio

Where 76 and 2 are Lucas numbers

Input:

$$(76+2)\left(-\log\left(\frac{1}{\sqrt[4]{2}\,\sqrt[24]{2}}\times\frac{1}{\sqrt[4]{2}\,\sqrt[24]{34\times2}}\times\frac{1}{\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)\times2}}\times\frac{1}{\sqrt[4]{2}\,\sqrt[24]{4\times2}}\times\frac{1}{\sqrt[4]{2}\,\sqrt[24]{2764\times2}}\right)\right)+\frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi}-78\log\left(\frac{1}{2\times2^{2/3}\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)$$

Decimal approximation:

139.7897619632429253324417730070877706486572319380375696816...

139.789761963…. result practically equal to the rest mass of Pion meson 139.57

Property:

$$\frac{1}{\phi}-78\log\left(\frac{1}{2\times2^{2/3}\sqrt[24]{11\,747\,(154+6\sqrt{645})}}\right)$$ is a transcendental number

Alternate forms:

$$\frac{1}{\phi}+\frac{533\log(2)}{4}+\frac{13}{4}\log\left(11\,747\left(77+3\sqrt{645}\right)\right)$$

$$\frac{1}{\phi}+\frac{13}{4}\left(41\log(2)+\log\left(11\,747\left(77+3\sqrt{645}\right)\right)\right)$$

$$\frac{13\,\phi\left(41\log(2)+\log(17)+\log(691)+\log\left(77+3\sqrt{645}\right)\right)+4}{4\,\phi}$$

Alternative representations:

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+\frac{1}{\phi}=-78\log_e\left(\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)+\frac{1}{\phi}$$

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+\frac{1}{\phi}=-78\log(a)\log_a\left(\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)+\frac{1}{\phi}$$

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+\frac{1}{\phi}=78\,\mathrm{Li}_1\left(1-\frac{1}{\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{8}\right)\left(\sqrt[4]{2}\,\sqrt[24]{68}\right)\left(\sqrt[4]{2}\,\sqrt[24]{5528}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2\left(154+6\sqrt{645}\right)}\right)}\right)+\frac{1}{\phi}$$

Series representations:

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+\frac{1}{\phi}=\frac{1}{\phi}+78\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{2/3}\,\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}\right)^k}{k}$$

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+\frac{1}{\phi}=$$

$$\frac{1}{\phi}+78\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{2\times 2^{17/24}\,\sqrt[24]{11\,747\left(77+3\sqrt{645}\right)}}\right)^k}{k}$$

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-156\,i\,\pi\left\lfloor\frac{\arg\left(\frac{1}{2\times 2^{2/3}\,\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)}{2\pi}\right\rfloor-78\log(x)+$$

$$78\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{1}{2\times 2^{2/3}\,\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representation:

$$(76+2)(-1)\log\left(1\Big/\left(\left(\sqrt[4]{2}\,\sqrt[24]{34\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{\left(154+6\sqrt{645}\right)2}\right)\left(\left(\sqrt[4]{2}\,\sqrt[24]{4\times 2}\right)\left(\sqrt[4]{2}\,\sqrt[24]{2764\times 2}\right)\right)\right)\right)+$$

$$\frac{1}{\phi}=\frac{1}{\phi}-78\int_1^{\frac{1}{2\times 2^{2/3}\,\sqrt[24]{11\,747\left(154+6\sqrt{645}\right)}}}\frac{1}{t}\,dt$$

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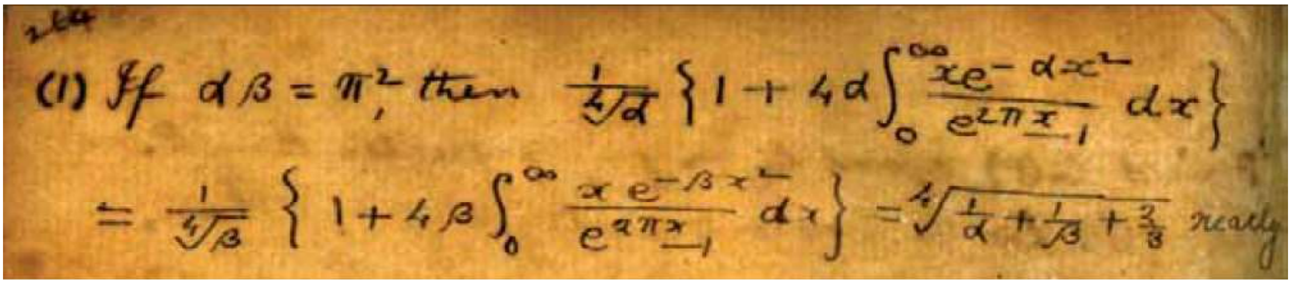

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(1) If $\alpha\beta = \pi^2$, then $\frac{1}{\sqrt[4]{\alpha}}\left\{1+4\alpha\int_0^\infty \frac{xe^{-\alpha x^2}}{e^{2\pi x}-1}dx\right\}$

$= \frac{1}{\sqrt[4]{\beta}}\left\{1+4\beta\int_0^\infty \frac{xe^{-\beta x^2}}{e^{2\pi x}-1}dx\right\} = \sqrt[4]{\frac{1}{\alpha}+\frac{1}{\beta}+\frac{2}{3}}$ nearly

For α = π and β = π, we obtain:

(((1/Pi + 1/Pi + 2/3)^1/4))

Input:

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}$$

Exact result:

$$\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}$$

Decimal approximation:

1.068464184825644425897574377964239345880285534736675925161...

1.06846418482….

Property:

$\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}$ is a transcendental number

Alternate form:

$$\sqrt[4]{\frac{2(3+\pi)}{3\pi}}$$

All 4th roots of 2/3 + 2/π:

$\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}\ e^0 \approx 1.06846$ (real, principal root)

$\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}\ e^{(i\pi)/2} \approx 1.06846\, i$

$\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}\ e^{i\pi} \approx -1.0685$ (real root)

$$\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}\; e^{-(i\pi)/2} \approx -1.0685\, i$$

Alternative representations:

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+\frac{2}{180\,°}}$$

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+-\frac{2}{i\log(-1)}}$$

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+\frac{2}{\cos^{-1}(-1)}}$$

Series representations:

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+\frac{1}{2\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}}$$

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

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

Integral representations:

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+\frac{1}{\int_0^{\infty}\frac{1}{1+t^2}\,dt}}$$

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+\frac{1}{\int_0^{1}\frac{1}{\sqrt{1-t^2}}\,dt}}$$

$$\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}} = \sqrt[4]{\frac{2}{3}+\frac{1}{\int_0^{\infty}\frac{\sin(t)}{t}\,dt}}$$

We have that:

(((1/(((1/Pi + 1/Pi + 2/3)^1/4)))))^1/8

Input:

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}}$$

Exact result:

$$\frac{1}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}}$$

Decimal approximation:

0.99175638200632333178055688658545850743408368303596107424 3...

0.99175638200632….. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Property:

$\frac{1}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}}$ is a transcendental number

Alternate form:

$$\sqrt[32]{\frac{3\pi}{2(3+\pi)}}$$

All 8th roots of 1/(2/3 + 2/π)^(1/4):

$$\frac{e^0}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}} \approx 0.991756 \quad \text{(real, principal root)}$$

$$\frac{e^{(i\pi)/4}}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}} \approx 0.70128+0.70128\,i$$

$$\frac{e^{(i\pi)/2}}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}} \approx 0.991756\,i$$

$$\frac{e^{(3i\pi)/4}}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}} \approx -0.7013+0.70128\,i$$

$$\frac{e^{i\pi}}{\sqrt[32]{\frac{2}{3}+\frac{2}{\pi}}} \approx -0.9918 \quad \text{(real root)}$$

Alternative representations:

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \sqrt[8]{\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{180\,^\circ}}}}$$

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \sqrt[8]{\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\cos^{-1}(-1)}}}}$$

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \sqrt[8]{\frac{1}{\sqrt[4]{\frac{2}{3}+-\frac{2}{i\log(-1)}}}}$$

Series representations:

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \frac{1}{\sqrt[32]{\frac{2}{3}+\frac{1}{2\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}}}$$

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \frac{1}{\sqrt[32]{\frac{2}{3}+\frac{2}{\sum_{k=0}^{\infty} -\frac{4(-1)^k 1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}}}}$$

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \frac{1}{\sqrt[32]{\frac{2}{3}+\frac{2}{\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{2}{1+4k}+\frac{2}{2+4k}+\frac{1}{3+4k}\right)}}}$$

Integral representations:

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \frac{1}{\sqrt[32]{\frac{2}{3}+\frac{1}{\int_0^{\infty}\frac{1}{1+t^2}\,dt}}}$$

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \frac{1}{\sqrt[32]{\frac{2}{3}+\frac{1}{\int_0^{1}\frac{1}{\sqrt{1-t^2}}\,dt}}}$$

$$\sqrt[8]{\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}} = \frac{1}{\sqrt[32]{\frac{2}{3}+\frac{1}{\int_0^{\infty}\frac{\sin(t)}{t}\,dt}}}$$

16*log base 0.99175638200632 (((1/(((1/Pi + 1/Pi + 2/3)^1/4)))))-Pi+1/golden ratio

Input interpretation:

$$16\log_{0.99175638200632}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)-\pi+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.476441335...

125.476441335… 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:

$$16 \log_{0.991756382006320000}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+\frac{1}{\phi}+\frac{16 \log\left(\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right)}{\log(0.991756382006320000)}$$

Series representations:

$$16 \log_{0.991756382006320000}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi-\frac{16 \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1+\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right)^k}{k}}{\log(0.991756382006320000)}$$

$$16 \log_{0.991756382006320000}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)-\pi+\frac{1}{\phi}=\frac{1.000000000000000}{\phi}-$$

$$1.000000000000000\,\pi-1932.895370487383 \log\left(\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right)-$$

$$16.00000000000000 \log\left(\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right) \sum_{k=0}^{\infty}(-0.008243617993680000)^k\, G(k)$$

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

16*log base 0.99175638200632 (((1/(((1/Pi + 1/Pi + 2/3)^1/4)))))+11+1/golden ratio

Input interpretation:

$$16\log_{0.99175638200632}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618033989...

139.618033989… result practically equal to the rest mass of Pion meson 139.57

Alternative representation:

$$16\log_{0.991756382006320000}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}+\frac{16\log\left(\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right)}{\log(0.991756382006320000)}$$

Series representations:

$$16\log_{0.991756382006320000}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-\frac{16\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right)^k}{k}}{\log(0.991756382006320000)}$$

$$16 \log_{0.991756382006320000}\left(\frac{1}{\sqrt[4]{\frac{1}{\pi}+\frac{1}{\pi}+\frac{2}{3}}}\right)+11+\frac{1}{\phi} = 11.00000000000000 +$$

$$\frac{1.000000000000000}{\phi} - 1932.895370487383 \log\left(\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right) -$$

$$16.00000000000000 \log\left(\frac{1}{\sqrt[4]{\frac{2}{3}+\frac{2}{\pi}}}\right)\sum_{k=0}^{\infty}(-0.008243617993680000)^k\, G(k)$$

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

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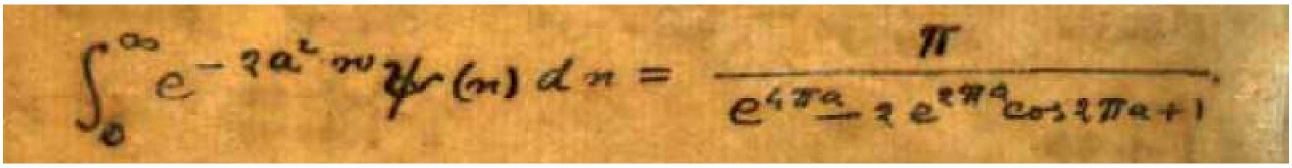

$$\int_0^\infty e^{-2a^2 x}\psi(x)\,dx = \frac{\pi}{e^{4\pi a}-2e^{2\pi a}\cos 2\pi a+1}$$

For a = 2

Pi/(((((e^(4Pi*2)-2e^(2Pi*2) cos 2Pi*2 + 1)))))

Input:

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

Exact result:

$$\frac{\pi}{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}$$

Decimal approximation:

$3.8205960455703698361853758638851220368411091340758333\ldots\times 10^{-11}$

$3.82059604557036\ldots{*}10^{-11}$

Alternate forms:

$$-\frac{\pi}{-1-e^{8\pi}+4\,e^{4\pi}\,\pi\cos(2)}$$

$$\frac{\pi}{1+e^{8\pi}-2\left(e^{-2i}+e^{2i}\right)e^{4\pi}\,\pi}$$

Alternative representations:

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1-4\pi\cosh(-2\,i)\,e^{4\pi}+e^{8\pi}}$$

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}-\frac{4\pi e^{4\pi}}{\sec(2)}}$$

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1-4\pi\cosh(2\,i)\,e^{4\pi}+e^{8\pi}}$$

Series representations:

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}-4\,e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{(-4)^k}{(2k)!}}$$

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}+4\,e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{(-1)^k\left(2-\frac{\pi}{2}\right)^{1+2k}}{(1+2k)!}}$$

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}-4\,e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{\cos\left(\frac{k\pi}{2}+z_0\right)(2-z_0)^k}{k!}}$$

Integral representations:

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}+4\,e^{4\pi}\,\pi\left(-1+2\int_0^1\sin(2\,t)\,dt\right)}$$

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}+2\,i\,e^{4\pi}\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-1/s+s}}{\sqrt{s}}\,ds}\quad\text{for }\gamma>0$$

$$\frac{\pi}{e^{4\pi 2}-(\cos(2)\,\pi\,2)\,2\,e^{2\pi 2}+1}=\frac{\pi}{1+e^{8\pi}+2\,i\,e^{4\pi}\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}\,ds}\quad\text{for }0<\gamma<\frac{1}{2}$$

sqrt[1/10^10 * 1/(((Pi/(((((e^(4Pi*2)-2e^(2Pi*2) cos 2Pi*2 + 1))))))))]

Input:

$$\sqrt{\frac{1}{10^{10}} \times \frac{1}{\frac{\pi}{e^{4\pi\times 2}-\left(2\,e^{2\pi\times 2}\right)(\cos(2)\,\pi\times 2)+1}}}$$

Exact result:

$$\frac{\sqrt{\frac{1+e^{8\pi}-4\,e^{4\pi}\,\pi\cos(2)}{\pi}}}{100\,000}$$

Decimal approximation:

1.617835791367246766261901145284736113702929252494221307447...

1.61783579136724676….. result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternate form:

$$\frac{\sqrt{\frac{1+e^{8\pi}-2\left(e^{-2i}+e^{2i}\right)e^{4\pi}\,\pi}{\pi}}}{100\,000}$$

All 2nd roots of (1 + e^(8 π) - 4 e^(4 π) π cos(2))/(10000000000 π):

$$\frac{e^{0}\sqrt{\frac{1+e^{8\pi}-4\,e^{4\pi}\,\pi\cos(2)}{\pi}}}{100\,000} \approx 1.618 \quad \text{(real, principal root)}$$

$$\frac{e^{i\pi}\sqrt{\frac{1+e^{8\pi}-4\,e^{4\pi}\,\pi\cos(2)}{\pi}}}{100\,000} \approx -1.618 \quad \text{(real root)}$$

Alternative representations:

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}} = \sqrt{\frac{1}{\frac{10^{10}\,\pi}{1-4\,\pi\cosh(-2\,i)\,e^{4\pi}+e^{8\pi}}}}$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}} = \sqrt{\frac{1}{\frac{10^{10}\,\pi}{1+e^{8\pi}-\frac{4\,\pi\,e^{4\pi}}{\sec(2)}}}}$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\sqrt{\frac{1}{\frac{10^{10}\,\pi}{1-4\,\pi\cosh(2\,i)\,e^{4\pi}+e^{8\pi}}}}$$

Series representations:

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}-4\,e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{(-4)^k}{(2\,k)!}}}{100\,000\,\sqrt{\pi}}$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}+4\,e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{(-1)^k\left(2-\frac{\pi}{2}\right)^{1+2\,k}}{(1+2\,k)!}}}{100\,000\,\sqrt{\pi}}$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}-4\,e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{\cos\left(\frac{k\,\pi}{2}+z_0\right)(2-z_0)^k}{k!}}}{100\,000\,\sqrt{\pi}}$$

Integral representations:

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}+4\,e^{4\pi}\,\pi\int_{\frac{\pi}{2}}^{2}\sin(t)\,dt}}{100\,000\,\sqrt{\pi}}$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}-4\,e^{4\pi}\,\pi\left(1-2\int_0^1\sin(2\,t)\,dt\right)}}{100\,000\,\sqrt{\pi}}$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}+2\,i\,e^{4\pi}\,\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1/s+s}}{\sqrt{s}}\,ds}}{100\,000\,\sqrt{\pi}}\quad\text{for }\gamma>0$$

$$\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}=\frac{\sqrt{1+e^{8\pi}+2\,i\,e^{4\pi}\,\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}\,ds}}{100\,000\,\sqrt{\pi}}\quad\text{for }0<\gamma<\frac{1}{2}$$

And:

1/10^27 * ((((47+7)/10^3 + sqrt[1/10^10 * 1/(((Pi/(((((e^(4Pi*2)-2e^(2Pi*2) cos 2Pi*2 + 1))))))))])))

Where 47 and 7 are Lucas number

Input:

$$\frac{1}{10^{27}}\left(\frac{47+7}{10^3}+\sqrt{\frac{1}{10^{10}}\times\frac{1}{\frac{\pi}{e^{4\pi\times2}-\left(2e^{2\pi\times2}\right)(\cos(2)\pi\times2)+1}}}\right)$$

Exact result:

$$\frac{\frac{27}{500}+\frac{\sqrt{\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{\pi}}}{100\,000}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Decimal approximation:

$$1.6718357913672467662619011452847361137029292524942213\ldots\times10^{-27}$$

$1.671835791367\ldots*10^{-27}$ result practically equal to the proton mass

Alternate forms:

$$\frac{5400+\sqrt{\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{\pi}}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{\pi}}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{\frac{1+e^{8\pi}-2\left(e^{-2i}+e^{2i}\right)e^{4\pi}\pi}{\pi}}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Alternative representations:

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}{10^{27}}=\frac{\frac{54}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{1-4\pi\cosh(-2i)e^{4\pi}+e^{8\pi}}}}}{10^{27}}$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}{10^{27}}=\frac{\frac{54}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{1+e^{8\pi}-\frac{4\pi e^{4\pi}}{\sec(2)}}}}}{10^{27}}$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}{10^{27}}=\frac{\frac{54}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{1-4\pi\cosh(2i)e^{4\pi}+e^{8\pi}}}}}{10^{27}}$$

Series representations:

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}-4e^{4\pi}\pi\sum_{k=0}^{\infty}\frac{(-4)^k}{(2k)!}}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\sqrt{\pi}}$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}+4e^{4\pi}\pi\sum_{k=0}^{\infty}\frac{(-1)^k\left(2-\frac{\pi}{2}\right)^{1+2k}}{(1+2k)!}}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\sqrt{\pi}}$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\pi}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}-4e^{4\pi}\pi\sum_{k=0}^{\infty}\frac{\cos\left(\frac{k\pi}{2}+z_0\right)(2-z_0)^k}{k!}}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\sqrt{\pi}}$$

Integral representations:

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\,\pi}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}+4\,e^{4\pi}\,\pi\int_{\frac{\pi}{2}}^{2}\sin(t)\,dt}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{\pi}}$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\,\pi}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}-4\,e^{4\pi}\,\pi\left(1-2\int_{0}^{1}\sin(2\,t)\,dt\right)}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{\pi}}$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\,\pi}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}+2\,i\,e^{4\pi}\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1/s+s}}{\sqrt{s}}\,ds}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{\pi}}\quad\text{for }\gamma>0$$

$$\frac{\frac{47+7}{10^3}+\sqrt{\frac{1}{\frac{10^{10}\,\pi}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}}{10^{27}}=\frac{27}{500\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{\sqrt{1+e^{8\pi}+2\,i\,e^{4\pi}\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}\,ds}}{100\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\sqrt{\pi}}\quad\text{for }0<\gamma<\frac{1}{2}$$

(((1/sqrt[1/10^10 * 1/(((Pi/(((((e^(4Pi*2)-2e^(2Pi*2) cos 2Pi*2 + 1))))))))]))))^1/64

Input:

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{10^{10}}\times\frac{1}{\frac{\pi}{e^{4\pi\times 2}-\left(2\,e^{2\pi\times 2}\right)(\cos(2)\,\pi\times 2)+1}}}}}$$

Exact result:

$$10^{5/64}\sqrt[128]{\frac{\pi}{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}}$$

Decimal approximation:

0.992511161440058542133772227339081712370522859827805684454...

0.99251116144… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate form:

$$10^{5/64}\sqrt[128]{\frac{\pi}{1+e^{8\pi}-2\left(e^{-2i}+e^{2i}\right)e^{4\pi}\pi}}$$

Series representations:

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}}=10^{5/64}\sqrt[128]{\pi}\sqrt[128]{\frac{1}{1+e^{8\pi}-4e^{4\pi}\pi\sum_{k=0}^{\infty}\frac{(-4)^k}{(2k)!}}}$$

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}}=$$

$$10^{5/64}\sqrt[128]{\pi}\sqrt[128]{\frac{1}{1+e^{8\pi}-4e^{4\pi}\pi\left(J_0(2)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(2)\right)}}$$

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2\, e^{2\pi 2}\right)(\cos(2)\,\pi\, 2)+1}}}}} =$$

$$10^{5/64}\sqrt[128]{\pi}\,\sqrt[128]{\frac{1}{1+e^{8\pi}+4\, e^{4\pi}\,\pi\sum_{k=0}^{\infty}\frac{(-1)^k\left(2-\frac{\pi}{2}\right)^{1+2k}}{(1+2k)!}}}$$

Integral representations:

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2\, e^{2\pi 2}\right)(\cos(2)\,\pi\, 2)+1}}}}} = 10^{5/64}\sqrt[128]{\pi}\,\sqrt[128]{\frac{1}{1+e^{8\pi}+4\, e^{4\pi}\,\pi\int_{\frac{\pi}{2}}^{2}\sin(t)\,dt}}$$

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2\, e^{2\pi 2}\right)(\cos(2)\,\pi\, 2)+1}}}}} = 10^{5/64}\sqrt[128]{\pi}\,\sqrt[128]{\frac{1}{1+e^{8\pi}-4\, e^{4\pi}\,\pi\left(1-2\int_0^1\sin(2\,t)\,dt\right)}}$$

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2\, e^{2\pi 2}\right)(\cos(2)\,\pi\, 2)+1}}}}} =$$

$$10^{5/64}\sqrt[128]{\pi}\,\sqrt[128]{\frac{1}{1+e^{8\pi}+2\, i\, e^{4\pi}\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1/s+s}}{\sqrt{s}}\,ds}} \quad \text{for } \gamma > 0$$

$$\sqrt[64]{\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2\, e^{2\pi 2}\right)(\cos(2)\,\pi\, 2)+1}}}}} = 10^{5/64}\sqrt[128]{\pi}\,\sqrt[128]{\frac{1}{1+e^{8\pi}+2\, i\, e^{4\pi}\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}\,ds}}$$

$$\text{for } 0 < \gamma < \frac{1}{2}$$

2log base 0.99251116144(((1/sqrt[1/10^10 * 1/(((Pi/((((((e^(4Pi*2)-2e^(2Pi*2) cos 2Pi*2 + 1))))))))]))))-Pi+1/golden ratio

Input interpretation:

$$2\log_{0.99251116144}\left(\frac{1}{\sqrt{\frac{1}{10^{10}}\times\frac{1}{\frac{\pi}{e^{4\pi\times2}-\left(2e^{2\pi\times2}\right)(\cos(2)\pi\times2)+1}}}}\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476441...

125.476441… 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 representations:

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2e^{2\pi\,2}\right)(\cos(2)\pi\,2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+\frac{1}{\phi}+\frac{2\log\left(\frac{1}{\sqrt{\frac{1}{\frac{10^{10}\,\pi}{1-4\pi\cos(2)e^{4\pi}+e^{8\pi}}}}}\right)}{\log(0.992511161440000)}$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi\,2}-\left(2e^{2\pi\,2}\right)(\cos(2)\pi\,2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{10^{10}\,\pi}{1-4\pi\cosh(-2i)e^{4\pi}+e^{8\pi}}}}}\right)+\frac{1}{\phi}$$

$$2 \log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\, 10^{10}}}{e^{4\pi\, 2}-\left(2 e^{2\pi\, 2}\right)(\cos(2)\pi\, 2)+1}}}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+2 \log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{10^{10}\pi}}{1-4\pi\cosh(2 i) e^{4\pi}+e^{8\pi}}}}\right)+\frac{1}{\phi}$$

$$2 \log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\, 10^{10}}}{e^{4\pi\, 2}-\left(2 e^{2\pi\, 2}\right)(\cos(2)\pi\, 2)+1}}}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+2 \log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{10^{10}\pi}}{1-2\pi\left(e^{-2 i}+e^{2 i}\right) e^{4\pi}+e^{8\pi}}}}\right)+\frac{1}{\phi}$$

Series representations:

$$2 \log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\, 10^{10}}}{e^{4\pi\, 2}-\left(2 e^{2\pi\, 2}\right)(\cos(2)\pi\, 2)+1}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{\sqrt{\frac{1+e^{8\pi}-4 e^{4\pi}\pi\cos(2)}{10000000000\pi}}}\right)^k}{k}}{\log(0.992511161440000)}$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\log_{0.992511161440000}\left(1\Bigg/\left(\exp\left(i\pi\left\lfloor\frac{\arg\left(-x+\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\text{ for }(x\in\mathbb{R}\text{ and }x<0)$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\log_{0.992511161440000}\left(\frac{\left(\frac{1}{z_0}\right)^{-1/2\left\lfloor\arg\left(\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}-z_0\right)/(2\pi)\right\rfloor}z_0^{1/2\left(-1-\left\lfloor\arg\left(\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}-z_0\right)/(2\pi)\right\rfloor\right)}}{\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}-z_0\right)^k z_0^{-k}}{k!}}\right)$$

Integral representations:

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\,10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}+4e^{4\pi}\pi\left(-1+2\int_0^1\sin(2t)\,dt\right)}{10\,000\,000\,000\,\pi}}}\right)$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi 10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}+4e^{4\pi}\pi\int_{\frac{\pi}{2}}^{2}\sin(t)\,dt}{10000000000\pi}}}\right)$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi 10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}-\frac{2e^{4\pi}\sqrt{\pi}}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\mathcal{A}^{-1/s+s}}{\sqrt{s}}\,ds}{10000000000\pi}}}\right)\quad \text{for } \gamma>0$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi 10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}-\frac{2e^{4\pi}\sqrt{\pi}}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}\,ds}{10000000000\pi}}}\right)\quad \text{for } 0<\gamma<\frac{1}{2}$$

2log base 0.99251116144(((1/sqrt[1/10^10 * 1/(((Pi/(((((e^(4Pi*2)-2e^(2Pi*2) cos 2Pi*2 + 1))))))))]))))+11+1/golden ratio

Input interpretation:

$$2\log_{0.99251116144}\left(\frac{1}{\sqrt{\frac{1}{10^{10}}\times\frac{1}{\frac{\pi}{e^{4\pi\times2}-\left(2e^{2\pi\times2}\right)(\cos(2)\pi\times2)+1}}}}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618034...

139.618034… result practically equal to the rest mass of Pion meson 139.57

Alternative representations:

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi\,2}-\left(2e^{2\pi\,2}\right)(\cos(2)\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\frac{2\log\left(\frac{1}{\sqrt{\frac{\frac{1}{10^{10}\,\pi}}{1-4\pi\cos(2)e^{4\pi}+e^{8\pi}}}}\right)}{\log(0.992511161440000)}$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi\,2}-\left(2e^{2\pi\,2}\right)(\cos(2)\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{10^{10}\,\pi}}{1-4\pi\cosh(-2i)e^{4\pi}+e^{8\pi}}}}\right)+\frac{1}{\phi}$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{10^{10}\,\pi}}{1-4\,\pi\cosh(2\,i)\,e^{4\,\pi}+e^{8\,\pi}}}}\right)+\frac{1}{\phi}$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{10^{10}\,\pi}}{1-2\,\pi\left(e^{-2\,i}+e^{2\,i}\right)e^{4\,\pi}+e^{8\,\pi}}}}\right)+\frac{1}{\phi}$$

Series representations:

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi\,2}-\left(2\,e^{2\pi\,2}\right)(\cos(2)\,\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{1}{\sqrt{\frac{1+e^{8\,\pi}-4\,e^{4\,\pi}\,\pi\cos(2)}{10000000000\,\pi}}}\right)^k}{k}}{\log(0.992511161440000)}$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\log_{0.992511161440000}\left(1\Bigg/\left(\exp\left(i\pi\left\lfloor\frac{\arg\left(-x+\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\log_{0.992511161440000}\left(\frac{\left(\frac{1}{z_0}\right)^{-1/2\left\lfloor\arg\left(\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(-1-\left\lfloor\arg\left(\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}-z_0\right)/(2\pi)\right\rfloor\right)}}{\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{1+e^{8\pi}-4e^{4\pi}\pi\cos(2)}{10\,000\,000\,000\,\pi}-z_0\right)^k z_0^{-k}}{k!}}\right)$$

Integral representations:

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1}{\frac{\pi\, 10^{10}}{e^{4\pi 2}-\left(2e^{2\pi 2}\right)(\cos(2)\pi 2)+1}}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}+4e^{4\pi}\pi\left(-1+2\int_0^1\sin(2t)\,dt\right)}{10\,000\,000\,000\,\pi}}}\right)$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi 2}-\left(2\,e^{2\pi 2}\right)(\cos(2)\,\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}+4\,e^{4\pi}\,\pi\int_{\frac{\pi}{2}}^{2}\sin(t)\,dt}{10000000000\,\pi}}}\right)$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi 2}-\left(2\,e^{2\pi 2}\right)(\cos(2)\,\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}-\frac{2\,e^{4\pi}\sqrt{\pi}}{i}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\mathcal{A}^{-1/s+s}}{\sqrt{s}}\,ds}{10000000000\,\pi}}}\right)\quad\text{for }\gamma>0$$

$$2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{\frac{1}{\pi\,10^{10}}}{e^{4\pi 2}-\left(2\,e^{2\pi 2}\right)(\cos(2)\,\pi\,2)+1}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+2\log_{0.992511161440000}\left(\frac{1}{\sqrt{\frac{1+e^{8\pi}-\frac{2\,e^{4\pi}\sqrt{\pi}}{i}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}\,ds}{10000000000\,\pi}}}\right)\quad\text{for }0<\gamma<\frac{1}{2}$$

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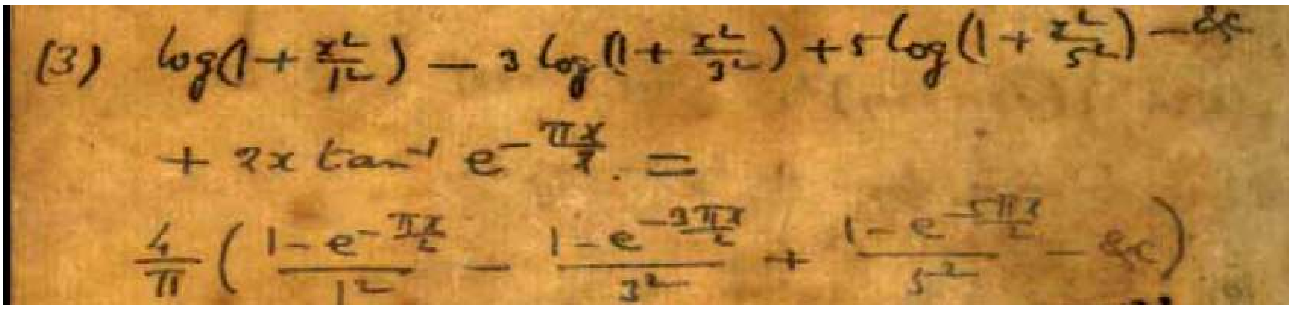

$$(3)\quad \log\left(1+\frac{x^2}{1^2}\right) - 3\log\left(1+\frac{x^2}{3^2}\right) + 5\log\left(1+\frac{x^2}{5^2}\right) - \&c$$
$$+ 2x\tan^{-1} e^{-\frac{\pi x}{2}} =$$
$$\frac{4}{\pi}\left(\frac{1-e^{-\frac{\pi x}{2}}}{1^2} - \frac{1-e^{-\frac{3\pi x}{2}}}{3^2} + \frac{1-e^{-\frac{5\pi x}{2}}}{5^2} - \&c\right)$$

(4/Pi)*[(((1-exp-(((1*(2Pi)/2)))))/1^2)))-(((1-exp-(((3*2Pi)/2)))))/3^2)))+(((1-exp-(((5*2Pi)/2)))))/5^2)]

Input:

$$\frac{4}{\pi}\left(\frac{1-\exp\left(-\left(1\times\frac{2\pi}{2}\right)\right)}{1^2} - \frac{1-\exp\left(-\left(\frac{1}{2}(3\times 2\pi)\right)\right)}{3^2} + \frac{1-\exp\left(-\left(\frac{1}{2}(5\times 2\pi)\right)\right)}{5^2}\right)$$

Exact result:

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(e^{-3\pi}-1\right)\right)}{\pi}$$

Decimal approximation:

1.127687805353210754479544108095192580170402923803231305534...

1.12768780535….

Alternate forms:

$$\frac{836-36e^{-5\pi}+100e^{-3\pi}-900e^{-\pi}}{225\pi}$$

$$-\frac{4\left(-209+9e^{-5\pi}-25e^{-3\pi}+225e^{-\pi}\right)}{225\pi}$$

$$\frac{836-4e^{-5\pi}\left(9-25e^{2\pi}+225e^{4\pi}\right)}{225\pi}$$

Series representations:

$$\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}=\frac{1}{225\pi}4\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-5\pi}\left(-1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\pi}\right)\left(9+9\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\pi}-16\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{2\pi}-16\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{3\pi}+209\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{4\pi}\right)$$

$$\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}=\frac{1}{225\pi}4\left(-1+\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\pi}\right)\left(9+9\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\pi}-16\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{2\pi}-16\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{3\pi}+209\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{4\pi}\right)\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{-5\pi}$$

$$\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}=\frac{1}{225\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}e^{-20\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\left(-1+e^{\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)\left(1+e^{\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)\left(1+e^{2\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)\left(9+9e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-16e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-16e^{12\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+209e^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)$$

Integral representations:

$$\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}=\frac{1}{225\int_0^{\infty}\frac{\sin(t)}{t}\,dt}2e^{-10\int_0^{\infty}\sin(t)/t\,dt}\left(-1+e^{\int_0^{\infty}\sin(t)/t\,dt}\right)\left(1+e^{\int_0^{\infty}\sin(t)/t\,dt}\right)\left(9+9e^{2\int_0^{\infty}\sin(t)/t\,dt}-16e^{4\int_0^{\infty}\sin(t)/t\,dt}-16e^{6\int_0^{\infty}\sin(t)/t\,dt}+209e^{8\int_0^{\infty}\sin(t)/t\,dt}\right)$$

$$\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}=$$

$$\frac{1}{225\int_0^\infty \frac{1}{1+t^2}\,dt}\,2\,e^{-10\int_0^\infty 1/(1+t^2)\,dt}\left(-1+e^{\int_0^\infty 1/(1+t^2)\,dt}\right)\left(1+e^{\int_0^\infty 1/(1+t^2)\,dt}\right)$$
$$\left(9+9\,e^{2\int_0^\infty 1/(1+t^2)\,dt}-16\,e^{4\int_0^\infty 1/(1+t^2)\,dt}-16\,e^{6\int_0^\infty 1/(1+t^2)\,dt}+209\,e^{8\int_0^\infty 1/(1+t^2)\,dt}\right)$$

$$\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}=\frac{1}{225\int_0^\infty \frac{\sin^2(t)}{t^2}\,dt}$$
$$2\,e^{-10\int_0^\infty \sin^2(t)/t^2\,dt}\left(-1+e^{\int_0^\infty \sin^2(t)/t^2\,dt}\right)\left(1+e^{\int_0^\infty \sin^2(t)/t^2\,dt}\right)$$
$$\left(9+9\,e^{2\int_0^\infty \sin^2(t)/t^2\,dt}-16\,e^{4\int_0^\infty \sin^2(t)/t^2\,dt}-16\,e^{6\int_0^\infty \sin^2(t)/t^2\,dt}+209\,e^{8\int_0^\infty \sin^2(t)/t^2\,dt}\right)$$

1/ (((((4/Pi)*[(((1-exp-(((1*(2Pi)/2)))))/1^2))-(((1-exp-(((3*2Pi)/2)))))/3^2))+(((1-exp-(((5*2Pi)/2)))))/5^2)]))))^1/16

Input:

$$\frac{1}{\sqrt[16]{\frac{4}{\pi}\left(\frac{1-\exp\left(-\left(1\times\frac{2\pi}{2}\right)\right)}{1^2}-\frac{1-\exp\left(-\left(\frac{1}{2}(3\times 2\pi)\right)\right)}{3^2}+\frac{1-\exp\left(-\left(\frac{1}{2}(5\times 2\pi)\right)\right)}{5^2}\right)}}$$

Exact result:

$$\frac{\sqrt[16]{\frac{\pi}{1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(e^{-3\pi}-1\right)}}}{\sqrt[8]{2}}$$

Decimal approximation:

0.9925175498049155703224983203835896471623733975500354538 42...

0.9925175498…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate forms:

$$\sqrt[8]{\frac{15}{2}}\ \sqrt[16]{\frac{\pi}{209-9e^{-5\pi}+25e^{-3\pi}-225e^{-\pi}}}$$

$$\sqrt[8]{\frac{15}{2}}\ e^{(5\pi)/16}\ \sqrt[16]{\frac{\pi}{-9+25e^{2\pi}-225e^{4\pi}+209e^{5\pi}}}$$

Series representations:

$$\frac{1}{\sqrt[16]{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}}=$$

$$\sqrt[8]{\frac{15}{2}}\ \sqrt[16]{\pi}\ \sqrt[16]{\frac{\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{5\pi}}{-9+25\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{2\pi}-225\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{4\pi}+209\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{5\pi}}}$$

$$\frac{1}{\sqrt[16]{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}}=\sqrt[8]{15}$$

$$\sqrt[16]{\frac{e^{20\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}{-9+25e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-225e^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+209e^{20\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}}$$

$$\frac{1}{\sqrt[16]{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}}=$$

$$\sqrt[8]{\frac{15}{2}}\ \sqrt[16]{\pi}\ \sqrt[16]{\frac{\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{5\pi}}{-9+25\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{2\pi}-225\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{4\pi}+209\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{5\pi}}}$$

Integral representations:

$$\frac{1}{\sqrt[16]{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}}=$$

$$\frac{\sqrt[8]{15}\ \sqrt[16]{\frac{e^{10\int_0^\infty \sin(t)/t\,dt}\int_0^\infty \frac{\sin(t)}{t}\,dt}{-9+25\,e^{4\int_0^\infty \sin(t)/t\,dt}-225\,e^{8\int_0^\infty \sin(t)/t\,dt}+209\,e^{10\int_0^\infty \sin(t)/t\,dt}}}}{\sqrt[16]{2}}$$

$$\frac{1}{\sqrt[16]{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}}=$$

$$\frac{\sqrt[8]{15}\ \sqrt[16]{\frac{e^{10\int_0^\infty 1/\left(1+t^2\right)dt}\int_0^\infty \frac{1}{1+t^2}\,dt}{-9+25\,e^{4\int_0^\infty 1/\left(1+t^2\right)dt}-225\,e^{8\int_0^\infty 1/\left(1+t^2\right)dt}+209\,e^{10\int_0^\infty 1/\left(1+t^2\right)dt}}}}{\sqrt[16]{2}}$$

$$\frac{1}{\sqrt[16]{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}}=$$

$$\sqrt[8]{15}\ \sqrt[16]{\frac{e^{20\int_0^1 \sqrt{1-t^2}\,dt}\int_0^1 \sqrt{1-t^2}\,dt}{-9+25\,e^{8\int_0^1 \sqrt{1-t^2}\,dt}-225\,e^{16\int_0^1 \sqrt{1-t^2}\,dt}+209\,e^{20\int_0^1 \sqrt{1-t^2}\,dt}}}$$

-Pi+1/golden ratio+8 log base 0.9925175((1/ (((((4/Pi)*[(((1-exp-(((1*(2Pi)/2)))))/1^2)))-(((1-exp-(((3*2Pi)/2)))))/3^2))+(((1-exp-(((5*2Pi)/2)))))/5^2)]))))

Input interpretation:

$$-\pi+\frac{1}{\phi}+8\log_{0.9925175}\left(\frac{1}{\frac{4}{\pi}\left(\frac{1-\exp\left(-\left(1\times\frac{2\pi}{2}\right)\right)}{1^2}-\frac{1-\exp\left(-\left(\frac{1}{2}(3\times 2\pi)\right)\right)}{3^2}+\frac{1-\exp\left(-\left(\frac{1}{2}(5\times 2\pi)\right)\right)}{5^2}\right)}\right)$$

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

ϕ is the golden ratio

Result:

125.476...

125.476… 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:

$$-\pi+\frac{1}{\phi}+8\log_{0.992518}\left(\frac{1}{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}}\right)=$$

$$-\pi+\frac{1}{\phi}+\frac{8\log\left(\frac{1}{\frac{4\left((1-\exp(-\pi))\frac{1}{1}-\frac{1}{9}(1-\exp(-3\pi))+\frac{1-\exp(-5\pi)}{5^2}\right)}{\pi}}\right)}{\log(0.992518)}$$

Series representations:

$$-\pi+\frac{1}{\phi}+8\log_{0.992518}\left(\frac{1}{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2}-\frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2}+\frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)4}{\pi}}\right)=$$

$$\frac{1}{\phi}-\pi-\frac{8\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{225\pi}{836-36\exp(-5\pi)+100\exp(-3\pi)-900\exp(-\pi)}\right)^k}{k}}{\log(0.992518)}$$

$$-\pi + \frac{1}{\phi} + 8 \log_{0.992518}\left(\frac{1}{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2} - \frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2} + \frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}\right) =$$

$$\frac{1}{\phi} - \pi - 1065.16 \log\left(\frac{225\pi}{836 - 36\exp(-5\pi) + 100\exp(-3\pi) - 900\exp(-\pi)}\right) -$$

$$8 \log\left(\frac{225\pi}{836 - 36\exp(-5\pi) + 100\exp(-3\pi) - 900\exp(-\pi)}\right) \sum_{k=0}^{\infty} (-0.0074825)^k \, G(k)$$

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

$$-\pi + \frac{1}{\phi} + 8 \log_{0.992518}\left(\frac{1}{\frac{\left(\frac{1-\exp\left(-\frac{1}{2}(2\pi)\right)}{1^2} - \frac{1-\exp\left(-\frac{1}{2}(3\times 2\pi)\right)}{3^2} + \frac{1-\exp\left(-\frac{1}{2}(5\times 2\pi)\right)}{5^2}\right)^4}{\pi}}\right) =$$

$$\frac{1}{\phi} - \pi - 1065.16 \log\left(\frac{225\pi}{836 - 36\exp(-5\pi) + 100\exp(-3\pi) - 900\exp(-\pi)}\right) -$$

$$8 \log\left(\frac{225\pi}{836 - 36\exp(-5\pi) + 100\exp(-3\pi) - 900\exp(-\pi)}\right) \sum_{k=0}^{\infty} (-0.0074825)^k \, G(k)$$

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

8log base 0.9925175498(0.8867702525937869923416726)+11+1/golden ratio

Input interpretation:

$$8 \log_{0.9925175498}(0.8867702525937869923416726) + 11 + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.61803...

139.61803… result practically equal to the rest mass of Pion meson 139.57

Alternative representation:

$$8\log_{0.992518}(0.88677025259378699234167260000)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}+\frac{8\log(0.88677025259378699234167260000)}{\log(0.992518)}$$

Series representations:

$$8\log_{0.992518}(0.88677025259378699234167260000)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-\frac{8\sum_{k=1}^{\infty}\frac{(-1)^k(-0.11322974740621300765832740000)^k}{k}}{\log(0.992518)}$$

$$8\log_{0.992518}(0.88677025259378699234167260000)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-1065.17\log(0.88677025259378699234167260000)-$$
$$8\log(0.88677025259378699234167260000)\sum_{k=0}^{\infty}(-0.00748245)^k\,G(k)$$
$$\text{for }\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}G(-j+k)}{1+j}\right)$$

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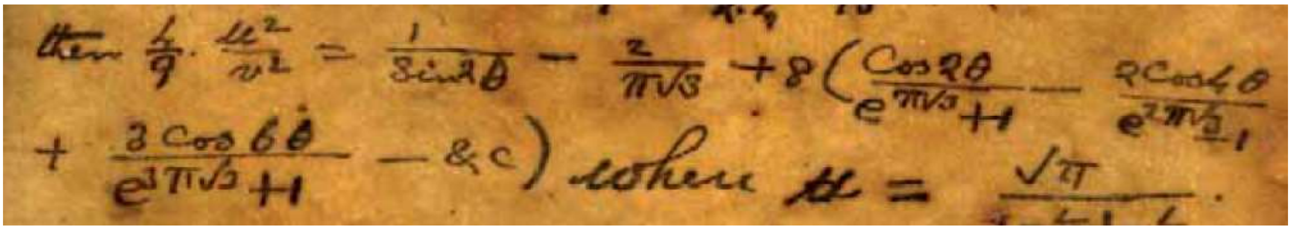

then $\frac{4}{9}\cdot\frac{u^2}{v^2}=\frac{1}{\sin 2\theta}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos 2\theta}{e^{\pi\sqrt{3}}+1}-\frac{2\cos 4\theta}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos 6\theta}{e^{3\pi\sqrt{3}}+1}-\&c\right)$ where $u=\frac{\sqrt{\pi}}{}$.

For θ = 2, we obtain

1/(sin(4)) – 2/(Pi*sqrt3) + 8((((cos(4))/(e^(Pi*sqrt3)+1)))-((2cos(8)/(e^(2Pi*sqrt3)-1)))+((3cos(12)/(e^(3Pi*sqrt3)+1))))

Input:

$$\frac{1}{\sin(4)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(8)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(12)}{e^{3\pi\sqrt{3}}+1}\right)$$

Exact result:

$$-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(4)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(8)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(12)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(4)$$

$\csc(x)$ is the cosecant function

Decimal approximation:

−1.71141826977207431495212249989046523190355342445751537927...

-1.711418269772…

Alternate forms:

$$-\frac{2}{\sqrt{3}\,\pi}+\frac{8\cos(4)}{1+e^{\sqrt{3}\,\pi}}-\frac{16\cos(8)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos(12)}{1+e^{3\sqrt{3}\,\pi}}-\frac{2\sin(4)}{\cos(8)-1}$$

$$-\frac{2}{\sqrt{3}\,\pi}+\frac{16\sin^2(4)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos^3(4)}{1+e^{3\sqrt{3}\,\pi}}-\frac{16\cos^2(4)}{e^{2\sqrt{3}\,\pi}-1}+\frac{8\cos(4)}{1+e^{\sqrt{3}\,\pi}}+\csc(4)-\frac{72\sin^2(4)\cos(4)}{1+e^{3\sqrt{3}\,\pi}}$$

$$-\frac{2}{\sqrt{3}\,\pi}+\Big(8\Big(-\cos(4)+e^{3\sqrt{3}\,\pi}\cos(4)-2\cos(8)-2\,e^{2\sqrt{3}\,\pi}(\cos(4)+\cos(8))-3\cos(12)+e^{\sqrt{3}\,\pi}(2\cos(4)+2\cos(8)+3\cos(12))\Big)\Big)\Big/\Big(\Big(e^{\sqrt{3}\,\pi}-1\Big)\Big(1+e^{\sqrt{3}\,\pi}\Big)\Big(1-e^{\sqrt{3}\,\pi}+e^{2\sqrt{3}\,\pi}\Big)\Big)+\csc(4)$$

Alternative representations:

$$\frac{1}{\sin(4)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right)=\frac{1}{\cos\left(-4+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-8\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-12\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(4)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right)=\frac{1}{\cos\left(-4+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(4\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(8\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(12\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(4)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right)=-\frac{1}{\cos\left(4+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-8\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-12\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

Series representations:

$$\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right) = -\frac{2\sqrt{3} + 6\,i\,\pi\sum_{k=1}^{\infty} q^{-1+2k} - 3\pi\sum_{k=0}^{\infty}\frac{(-1)^k\,2^{3+4k}\left(\frac{1}{1+e^{\sqrt{3}\,\pi}} - \frac{2^{1+2k}}{-1+e^{2\sqrt{3}\,\pi}} + \frac{3^{1+2k}}{1+e^{3\sqrt{3}\,\pi}}\right)}{(2k)!}}{3\pi} \quad \text{for } q = e^{4i}$$

$$\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right) = -\frac{2\sqrt{3} - 12\pi\sum_{k=-\infty}^{\infty}\frac{(-1)^k}{16-k^2\pi^2} - 3\pi\sum_{k=0}^{\infty}\frac{(-1)^k\,2^{3+4k}\left(\frac{1}{1+e^{\sqrt{3}\,\pi}} - \frac{2^{1+2k}}{-1+e^{2\sqrt{3}\,\pi}} + \frac{3^{1+2k}}{1+e^{3\sqrt{3}\,\pi}}\right)}{(2k)!}}{3\pi}$$

$$\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right) = -\frac{1}{3\pi}\left(2\sqrt{3} + 6\,i\,\pi\sum_{k=1}^{\infty} q^{-1+2k} - 3\pi\sum_{k=0}^{\infty}\left(\frac{(-1)^k\,2^{3+4k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^{1+k}\,2^{4+6k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^k\,2^{3+4k}\times 3^{1+2k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(2k)!}\right)\right) \quad \text{for } q = e^{4i}$$

Integral representations:

$$\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right) = \frac{8}{1+e^{\pi\sqrt{3}}} - \frac{16}{-1+e^{2\pi\sqrt{3}}} + \frac{24}{1+e^{3\pi\sqrt{3}}} + \frac{1}{4\int_0^1\cos(4t)\,dt} + \int_0^1 32\left(-\frac{\sin(4t)}{1+e^{\pi\sqrt{3}}} + \frac{4\sin(8t)}{-1+e^{2\pi\sqrt{3}}} - \frac{9\sin(12t)}{1+e^{3\pi\sqrt{3}}}\right)dt - \frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right) = \frac{8}{1+e^{\pi\sqrt{3}}} - \frac{16}{-1+e^{2\pi\sqrt{3}}} + \frac{24}{1+e^{3\pi\sqrt{3}}} + \int_0^1 32\left(-\frac{\sin(4t)}{1+e^{\pi\sqrt{3}}} + \frac{4\sin(8t)}{-1+e^{2\pi\sqrt{3}}} - \frac{9\sin(12t)}{1+e^{3\pi\sqrt{3}}}\right)dt - \frac{2}{\pi\sqrt{3}} + \frac{i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\mathcal{A}^{-4/s+s}}{s^{3/2}}\,ds} \quad \text{for } \gamma > 0$$

$$\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(8)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(12)}{e^{3\pi\sqrt{3}}+1}\right) =$$

$$\left(-8\int_0^1 \cos(4t)\,dt + \pi\sqrt{3} + 4\pi\left(\int_0^1 \cos(4t)\,dt\right)\right.$$

$$\left.\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(\frac{12\,\mathcal{A}^{-36/s+s}\sqrt{\pi}}{\left(1+e^{3\pi\sqrt{3}}\right)i\pi\sqrt{s}} - \frac{8\,\mathcal{A}^{-16/s+s}\sqrt{\pi}}{\left(-1+e^{2\pi\sqrt{3}}\right)i\pi\sqrt{s}} + \frac{4\,\mathcal{A}^{-4/s+s}\sqrt{\pi}}{\left(1+e^{\pi\sqrt{3}}\right)i\pi\sqrt{s}}\right)\right.\right.$$

$$\left.\left.ds\right)\sqrt{3}\right)\Big/\left(4\pi\sqrt{3}\int_0^1 \cos(4t)\,dt\right) \text{ for } \gamma > 0$$

From which, we obtain:

-(((((1/(sin(4)) – 2/(Pi*sqrt3) + 8((((cos(4))/(e^(Pi*sqrt3)+1)))-((2cos(8)/(e^(2Pi*sqrt3)-1)))+((3cos(12)/(e^(3Pi*sqrt3)+1)))))))))^9

Input:

$$-\left(\frac{1}{\sin(4)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1} - 2\times\frac{\cos(8)}{e^{2\pi\sqrt{3}}-1} + 3\times\frac{\cos(12)}{e^{3\pi\sqrt{3}}+1}\right)\right)^9$$

Exact result:

$$-\left(-\frac{2}{\sqrt{3}\,\pi} + 8\left(\frac{\cos(4)}{1+e^{\sqrt{3}\,\pi}} - \frac{2\cos(8)}{e^{2\sqrt{3}\,\pi}-1} + \frac{3\cos(12)}{1+e^{3\sqrt{3}\,\pi}}\right) + \csc(4)\right)^9$$

$\csc(x)$ is the cosecant function

Decimal approximation:

125.95211796021727282785322390678722202741664393419130800 15...

125.9521179… 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

And:

-(((((1/(sin(4)) – 2/(Pi*sqrt3) + 8((((cos(4))/(e^(Pi*sqrt3)+1)))-((2cos(8)/(e^(2Pi*sqrt3)-1)))+((3cos(12)/(e^(3Pi*sqrt3)+1)))))))))^9+11+Pi-1/golden ratio

Input:

$$-\left(\frac{1}{\sin(4)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(4)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(8)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(12)}{e^{3\pi\sqrt{3}}+1}\right)\right)^9+11+\pi-\frac{1}{\phi}$$

ϕ is the golden ratio

Exact result:

$$-\frac{1}{\phi}+11+\pi-\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(4)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(8)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(12)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(4)\right)^9$$

$\csc(x)$ is the cosecant function

Decimal approximation:

139.4756766250571712181112804557010867938935041537606509603...

139.475676625… result practically equal to the rest mass of Pion meson 139.57

For θ = 3/2, we obtain:

1/(sin(3)) – 2/(Pi*sqrt3) + 8((((cos(3))/(e^(Pi*sqrt3)+1)))-((2cos(6)/(e^(2Pi*sqrt3)-1)))+((3cos(9)/(e^(3Pi*sqrt3)+1))))

Input:

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(6)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)$$

Exact result:

$$-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)$$

$\csc(x)$ is the cosecant function

Decimal approximation:

6.684152177327028995705938987005415639180638709473686259969...

6.684152177327…

Alternate forms:

$$-\frac{2}{\sqrt{3}\,\pi}+\frac{8\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{16\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos(9)}{1+e^{3\sqrt{3}\,\pi}}-\frac{2\sin(3)}{\cos(6)-1}$$

$$-\frac{2}{\sqrt{3}\,\pi}+\frac{16\sin^2(3)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos^3(3)}{1+e^{3\sqrt{3}\,\pi}}-\frac{16\cos^2(3)}{e^{2\sqrt{3}\,\pi}-1}+\frac{8\cos(3)}{1+e^{\sqrt{3}\,\pi}}+\csc(3)-\frac{72\sin^2(3)\cos(3)}{1+e^{3\sqrt{3}\,\pi}}$$

$$-\frac{2}{\sqrt{3}\,\pi}+\Big(8\Big(-\cos(3)+e^{3\sqrt{3}\,\pi}\cos(3)-2\cos(6)-2\,e^{2\sqrt{3}\,\pi}(\cos(3)+\cos(6))-$$
$$3\cos(9)+e^{\sqrt{3}\,\pi}(2\cos(3)+2\cos(6)+3\cos(9))\Big)\Big)\Big/$$
$$\left(\left(e^{\sqrt{3}\,\pi}-1\right)\left(1+e^{\sqrt{3}\,\pi}\right)\left(1-e^{\sqrt{3}\,\pi}+e^{2\sqrt{3}\,\pi}\right)\right)+\csc(3)$$

Alternative representations:

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)=$$
$$\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-3\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-6\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-9\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)=$$
$$\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(3\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(6\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(9\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)=$$
$$-\frac{1}{\cos\left(3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-3\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-6\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-9\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

Series representations:

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)=$$
$$-\frac{2\sqrt{3}+6\,i\,\pi\sum_{k=1}^{\infty}q^{-1+2k}-3\,\pi\sum_{k=0}^{\infty}\frac{8(-9)^k\left(\frac{1}{1+e^{\sqrt{3}\,\pi}}-\frac{2^{1+2k}}{-1+e^{2\sqrt{3}\,\pi}}+\frac{3^{1+2k}}{1+e^{3\sqrt{3}\,\pi}}\right)}{(2k)!}}{3\,\pi}\quad\text{for}$$
$$q=e^{3\,i}$$

$$\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right) = -\frac{1}{3\pi}\left(2\sqrt{3} + 6 i \pi \sum_{k=1}^{\infty} q^{-1+2k} - 3\pi \sum_{k=0}^{\infty}\left(\frac{8(-1)^k 3^{2k}}{\left(1+e^{\sqrt{3}\pi}\right)(2k)!} + \frac{(-1)^{1+k} 2^{4+2k} \times 3^{2k}}{\left(-1+e^{2\sqrt{3}\pi}\right)(2k)!} + \frac{8(-1)^k 3^{1+4k}}{\left(1+e^{3\sqrt{3}\pi}\right)(2k)!}\right)\right) \quad \text{for } q = e^{3i}$$

$$\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right) = -\frac{1}{3\pi}\left(2\sqrt{3} - 9\pi \sum_{k=-\infty}^{\infty} \frac{(-1)^k}{9-k^2\pi^2} - 3\pi \sum_{k=0}^{\infty}\left(\frac{8(-1)^k 3^{2k}}{\left(1+e^{\sqrt{3}\pi}\right)(2k)!} + \frac{(-1)^{1+k} 2^{4+2k} \times 3^{2k}}{\left(-1+e^{2\sqrt{3}\pi}\right)(2k)!} + \frac{8(-1)^k 3^{1+4k}}{\left(1+e^{3\sqrt{3}\pi}\right)(2k)!}\right)\right)$$

Integral representations:

$$\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right) = \frac{8}{1+e^{\sqrt{3}\pi}} - \frac{16}{-1+e^{2\sqrt{3}\pi}} + \frac{24}{1+e^{3\sqrt{3}\pi}} - \frac{2}{\sqrt{3}\pi} + \frac{1}{\pi}\int_0^{\infty} \frac{t^{3/\pi}}{t+t^2}\,dt + \int_0^1 \left(-\frac{24\sin(3t)}{1+e^{\sqrt{3}\pi}} + \frac{96\sin(6t)}{-1+e^{2\sqrt{3}\pi}} - \frac{216\sin(9t)}{1+e^{3\sqrt{3}\pi}}\right)dt$$

$$\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right) = -\frac{1}{3\pi}\left(2\sqrt{3} - 3\pi \int_{-i\infty+\gamma}^{i\infty+\gamma}\left(-\frac{4 i e^{-9/(4s)+s}}{\left(1+e^{\sqrt{3}\pi}\right)\sqrt{\pi}\sqrt{s}} + \frac{8 i e^{-9/s+s}}{\left(-1+e^{2\sqrt{3}\pi}\right)\sqrt{\pi}\sqrt{s}} - \frac{12 i e^{-81/(4s)+s}}{\left(1+e^{3\sqrt{3}\pi}\right)\sqrt{\pi}\sqrt{s}}\right)ds - 3\int_0^{\infty} \frac{t^{3/\pi}}{t+t^2}\,dt\right) \quad \text{for } \gamma > 0$$

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)=$$

$$-\frac{1}{3\pi}\left(2\sqrt{3}-3\int_0^\infty\frac{t^{3/\pi}}{t+t^2}\,dt-3\pi\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(-\frac{i\,2^{2+2s}\times 3^{-2s}\,\Gamma(s)}{\left(1+e^{\sqrt{3}\,\pi}\right)\sqrt{\pi}\,\Gamma\left(\frac{1}{2}-s\right)}+\frac{8\,i\,3^{-2s}\,\Gamma(s)}{\left(-1+e^{2\sqrt{3}\,\pi}\right)\sqrt{\pi}\,\Gamma\left(\frac{1}{2}-s\right)}-\frac{i\,2^{2+2s}\times 3^{1-4s}\,\Gamma(s)}{\left(1+e^{3\sqrt{3}\,\pi}\right)\sqrt{\pi}\,\Gamma\left(\frac{1}{2}-s\right)}\right)ds\right)\quad\text{for } 0<\gamma<\frac{1}{2}$$

$$\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)=-\frac{1}{3\pi}\left(2\sqrt{3}-3\int_0^\infty\frac{t^{3/\pi}}{t+t^2}\,dt-3\pi\int_{\frac{\pi}{2}}^{9}\left(-\frac{24\sin(t)}{1+e^{3\sqrt{3}\,\pi}}+\frac{1}{9-\frac{\pi}{2}}\left(3-\frac{\pi}{2}\right)\left(-\frac{8\sin\left(\frac{-3\pi-3t+\frac{\pi t}{2}}{-9+\frac{\pi}{2}}\right)}{1+e^{\sqrt{3}\,\pi}}+\frac{16\left(6-\frac{\pi}{2}\right)\sin\left(\frac{\frac{3\pi}{2}-\frac{6\left(-3\pi-3t+\frac{\pi t}{2}\right)}{-9+\frac{\pi}{2}}+\frac{\pi\left(-3\pi-3t+\frac{\pi t}{2}\right)}{2\left(-9+\frac{\pi}{2}\right)}}{-3+\frac{\pi}{2}}\right)}{\left(-1+e^{2\sqrt{3}\,\pi}\right)\left(3-\frac{\pi}{2}\right)}\right)\right)dt\right)$$

From which, we obtain:

(((1/(sin(3)) – 2/(Pi*sqrt3) + 8((((cos(3))/(e^(Pi*sqrt3)+1)))-((2cos(6)/(e^(2Pi*sqrt3)-1)))+((3cos(9)/(e^(3Pi*sqrt3)+1)))))))^Pi+76+29

Where 76 and 29 are Lucas numbers

Input:

$$\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(6)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29$$

Exact result:

$$105+\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)\right)^{\pi}$$

csc(*x*) is the cosecant function

Decimal approximation:

495.8044368195752677327442431600131432338288885915975845291...

495.80443681… result very near to the rest mass of Kaon meson 497.614

Alternate forms:

$$105+\left(-\frac{2}{\sqrt{3}\,\pi}+\frac{8\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{16\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos(9)}{1+e^{3\sqrt{3}\,\pi}}-\frac{2\sin(3)}{\cos(6)-1}\right)^{\pi}$$

$$105+\left(-\frac{2\,i}{e^{-3\,i}-e^{3\,i}}+8\left(\frac{e^{-3\,i}+e^{3\,i}}{2\left(1+e^{\sqrt{3}\,\pi}\right)}-\frac{e^{-6\,i}+e^{6\,i}}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\left(e^{-9\,i}+e^{9\,i}\right)}{2\left(1+e^{3\sqrt{3}\,\pi}\right)}\right)-\frac{2}{\sqrt{3}\,\pi}\right)^{\pi}$$

$$105+3^{-\pi/2}\left(\left(e^{\sqrt{3}\,\pi}-1\right)\left(1+e^{\sqrt{3}\,\pi}\right)\right)^{-\pi}$$
$$\left(\left(\csc(3)\left(e^{4\sqrt{3}\,\pi}\left(\sqrt{3}\,\pi-2\sin(3)\right)+2\sin(3)+e^{3\sqrt{3}\,\pi}\left(2\sin(3)+\sqrt{3}\,\pi\right.\right.\right.\right.$$
$$\left.(4\sin(6)-1)\right)-16\sqrt{3}\,e^{2\sqrt{3}\,\pi}\,\pi\sin(3)\,(\cos(3)+\cos(6))-$$
$$\sqrt{3}\,\pi\,(1+4\sin(6)+8\sin(3)\,(2\cos(6)+3\cos(9)))+e^{\sqrt{3}\,\pi}$$
$$\left.\left.\left.\left(\sqrt{3}\,\pi\,(1+8\sin(6)+8\sin(3)\,(2\cos(6)+3\cos(9)))-2\sin(3)\right)\right)\right)\right/$$
$$\left(\left(1-e^{\sqrt{3}\,\pi}+e^{2\sqrt{3}\,\pi}\right)\pi\right)\right)^{\pi}$$

Alternative representations:

$$\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29=$$
$$105+\left(\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-3\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-6\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-9\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{\pi}$$

$$\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29=$$
$$105+\left(-\frac{1}{\cos\left(3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-3\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-6\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-9\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{\pi}$$

$$\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 76 + 29 =$$

$$105 + \left(\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)} + 8\left(\frac{\cosh(3\,i)}{1+e^{\pi\sqrt{3}}} - \frac{2\cosh(6\,i)}{-1+e^{2\pi\sqrt{3}}} + \frac{3\cosh(9\,i)}{1+e^{3\pi\sqrt{3}}}\right) - \frac{2}{\pi\sqrt{3}}\right)^{\pi}$$

Series representations:

$$\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 76 + 29 =$$

$$105 + \left(-\frac{2}{\sqrt{3}\,\pi} - 2\,i\sum_{k=1}^{\infty} q^{-1+2k} + 8\sum_{k=0}^{\infty}\frac{(-9)^k\left(\frac{1}{1+e^{\sqrt{3}\,\pi}} - \frac{2^{1+2k}}{-1+e^{2\sqrt{3}\,\pi}} + \frac{3^{1+2k}}{1+e^{3\sqrt{3}\,\pi}}\right)}{(2k)!}\right)^{\pi} \text{ for } q = e^{3i}$$

$$\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 76 + 29 =$$

$$105 + \left(-\frac{2}{\sqrt{3}\,\pi} + 3\sum_{k=-\infty}^{\infty}\frac{(-1)^k}{9-k^2\pi^2} + 8\sum_{k=0}^{\infty}\frac{(-9)^k\left(\frac{1}{1+e^{\sqrt{3}\,\pi}} - \frac{2^{1+2k}}{-1+e^{2\sqrt{3}\,\pi}} + \frac{3^{1+2k}}{1+e^{3\sqrt{3}\,\pi}}\right)}{(2k)!}\right)^{\pi}$$

$$\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 76 + 29 =$$

$$105 + \left(-\frac{2}{\sqrt{3}\,\pi} - 2\,i\sum_{k=1}^{\infty} q^{-1+2k} + 8\sum_{k=0}^{\infty}\left(\frac{(-1)^k\,3^{2k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^{1+k}\,2^{1+2k}\times 3^{2k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^k\,3^{1+4k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(2k)!}\right)\right)^{\pi} \text{ for } q = e^{3i}$$

And:

1/Pi*(((((((1/(sin(3)) – 2/(Pi*sqrt3) + 8((((cos(3))/(e^(Pi*sqrt3)+1)))-((2cos(6)/(e^(2Pi*sqrt3)-1)))+((3cos(9)/(e^(3Pi*sqrt3)+1)))))))^Pi+76+29))))-18

Where 18 is a Lucas number

Input:

$$\frac{1}{\pi}\left(\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - 2\times\frac{\cos(6)}{e^{2\pi\sqrt{3}}-1} + 3\times\frac{\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 76 + 29\right) - 18$$

Exact result:

$$\frac{105+\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)\right)^{\pi}}{\pi}-18$$

csc(*x*) is the cosecant function

Decimal approximation:

139.8194538534574364349036686367006235538504921093483263622...

139.8194538… result practically equal to the rest mass of Pion meson 139.57

Alternate forms:

$$\frac{105-18\pi+\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)\right)^{\pi}}{\pi}$$

$$-18+\frac{105}{\pi}+\frac{\left(-\frac{2}{\sqrt{3}\,\pi}+\frac{8\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{16\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos(9)}{1+e^{3\sqrt{3}\,\pi}}-\frac{2\sin(3)}{\cos(6)-1}\right)^{\pi}}{\pi}$$

$$-18+\frac{105}{\pi}+\frac{\left(-\frac{2i}{e^{-3i}-e^{3i}}+8\left(\frac{e^{-3i}+e^{3i}}{2\left(1+e^{\sqrt{3}\,\pi}\right)}-\frac{e^{-6i}+e^{6i}}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\left(e^{-9i}+e^{9i}\right)}{2\left(1+e^{3\sqrt{3}\,\pi}\right)}\right)-\frac{2}{\sqrt{3}\,\pi}\right)^{\pi}}{\pi}$$

Alternative representations:

$$\frac{\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29}{\pi}-18=$$
$$-18+\frac{105+\left(\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-3i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-6i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-9i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{\pi}}{\pi}$$

$$\frac{\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29}{\pi}-18=$$
$$-18+\frac{105+\left(-\frac{1}{\cos\left(3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-3i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-6i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-9i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{\pi}}{\pi}$$

$$\frac{\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29}{\pi}-18=$$

$$-18+\frac{105+\left(\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(3i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(6i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(9i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{\pi}}{\pi}$$

Series representations:

$$\frac{\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29}{\pi}-18=$$

$$-\frac{1}{\pi}\left(-105+18\pi-\left(-\frac{2}{\sqrt{3}\,\pi}-2i\sum_{k=1}^{\infty}q^{-1+2k}+8\sum_{k=0}^{\infty}\frac{(-9)^k\left(\frac{1}{1+e^{\sqrt{3}\,\pi}}-\frac{2^{1+2k}}{-1+e^{2\sqrt{3}\,\pi}}+\frac{3^{1+2k}}{1+e^{3\sqrt{3}\,\pi}}\right)}{(2k)!}\right)^{\pi}\right) \text{ for } q=e^{3i}$$

$$\frac{\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29}{\pi}-18=$$

$$-\frac{1}{\pi}\left(-105+18\pi-\left(-\frac{2}{\sqrt{3}\,\pi}-2i\sum_{k=1}^{\infty}q^{-1+2k}+8\sum_{k=0}^{\infty}\left(\frac{(-1)^k\,3^{2k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(2k)!}+\frac{(-1)^{1+k}\,2^{1+2k}\times 3^{2k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(2k)!}+\frac{(-1)^k\,3^{1+4k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(2k)!}\right)\right)^{\pi}\right) \text{ for } q=e^{3i}$$

$$\frac{\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+76+29}{\pi}-18=$$

$$-\frac{1}{\pi}\left(-105+18\pi-\left(-\frac{2}{\sqrt{3}\,\pi}+3\sum_{k=-\infty}^{\infty}\frac{(-1)^k}{9-k^2\pi^2}+8\sum_{k=0}^{\infty}\left(\frac{(-1)^k\,3^{2k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(2k)!}+\frac{(-1)^{1+k}\,2^{1+2k}\times 3^{2k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(2k)!}+\frac{(-1)^k\,3^{1+4k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(2k)!}\right)\right)^{\pi}\right)$$

1/Pi*(((((((1/(sin(3)) – 2/(Pi*sqrt3) + 8((((cos(3))/(e^(Pi*sqrt3)+1)))-((2cos(6)/(e^(2Pi*sqrt3)-1)))+((3cos(9)/(e^(3Pi*sqrt3)+1)))))))^Pi+47))))-11-golden ratio^2

Where 11 and 47 are Lucas numbers

Input:

$$\frac{1}{\pi}\left(\left(\frac{1}{\sin(3)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(6)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi}+47\right)-11-\phi^2$$

ϕ is the golden ratio

Exact result:

$$-\phi^2-11+\frac{47+\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)\right)^{\pi}}{\pi}$$

$\csc(x)$ is the cosecant function

Decimal approximation:

125.73944646604768263750856525112331944013286402364961544453...

125.739446466… 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

Alternate forms:

$$-\frac{-94+25\pi+\sqrt{5}\,\pi-2\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)\right)^{\pi}}{2\pi}$$

$$-\frac{25}{2}-\frac{\sqrt{5}}{2}+\frac{47}{\pi}+\frac{\left(-\frac{2}{\sqrt{3}\,\pi}+\frac{8\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{16\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{24\cos(9)}{1+e^{3\sqrt{3}\,\pi}}-\frac{2\sin(3)}{\cos(6)-1}\right)^{\pi}}{\pi}$$

$$-\phi^2-11+\frac{47}{\pi}+\frac{\left(-\frac{2i}{e^{-3i}-e^{3i}}+8\left(\frac{e^{-3i}+e^{3i}}{2\left(1+e^{\sqrt{3}\,\pi}\right)}-\frac{e^{-6i}+e^{6i}}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\left(e^{-9i}+e^{9i}\right)}{2\left(1+e^{3\sqrt{3}\,\pi}\right)}\right)-\frac{2}{\sqrt{3}\,\pi}\right)^{\pi}}{\pi}$$

Expanded form:

$$-\frac{25}{2}-\frac{\sqrt{5}}{2}+\frac{47}{\pi}+\frac{\left(-\frac{2}{\sqrt{3}\,\pi}+8\left(\frac{\cos(3)}{1+e^{\sqrt{3}\,\pi}}-\frac{2\cos(6)}{e^{2\sqrt{3}\,\pi}-1}+\frac{3\cos(9)}{1+e^{3\sqrt{3}\,\pi}}\right)+\csc(3)\right)^{\pi}}{\pi}$$

Alternative representations:

$$\frac{\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 47}{\pi} - 11 - \phi^2 =$$

$$-11 - \phi^2 + \frac{47 + \left(\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)} + 8\left(\frac{\cosh(-3i)}{1+e^{\pi\sqrt{3}}} - \frac{2\cosh(-6i)}{-1+e^{2\pi\sqrt{3}}} + \frac{3\cosh(-9i)}{1+e^{3\pi\sqrt{3}}}\right) - \frac{2}{\pi\sqrt{3}}\right)^{\pi}}{\pi}$$

$$\frac{\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 47}{\pi} - 11 - \phi^2 =$$

$$-11 - \phi^2 + \frac{47 + \left(-\frac{1}{\cos\left(3+\frac{\pi}{2}\right)} + 8\left(\frac{\cosh(-3i)}{1+e^{\pi\sqrt{3}}} - \frac{2\cosh(-6i)}{-1+e^{2\pi\sqrt{3}}} + \frac{3\cosh(-9i)}{1+e^{3\pi\sqrt{3}}}\right) - \frac{2}{\pi\sqrt{3}}\right)^{\pi}}{\pi}$$

$$\frac{\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 47}{\pi} - 11 - \phi^2 =$$

$$-11 - \phi^2 + \frac{47 + \left(\frac{1}{\cos\left(-3+\frac{\pi}{2}\right)} + 8\left(\frac{\cosh(3i)}{1+e^{\pi\sqrt{3}}} - \frac{2\cosh(6i)}{-1+e^{2\pi\sqrt{3}}} + \frac{3\cosh(9i)}{1+e^{3\pi\sqrt{3}}}\right) - \frac{2}{\pi\sqrt{3}}\right)^{\pi}}{\pi}$$

Series representations:

$$\frac{\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 47}{\pi} - 11 - \phi^2 =$$

$$-\frac{1}{2\pi}\left(-94 + 25\pi + \sqrt{5}\,\pi - 2\left(-\frac{2}{\sqrt{3}\,\pi} - 2i\sum_{k=1}^{\infty} q^{-1+2k} + 8\sum_{k=0}^{\infty}\left(\frac{(-1)^k\,3^{2k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^{1+k}\,2^{1+2k}\times 3^{2k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^k\,3^{1+4k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(2k)!}\right)\right)^{\pi}\right) \quad \text{for } q = e^{3i}$$

$$\frac{\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 47}{\pi} - 11 - \phi^2 =$$

$$-\frac{1}{2\pi}\left(-94 + 25\pi + \sqrt{5}\,\pi - 2\left(-\frac{2}{\sqrt{3}\,\pi} + 3\sum_{k=-\infty}^{\infty}\frac{(-1)^k}{9-k^2\pi^2} + 8\sum_{k=0}^{\infty}\left(\frac{(-1)^k\,3^{2k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^{1+k}\,2^{1+2k}\times 3^{2k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(2k)!} + \frac{(-1)^k\,3^{1+4k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(2k)!}\right)\right)^{\pi}\right)$$

$$\frac{\left(\frac{1}{\sin(3)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(3)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(6)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(9)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{\pi} + 47}{\pi} - 11 - \phi^2 =$$

$$-\frac{1}{2\pi}\left(-94 + 25\pi + \sqrt{5}\,\pi - 2\left(-\frac{2}{\sqrt{3}\,\pi} - 2i\sum_{k=1}^{\infty}q^{-1+2k} + 8\sum_{k=0}^{\infty}\left(\frac{(-1)^{-1+k}\left(3-\frac{\pi}{2}\right)^{1+2k}}{\left(1+e^{\sqrt{3}\,\pi}\right)(1+2k)!} - \frac{2(-1)^{-1+k}\left(6-\frac{\pi}{2}\right)^{1+2k}}{\left(-1+e^{2\sqrt{3}\,\pi}\right)(1+2k)!} + \frac{3(-1)^{-1+k}\left(9-\frac{\pi}{2}\right)^{1+2k}}{\left(1+e^{3\sqrt{3}\,\pi}\right)(1+2k)!}\right)\right)^{\pi}\right) \quad \text{for } q = e^{3i}$$

For θ = 2.399963, (that is the “golden angle” in radians) we obtain:

1/(sin(2*2.399963)) – 2/(Pi*sqrt3) + 8((((cos(2*2.399963))/(e^(Pi*sqrt3)+1)))-((2cos(4*2.399963)/(e^(2Pi*sqrt3)-1)))+((3cos(6*2.399963)/(e^(3Pi*sqrt3)+1))))

Input interpretation:

$$\frac{1}{\sin(2\times 2.399963)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.399963)}{e^{\pi\sqrt{3}}+1} - 2\times\frac{\cos(4\times 2.399963)}{e^{2\pi\sqrt{3}}-1} + 3\times\frac{\cos(6\times 2.399963)}{e^{3\pi\sqrt{3}}+1}\right)$$

Result:

−1.368083…

-1.368083…

Alternative representations:

$$\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)=\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)=\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)=-\frac{1}{\cos\left(4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}$$

Series representations:

$$\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)=$$

$$\frac{8\sum_{k=0}^{\infty}\frac{(-1)^k e^{3.1372k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-$$

$$\frac{16\sum_{k=0}^{\infty}\frac{(-1)^k e^{4.5235k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\frac{24\sum_{k=0}^{\infty}\frac{(-1)^k e^{5.33443k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k 4.79993^{1+2k}}{(1+2k)!}}-$$

$$\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\quad\text{for } (x\in\mathbb{R}\text{ and } x<0)$$

$$\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)=$$

$$\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}+$$

$$\frac{8\sum_{k=0}^{\infty}\frac{(-1)^k e^{3.1372k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-$$

$$\frac{16\sum_{k=0}^{\infty}\frac{(-1)^k e^{4.5235k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\frac{24\sum_{k=0}^{\infty}\frac{(-1)^k e^{5.33443k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-$$

$$\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\quad\text{for } (x\in\mathbb{R}\text{ and } x<0)$$

$$\frac{1}{\sin(2\times 2.39996)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right) =$$

$$\frac{8\sum_{k=0}^{\infty}\frac{(-1)^k e^{3.1372k}}{(2k)!}}{1+\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(3-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(3-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)} -$$

$$\frac{16\sum_{k=0}^{\infty}\frac{(-1)^k e^{4.5235k}}{(2k)!}}{-1+\exp\left(2\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(3-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(3-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)} +$$

$$\frac{24\sum_{k=0}^{\infty}\frac{(-1)^k e^{5.33443k}}{(2k)!}}{1+\exp\left(3\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(3-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(3-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)} +$$

$$\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k 4.79993^{1+2k}}{(1+2k)!}} - \frac{2\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(3-z_0)/(2\pi)\rfloor} z_0^{1/2(-1-\lfloor\arg(3-z_0)/(2\pi)\rfloor)}}{\pi\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}}$$

Integral representations:

$$\frac{1}{\sin(2\times 2.39996)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right) =$$

$$\frac{8}{1+e^{\pi\sqrt{3}}} - \frac{16}{-1+e^{2\pi\sqrt{3}}} + \frac{24}{1+e^{3\pi\sqrt{3}}} + \frac{0.208337}{\int_0^1\cos(4.79993t)\,dt} + \int_0^1\left(-\frac{38.3994\sin(4.79993t)}{1+e^{\pi\sqrt{3}}} + \frac{153.598\sin(9.59985t)}{-1+e^{2\pi\sqrt{3}}} - \frac{345.595\sin(14.3998t)}{1+e^{3\pi\sqrt{3}}}\right)dt - \frac{2}{\pi\sqrt{3}}$$

$$\frac{1}{\sin(2\times 2.39996)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right) =$$

$$\frac{8}{1+e^{\pi\sqrt{3}}} - \frac{16}{-1+e^{2\pi\sqrt{3}}} + \frac{24}{1+e^{3\pi\sqrt{3}}} + \int_0^1\left(-\frac{38.3994\sin(4.79993t)}{1+e^{\pi\sqrt{3}}} + \frac{153.598\sin(9.59985t)}{-1+e^{2\pi\sqrt{3}}} - \frac{345.595\sin(14.3998t)}{1+e^{3\pi\sqrt{3}}}\right)dt - \frac{2}{\pi\sqrt{3}} + \frac{0.833346\,i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\mathcal{A}^{-5.75982/s+s}}{s^{3/2}}\,ds} \quad \text{for } \gamma > 0$$

$$\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)=$$

$$\left(-2\int_0^1\cos(4.79993\,t)\,dt+0.208337\,\pi\sqrt{3}+\pi\left(\int_0^1\cos(4.79993\,t)\,dt\right)\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\left(\frac{12\,\mathcal{A}^{-51.8384/s+s}\sqrt{\pi}}{\left(1+e^{3\pi\sqrt{3}}\right)i\,\pi\sqrt{s}}-\frac{8\,\mathcal{A}^{-23.0393/s+s}\sqrt{\pi}}{\left(-1+e^{2\pi\sqrt{3}}\right)i\,\pi\sqrt{s}}+\frac{4\,\mathcal{A}^{-5.75982/s+s}\sqrt{\pi}}{\left(1+e^{\pi\sqrt{3}}\right)i\,\pi\sqrt{s}}\right)ds\right)\sqrt{3}\right)\Big/\left(\pi\sqrt{3}\int_0^1\cos(4.79993\,t)\,dt\right)\quad\text{for }\gamma>0$$

And:

-1/(((1/(sin(2*2.399963)) – 2/(Pi*sqrt3) + 8((((cos(2*2.399963))/(e^(Pi*sqrt3)+1)))-((2cos(4*2.399963)/(e^(2Pi*sqrt3)-1)))+((3cos(6*2.399963)/(e^(3Pi*sqrt3)+1)))))))^1/32

Input interpretation:

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.399963)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.399963)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(4\times 2.399963)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(6\times 2.399963)}{e^{3\pi\sqrt{3}}+1}\right)}}$$

Result:

$-0.98548538\ldots+$
$0.097061838\ldots\,i$

Polar coordinates:

$r=0.990254$ (radius), $\theta=174.375°$ (angle)

0.990254 result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the dilaton value **0.989117352243 = ϕ**

Series representations:

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}}=$$

$$-\left(1\Bigg/\left(\left(\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}+\right.\right.\right.$$

$$8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\, 4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\right.$$

$$\frac{2\sum_{k=0}^{\infty}\frac{(-1)^k\, 9.59985^{2k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\left.\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\, 14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)-$$

$$\left.\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{\wedge}$$

$$\left.\left.(1/32)\right)\right)\quad\text{for }(x\in\mathbb{R}\text{ and }x<0)$$

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}} =$$

$$\begin{aligned}
&-\Bigg(1\Bigg/\Bigg(\Bigg(8\Bigg(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\\
&\qquad\frac{2\sum_{k=0}^{\infty}\frac{(-1)^k\,9.59985^{2k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+\\
&\qquad\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\,14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\Bigg)+\\
&\qquad\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{1+2k}}{(1+2k)!}}-\\
&\qquad\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\Bigg)\hat{}\\
&\qquad(1/32)\Bigg)\Bigg)\quad \text{for } (x\in\mathbb{R} \text{ and } x<0)
\end{aligned}$$

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}}=$$

$$-\left(1\Bigg/\left(\left(8\left(\frac{J_0(4.79993)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(4.79993)}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\right.\right.\right.\right.$$

$$\frac{2\left(J_0(9.59985)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(9.59985)\right)}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\left.\frac{3\left(J_0(14.3998)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(14.3998)\right)}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)+$$

$$\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}-$$

$$\left.\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)\widehat{}$$

$$\left.\left.\left.(1/32)\right)\right)\right) \quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

Integral representations:

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}}=$$

$$-\left(1\Bigg/\left(\left(\frac{0.208337}{\int_0^1\cos(4.79993\,t)\,dt}+8\left(\frac{1-4.79993\int_0^1\sin(4.79993\,t)\,dt}{1+e^{\pi\sqrt{3}}}-\right.\right.\right.\right.$$

$$\frac{2\left(1-9.59985\int_0^1\sin(9.59985\,t)\,dt\right)}{-1+e^{2\pi\sqrt{3}}}+$$

$$\left.\left.\left.\left.\frac{3\left(1-14.3998\int_0^1\sin(14.3998\,t)\,dt\right)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)\widehat{}\,(1/32)\right)\right)$$

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.39996)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}} =$$

$$-\left(1\Big/\left(\left(\frac{0.208337}{\int_0^1 \cos(4.79993\,t)\,dt} + 8\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(\frac{3\,\mathcal{A}^{-51.8384/s+s}\sqrt{\pi}}{2\left(1+e^{3\pi\sqrt{3}}\right)i\pi\sqrt{s}} - \frac{\mathcal{A}^{-23.0393/s+s}\sqrt{\pi}}{\left(-1+e^{2\pi\sqrt{3}}\right)i\pi\sqrt{s}} + \frac{\mathcal{A}^{-5.75982/s+s}\sqrt{\pi}}{2\left(1+e^{\pi\sqrt{3}}\right)i\pi\sqrt{s}}\right)ds - \frac{2}{\pi\sqrt{3}}\right){}^\wedge(1/32)\right)\right) \quad \text{for } \gamma > 0$$

$$-\frac{1}{\sqrt[32]{\frac{1}{\sin(2\times 2.39996)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1} - \frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1} + \frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}} =$$

$$-\left(1\Big/\left(\left(\frac{0.208337}{\int_0^1 \cos(4.79993\,t)\,dt} + 8\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(\frac{2.39996^{-2s}\,\Gamma(s)\sqrt{\pi}}{2\left(1+e^{\pi\sqrt{3}}\right)i\pi\,\Gamma\left(\frac{1}{2}-s\right)} - \frac{4.79993^{-2s}\,\Gamma(s)\sqrt{\pi}}{\left(-1+e^{2\pi\sqrt{3}}\right)i\pi\,\Gamma\left(\frac{1}{2}-s\right)} + \frac{3\times 7.19989^{-2s}\,\Gamma(s)\sqrt{\pi}}{2\left(1+e^{3\pi\sqrt{3}}\right)i\pi\,\Gamma\left(\frac{1}{2}-s\right)}\right)ds - \frac{2}{\pi\sqrt{3}}\right){}^\wedge(1/32)\right)\right) \quad \text{for } 0 < \gamma < \frac{1}{2}$$

4log base 0.990254 (((-1/(((1/(sin(2*2.399963)) – 2/(Pi*sqrt3) + 8((((cos(2*2.399963))/(e^(Pi*sqrt3)+1)))-((2cos(4*2.399963)/(e^(2Pi*sqrt3)-1)))+((3cos(6*2.399963)/(e^(3Pi*sqrt3)+1)))))))))

Input interpretation:

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.399963)} - \frac{2}{\pi\sqrt{3}} + 8\left(\frac{\cos(2\times 2.399963)}{e^{\pi\sqrt{3}}+1} - 2\times\frac{\cos(4\times 2.399963)}{e^{2\pi\sqrt{3}}-1} + 3\times\frac{\cos(6\times 2.399963)}{e^{3\pi\sqrt{3}}+1}\right)}\right)$$

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

Result:

128.004...

128.004…

Alternative representations:

$$4 \log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$\frac{4\log\left(-\frac{1}{8\left(\frac{\cos(4.79993)}{1+e^{\pi\sqrt{3}}}-\frac{2\cos(9.59985)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cos(14.3998)}{1+e^{3\pi\sqrt{3}}}\right)+\frac{1}{\sin(4.79993)}-\frac{2}{\pi\sqrt{3}}}\right)}{\log(0.990254)}$$

$$4 \log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=4$$

$$\log_{0.990254}\left(-\frac{1}{\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}}\right)$$

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=4$$

$$\log_{0.990254}\left(-\frac{1}{-\frac{1}{\cos\left(4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}}\right)$$

Series representations:

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$-\frac{4\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1-\frac{1}{8\left(\frac{\cos(4.79993)}{1+e^{\pi\sqrt{3}}}-\frac{2\cos(9.59985)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cos(14.3998)}{1+e^{3\pi\sqrt{3}}}\right)+\frac{1}{\sin(4.79993)}-\frac{2}{\pi\sqrt{3}}}\right)^k}{k}}{\log(0.990254)}$$

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$4\log_{0.990254}\left(-\left(1\middle/\left(\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}+\right.\right.\right.$$

$$8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\, 4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\right.$$

$$\frac{2\sum_{k=0}^{\infty}\frac{(-1)^k\, 9.59985^{2k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\left.\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\, 14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)-$$

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

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

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$4\log_{0.990254}\left(-\left(1\Bigg/\left(8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\frac{2\sum_{k=0}^{\infty}\frac{(-1)^k\,9.59985^{2k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\,14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)+\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{1+2k}}{(1+2k)!}}-\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)\right)\right)$$

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

Integral representations:

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$4\log_{0.990254}\left(-\left(1\Bigg/\left(\frac{0.208337}{\int_0^1\cos(4.79993\,t)\,dt}+8\left(\frac{1-4.79993\int_0^1\sin(4.79993\,t)\,dt}{1+e^{\pi\sqrt{3}}}-\frac{2\left(1-9.59985\int_0^1\sin(9.59985\,t)\,dt\right)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\left(1-14.3998\int_0^1\sin(14.3998\,t)\,dt\right)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)\right)\right)$$

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$4\log_{0.990254}\left(-\left(1\middle/\left(\frac{0.208337}{\int_0^1\cos(4.79993\,t)\,dt}+8\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(\frac{3\,\mathcal{A}^{-51.8384/s+s}\sqrt{\pi}}{2\left(1+e^{3\pi\sqrt{3}}\right)i\pi\sqrt{s}}-\frac{\mathcal{A}^{-23.0393/s+s}\sqrt{\pi}}{\left(-1+e^{2\pi\sqrt{3}}\right)i\pi\sqrt{s}}+\frac{\mathcal{A}^{-5.75982/s+s}\sqrt{\pi}}{2\left(1+e^{\pi\sqrt{3}}\right)i\pi\sqrt{s}}\right)ds-\frac{2}{\pi\sqrt{3}}\right)\right)\right)\text{ for }\gamma>0$$

$$4\log_{0.990254}\left(-\frac{1}{\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)}\right)=$$

$$4\log_{0.990254}\left(-\left(1\middle/\left(\frac{0.208337}{\int_0^1\cos(4.79993\,t)\,dt}+8\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(\frac{2.39996^{-2s}\,\Gamma(s)\sqrt{\pi}}{2\left(1+e^{\pi\sqrt{3}}\right)i\pi\,\Gamma\left(\frac{1}{2}-s\right)}-\frac{4.79993^{-2s}\,\Gamma(s)\sqrt{\pi}}{\left(-1+e^{2\pi\sqrt{3}}\right)i\pi\,\Gamma\left(\frac{1}{2}-s\right)}+\frac{3\times 7.19989^{-2s}\,\Gamma(s)\sqrt{\pi}}{2\left(1+e^{3\pi\sqrt{3}}\right)i\pi\,\Gamma\left(\frac{1}{2}-s\right)}\right)ds-\frac{2}{\pi\sqrt{3}}\right)\right)\right)\text{ for }0<\gamma<\frac{1}{2}$$

From which:

(128.00363329482)-Pi+1/golden ratio

Input interpretation:

$$128.00363329482 - \pi + \frac{1}{\phi}$$

Result:

125.48007462998...

125.48007462998... 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 representations:

$$128.003633294820000 - \pi + \frac{1}{\phi} = 128.003633294820000 - \pi + -\frac{1}{2\cos(216\,°)}$$

$$128.003633294820000 - \pi + \frac{1}{\phi} = 128.003633294820000 - 180\,° + -\frac{1}{2\cos(216\,°)}$$

$$128.003633294820000 - \pi + \frac{1}{\phi} = 128.003633294820000 - \pi + \frac{1}{2\cos\left(\frac{\pi}{5}\right)}$$

Series representations:

$$128.003633294820000 - \pi + \frac{1}{\phi} = 128.003633294820000 + \frac{1}{\phi} - 4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$128.003633294820000 - \pi + \frac{1}{\phi} = 130.003633294820000 + \frac{1}{\phi} - 2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$128.003633294820000 - \pi + \frac{1}{\phi} = 128.003633294820000 + \frac{1}{\phi} - \sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$128.003633294820000-\pi+\frac{1}{\phi}=128.003633294820000+\frac{1}{\phi}-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$128.003633294820000-\pi+\frac{1}{\phi}=128.003633294820000+\frac{1}{\phi}-4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$128.003633294820000-\pi+\frac{1}{\phi}=128.003633294820000+\frac{1}{\phi}-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

and, we obtain also:

(128.00363329482)+11+1/golden ratio

Input interpretation:

$$128.00363329482+11+\frac{1}{\phi}$$

Result:

139.62166728357...

139.62166728357… result practically equal to the rest mass of Pion meson 139.57

Alternative representations:

$$128.003633294820000+11+\frac{1}{\phi}=139.003633294820000+\frac{1}{2\sin(54^{\circ})}$$

$$128.003633294820000+11+\frac{1}{\phi}=139.003633294820000+-\frac{1}{2\cos(216^{\circ})}$$

$$128.003633294820000+11+\frac{1}{\phi}=139.003633294820000+-\frac{1}{2\sin(666^{\circ})}$$

[(((((1/(sin(2*2.399963)) – 2/(Pi*sqrt3) + 8((((cos(2*2.399963))/(e^(Pi*sqrt3)+1)))-((2cos(4*2.399963)/(e^(2Pi*sqrt3)-1)))+((3cos(6*2.399963)/(e^(3Pi*sqrt3)+1)))))))))^24]-123+4

Where 123 and 4 are Lucas numbers

Input interpretation:

$$\left(\frac{1}{\sin(2\times 2.399963)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.399963)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(4\times 2.399963)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(6\times 2.399963)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4$$

Result:

1728.9908238282312118725170299967338925684560963320925946 82...

1728.990823…

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

Alternative representations:

$$\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4=-119+\left(\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{24}$$

$$\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4=-119+\left(\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{24}$$

$$\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4=-119+\left(-\frac{1}{\cos\left(4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{24}$$

Series representations:

$$\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4=-119+\left(\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}+8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\frac{2\sum_{k=0}^{\infty}\frac{(-1)^k\,9.59985^{2k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\,14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)-\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{24}$$

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

$$\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+\right.$$

$$\left.8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-$$

$$123+4=-119+\left(8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\right.\right.$$

$$\frac{2\sum_{k=0}^{\infty}\frac{(-1)^k\,9.59985^{2k}}{(2k)!}}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\left.\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\,14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)+$$

$$\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{1+2k}}{(1+2k)!}}-$$

$$\left.\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{24}$$

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

$$\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4=-119+\left(8\left(\frac{J_0(4.79993)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(4.79993)}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\frac{2\left(J_0(9.59985)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(9.59985)\right)}{-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}+\frac{3\left(J_0(14.3998)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(14.3998)\right)}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)+\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}-\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{24}$$

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

We have also:

1/13*((((([((((((1/(sin(2*2.399963)) – 2/(Pi*sqrt3) + 8((((cos(2*2.399963))/(e^(Pi*sqrt3)+1)))-((2cos(4*2.399963)/(e^(2Pi*sqrt3)-1)))+((3cos(6*2.399963)/(e^(3Pi*sqrt3)+1)))))))))^24]-123+4))))+2Pi

Input interpretation:

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.399963)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.399963)}{e^{\pi\sqrt{3}}+1}-2\times\frac{\cos(4\times 2.399963)}{e^{2\pi\sqrt{3}}-1}+3\times\frac{\cos(6\times 2.399963)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi$$

Result:

139.282...

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

Alternative representations:

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi = 2\pi+\frac{1}{13}\left(-119+\left(\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{24}\right)$$

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi = 2\pi+\frac{1}{13}\left(-119+\left(\frac{1}{\cos\left(-4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{24}\right)$$

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi = 2\pi+\frac{1}{13}\left(-119+\left(-\frac{1}{\cos\left(4.79993+\frac{\pi}{2}\right)}+8\left(\frac{\cosh(-4.79993\,i)}{1+e^{\pi\sqrt{3}}}-\frac{2\cosh(-9.59985\,i)}{-1+e^{2\pi\sqrt{3}}}+\frac{3\cosh(-14.3998\,i)}{1+e^{3\pi\sqrt{3}}}\right)-\frac{2}{\pi\sqrt{3}}\right)^{24}\right)$$

Series representations:

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi=2\pi+\frac{1}{13}\left(-119+\left(\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}+8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\, 4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\left(2\sum_{k=0}^{\infty}\frac{(-1)^k\, 9.59985^{2k}}{(2k)!}\right)\Big/\left(-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\, 14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)-\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{24}\right)\quad\text{for }(x\in\mathbb{R}\text{ and }x<0)$$

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi=$$

$$2\pi+\frac{1}{13}\left(-119+\left(8\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{2k}}{(2k)!}}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\left(2\sum_{k=0}^{\infty}\frac{(-1)^k\,9.59985^{2k}}{(2k)!}\right)\Big/\left(-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+\frac{3\sum_{k=0}^{\infty}\frac{(-1)^k\,14.3998^{2k}}{(2k)!}}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)+\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k\,4.79993^{1+2k}}{(1+2k)!}}-\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{24}\right)\quad\text{for }(x\in\mathbb{R}\text{ and }x<0)$$

$$\frac{1}{13}\left(\left(\frac{1}{\sin(2\times 2.39996)}-\frac{2}{\pi\sqrt{3}}+8\left(\frac{\cos(2\times 2.39996)}{e^{\pi\sqrt{3}}+1}-\frac{2\cos(4\times 2.39996)}{e^{2\pi\sqrt{3}}-1}+\frac{3\cos(6\times 2.39996)}{e^{3\pi\sqrt{3}}+1}\right)\right)^{24}-123+4\right)+2\pi=$$

$$2\pi+\frac{1}{13}\left(-119+\left(8\left(\frac{J_0(4.79993)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(4.79993)}{1+\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}-\left(2\left(J_0(9.59985)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(9.59985)\right)\right)\Big/\left(-1+\exp\left(2\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+\frac{3\left(J_0(14.3998)+2\sum_{k=1}^{\infty}(-1)^k J_{2k}(14.3998)\right)}{1+\exp\left(3\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)+\frac{1}{2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(4.79993)}-\frac{2}{\pi\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\right)^{24}\right)\quad\text{for } (x\in\mathbb{R}\text{ and } x<0)$$

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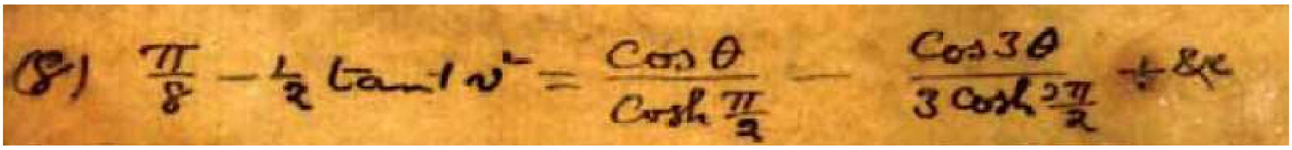


(8) $\frac{\pi}{8}-\frac{1}{2}\tan^{-1}v^2=\frac{\cos\theta}{\cosh\frac{\pi}{2}}-\frac{\cos 3\theta}{3\cosh\frac{3\pi}{2}}+\&c$

For θ = 2.399963, (that is the “golden angle” in radians) we obtain:

cos (2.399963) / cosh(Pi/2) – cos (3*2.399963) / ((3cosh (3*Pi/2)))

Input interpretation:

$$\frac{\cos(2.399963)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.399963)}{3\cosh\left(3\times\frac{\pi}{2}\right)}$$

cosh(x) is the hyperbolic cosine function

Result:

−0.2975121...

-0.2975121…

Alternative representations:

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \frac{\cosh(-2.39996\,i)}{\cos\left(\frac{i\pi}{2}\right)} - \frac{\cosh(-7.19989\,i)}{3\cos\left(\frac{3i\pi}{2}\right)}$$

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \frac{e^{-2.39996\,i}+e^{2.39996\,i}}{2\cos\left(\frac{i\pi}{2}\right)} - \frac{e^{-7.19989\,i}+e^{7.19989\,i}}{2\left(3\cos\left(\frac{3i\pi}{2}\right)\right)}$$

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \frac{\cosh(2.39996\,i)}{\cos\left(-\frac{i\pi}{2}\right)} - \frac{\cosh(7.19989\,i)}{3\cos\left(-\frac{3i\pi}{2}\right)}$$

Series representations:

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = -\frac{-3\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\left(\frac{9}{4}\right)^{k_2}e^{1.75091\,k_1}\pi^{2k_2}}{(2k_1)!\,(2k_2)!} + \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}4^{-k_2}e^{3.94813\,k_1}\pi^{2k_2}}{(2k_1)!\,(2k_2)!}}{3\left(\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^{k}\pi^{2k}}{(2k)!}\right)\sum_{k=0}^{\infty}\frac{4^{-k}\pi^{2k}}{(2k)!}}$$

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \left(-\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\, e^{3.94813\, k_1}\left(\frac{\pi}{2}-\frac{i\pi}{2}\right)^{1+2k_2}}{(2k_1)!\,(1+2k_2)!} + 3\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\, e^{1.75091\, k_1}\left(\frac{3\pi}{2}-\frac{i\pi}{2}\right)^{1+2k_2}}{(2k_1)!\,(1+2k_2)!}\right) \Bigg/ \left(3\, i\left(\sum_{k=0}^{\infty}\frac{\left(\frac{\pi}{2}-\frac{i\pi}{2}\right)^{1+2k}}{(1+2k)!}\right)\sum_{k=0}^{\infty}\frac{\left(\frac{3\pi}{2}-\frac{i\pi}{2}\right)^{1+2k}}{(1+2k)!}\right)$$

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = -\left(\left(-3\, J_0(2.39996)\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^{k}\pi^{2k}}{(2k)!} + J_0(7.19989)\sum_{k=0}^{\infty}\frac{4^{-k}\,\pi^{2k}}{(2k)!} - 6\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\left(\frac{9}{4}\right)^{k_2}\pi^{2k_2}\, J_{2k_1}(2.39996)}{(2k_2)!} + 2\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\, 4^{-k_2}\,\pi^{2k_2}\, J_{2k_1}(7.19989)}{(2k_2)!}\right) \Bigg/ \left(3\left(\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^{k}\pi^{2k}}{(2k)!}\right)\sum_{k=0}^{\infty}\frac{4^{-k}\,\pi^{2k}}{(2k)!}\right)\right)$$

Integral representations:

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{s}\left(\frac{3\, e^{-1.43996/s}}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt} - \frac{e^{-12.9596/s}}{\int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}}\sinh(t)\,dt}\right)\sqrt{\pi}}{6\, i\,\pi\sqrt{s}}\,ds \quad \text{for } \gamma > 0$$

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(s)\left(\frac{3\, e^{-0.364612\, s}}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt} - \frac{e^{-2.56184\, s}}{\int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}}\sinh(t)\,dt}\right)\sqrt{\pi}}{6\, i\,\pi\,\Gamma\left(\frac{1}{2}-s\right)}\,ds$$

$$\text{for } 0 < \gamma < \frac{1}{2}$$

$$\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)} = \int_{-i\infty+\gamma}^{i\infty+\gamma}\left(\frac{e^{-1.43996/s+s}\sqrt{\pi}}{2i\pi\sqrt{s}\left(1+\frac{\pi}{2}\int_0^1 \sinh\left(\frac{\pi t}{2}\right)dt\right)} - \frac{e^{-12.9596/s+s}\sqrt{\pi}}{6i\pi\sqrt{s}\left(1+\frac{3\pi}{2}\int_0^1 \sinh\left(\frac{3\pi t}{2}\right)dt\right)}\right)ds \quad \text{for } \gamma > 0$$

From which:

-Pi*((((cos (2.399963) / cosh(Pi/2) – cos (3*2.399963) / ((3cosh (3*Pi/2)))))))

Input interpretation:

$$-\pi\left(\frac{\cos(2.399963)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.399963)}{3\cosh\left(3\times\frac{\pi}{2}\right)}\right)$$

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

Result:

0.9346620...

0.9346620… 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.

We know that α’ is the Regge slope (string tension). With regard the Omega mesons, the values are:

ω	6	$m_{u/d} = 0 - 60$	$0.910 - 0.918$
ω/ω_3	$5+3$	$m_{u/d} = 255 - 390$	$0.988 - 1.18$
ω/ω_3	$5+3$	$m_{u/d} = 240 - 345$	$0.937 - 1.000$

Input interpretation:

938 MeV (megaelectronvolts)

Unit conversions:

0.938 GeV (gigaelectronvolts)

0.938 GeV result practically equal to the proton mass in GeV

Alternative representations:

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right) = -\pi\left(\frac{\cosh(-2.39996\, i)}{\cos\left(\frac{i\pi}{2}\right)} - \frac{\cosh(-7.19989\, i)}{3\cos\left(\frac{3i\pi}{2}\right)}\right)$$

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right) = -\pi\left(\frac{e^{-2.39996 i} + e^{2.39996 i}}{2\cos\left(\frac{i\pi}{2}\right)} - \frac{e^{-7.19989 i} + e^{7.19989 i}}{2\left(3\cos\left(\frac{3i\pi}{2}\right)\right)}\right)$$

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right) = -\pi\left(\frac{\cosh(2.39996\, i)}{\cos\left(-\frac{i\pi}{2}\right)} - \frac{\cosh(7.19989\, i)}{3\cos\left(-\frac{3i\pi}{2}\right)}\right)$$

Series representations:

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)=$$

$$\frac{\pi\left(-3\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\left(\frac{9}{4}\right)^{k_2}e^{1.75091 k_1}\pi^{2k_2}}{(2k_1)!(2k_2)!}+\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}4^{-k_2}e^{3.94813 k_1}\pi^{2k_2}}{(2k_1)!(2k_2)!}\right)}{3\left(\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^{k}\pi^{2k}}{(2k)!}\right)\sum_{k=0}^{\infty}\frac{4^{-k}\pi^{2k}}{(2k)!}}$$

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)=$$

$$-\left(\left(\pi\left(-\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}e^{3.94813 k_1}\left(\frac{\pi}{2}-\frac{i\pi}{2}\right)^{1+2k_2}}{(2k_1)!(1+2k_2)!}+3\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}e^{1.75091 k_1}\left(\frac{3\pi}{2}-\frac{i\pi}{2}\right)^{1+2k_2}}{(2k_1)!(1+2k_2)!}\right)\right)\Big/\left(3i\left(\sum_{k=0}^{\infty}\frac{\left(\frac{\pi}{2}-\frac{i\pi}{2}\right)^{1+2k}}{(1+2k)!}\right)\sum_{k=0}^{\infty}\frac{\left(\frac{3\pi}{2}-\frac{i\pi}{2}\right)^{1+2k}}{(1+2k)!}\right)\right)$$

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)=$$

$$\left(\pi\left(-3J_0(2.39996)\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^{k}\pi^{2k}}{(2k)!}+J_0(7.19989)\sum_{k=0}^{\infty}\frac{4^{-k}\pi^{2k}}{(2k)!}-6\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\left(\frac{3}{2}\right)^{2k_2}\pi^{2k_2}J_{2k_1}(2.39996)}{(2k_2)!}+2\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}2^{-2k_2}\pi^{2k_2}J_{2k_1}(7.19989)}{(2k_2)!}\right)\right)\Big/\left(3\left(\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^{k}\pi^{2k}}{(2k)!}\right)\sum_{k=0}^{\infty}\frac{4^{-k}\pi^{2k}}{(2k)!}\right)$$

Integral representations:

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)=\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{s}\left(-\frac{3e^{-1.43996/s}}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt}+\frac{e^{-12.9596/s}}{\int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}}\sinh(t)\,dt}\right)\sqrt{\pi}}{6\,i\sqrt{s}}\,ds \quad \text{for } \gamma>0$$

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)=\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(-\frac{e^{-1.43996/s+s}\sqrt{\pi}}{2\,i\sqrt{s}\left(1+\frac{\pi}{2}\int_0^1\sinh\left(\frac{\pi t}{2}\right)dt\right)}+\frac{e^{-12.9596/s+s}\sqrt{\pi}}{6\,i\sqrt{s}\left(1+\frac{3\pi}{2}\int_0^1\sinh\left(\frac{3\pi t}{2}\right)dt\right)}\right)ds \quad \text{for } \gamma>0$$

$$-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)=\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\Gamma(s)\left(-\frac{3e^{-0.364612\,s}}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt}+\frac{e^{-2.56184\,s}}{\int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}}\sinh(t)\,dt}\right)\sqrt{\pi}}{6\,i\,\Gamma\left(\frac{1}{2}-s\right)}\,ds \quad \text{for } 0<\gamma<\frac{1}{2}$$

and:

(((-Pi*((((cos (2.399963) / cosh(Pi/2) – cos (3*2.399963) / ((3cosh (3*Pi/2))))))))))^1/8

Input interpretation:

$$\sqrt[8]{-\pi\left(\frac{\cos(2.399963)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.399963)}{3\cosh\left(3\times\frac{\pi}{2}\right)}\right)}$$

cosh(x) is the hyperbolic cosine function

Result:

0.99158928...

0.99158928... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

We obtain:

16log base 0.99158928(((-Pi*((((cos (2.399963) / cosh(Pi/2) – cos (3*2.399963) / ((3cosh (3*Pi/2)))))))))))-Pi+1/golden ratio

Input interpretation:

$$16 \log_{0.99158928}\left(-\pi\left(\frac{\cos(2.399963)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.399963)}{3\cosh\left(3\times\frac{\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi}$$

Result:

125.476...

125.476... 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 representations:

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} =$$

$$-\pi + \frac{1}{\phi} + \frac{16\log\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(7.19989)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)}{\log(0.991589)}$$

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} =$$
$$-\pi + 16 \log_{0.991589}\left(-\pi\left(\frac{\cosh(-2.39996\, i)}{\cos\left(\frac{i\pi}{2}\right)} - \frac{\cosh(-7.19989\, i)}{3 \cos\left(\frac{3 i \pi}{2}\right)}\right)\right) + \frac{1}{\phi}$$

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} =$$
$$-\pi + 16 \log_{0.991589}\left(-\pi\left(\frac{e^{-2.39996 i} + e^{2.39996 i}}{2 \cos\left(\frac{i\pi}{2}\right)} - \frac{e^{-7.19989 i} + e^{7.19989 i}}{2\left(3 \cos\left(\frac{3 i \pi}{2}\right)\right)}\right)\right) + \frac{1}{\phi}$$

Series representations:

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} =$$
$$\frac{1}{\phi} - \pi - \frac{16 \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1 - \frac{\pi \cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} + \frac{\pi \cos(7.19989)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)^k}{k}}{\log(0.991589)}$$

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} =$$
$$-\frac{-1 + \phi\pi - 16 \phi \log_{0.991589}\left(\frac{\pi \sum_{k=0}^{\infty} \frac{(-1)^k e^{3.94813 k}}{(2k)!}}{3 \sum_{k=0}^{\infty} \frac{\left(\frac{9}{4}\right)^k \pi^{2k}}{(2k)!}} - \frac{\pi \sum_{k=0}^{\infty} \frac{(-1)^k e^{1.75091 k}}{(2k)!}}{\sum_{k=0}^{\infty} \frac{4^{-k} \pi^{2k}}{(2k)!}}\right)}{\phi}$$

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} =$$
$$-\frac{-1 + \phi\pi - 16 \phi \log_{0.991589}\left(-\pi\left(\frac{\sum_{k=0}^{\infty} \frac{(-1)^k e^{1.75091 k}}{(2k)!}}{i \sum_{k=0}^{\infty} \frac{\left(\frac{\pi}{2} - \frac{i\pi}{2}\right)^{1+2k}}{(1+2k)!}} - \frac{\sum_{k=0}^{\infty} \frac{(-1)^k e^{3.94813 k}}{(2k)!}}{3 i \sum_{k=0}^{\infty} \frac{\left(\frac{3\pi}{2} - \frac{i\pi}{2}\right)^{1+2k}}{(1+2k)!}}\right)\right)}{\phi}$$

Integral representations:

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} = -\frac{-1 + \phi\pi - 16\,\phi \log_{0.991589}\left(\frac{\pi \int_{\frac{\pi}{2}}^{2.39996} \sin(t)\,dt}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}} \sinh(t)\,dt} - \frac{\pi \int_{\frac{\pi}{2}}^{7.19989} \sin(t)\,dt}{3 \int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}} \sinh(t)\,dt}\right)}{\phi}$$

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} = -\frac{-1 + \phi\pi - 16\,\phi \log_{0.991589}\left(-\pi \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{s}\left(\frac{3 e^{-1.43996/s}}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}} \sinh(t)\,dt} - \frac{e^{-12.9596/s}}{\int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}} \sinh(t)\,dt}\right)\sqrt{\pi}}{6 i \pi \sqrt{s}}\,ds\right)}{\phi} \quad \text{for } \gamma > 0$$

$$16 \log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.39996)}{3 \cosh\left(\frac{3\pi}{2}\right)}\right)\right) - \pi + \frac{1}{\phi} = -\frac{-1 + \phi\pi - 16\,\phi \log_{0.991589}\left(-\pi\left(\frac{1-2.39996 \int_{0}^{1} \sin(2.39996\,t)\,dt}{\int_{\frac{i\pi}{2}}^{\frac{\pi}{2}} \sinh(t)\,dt} - \frac{1-7.19989 \int_{0}^{1} \sin(7.19989\,t)\,dt}{3 \int_{\frac{i\pi}{2}}^{\frac{3\pi}{2}} \sinh(t)\,dt}\right)\right)}{\phi}$$

And:

16log base 0.99158928(((-Pi*((((cos (2.399963) / cosh(Pi/2) – cos (3*2.399963) / ((3cosh (3*Pi/2)))))))))))+11+1/golden ratio

Input interpretation:

$$16 \log_{0.99158928}\left(-\pi\left(\frac{\cos(2.399963)}{\cosh\left(\frac{\pi}{2}\right)} - \frac{\cos(3 \times 2.399963)}{3 \cosh\left(3 \times \frac{\pi}{2}\right)}\right)\right) + 11 + \frac{1}{\phi}$$

Result:

139.618...

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

Alternative representations:

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}+\frac{16\log\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(7.19989)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)}{\log(0.991589)}$$

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$11+16\log_{0.991589}\left(-\pi\left(\frac{\cosh(-2.39996\,i)}{\cos\left(\frac{i\pi}{2}\right)}-\frac{\cosh(-7.19989\,i)}{3\cos\left(\frac{3i\pi}{2}\right)}\right)\right)+\frac{1}{\phi}$$

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$11+16\log_{0.991589}\left(-\pi\left(\frac{e^{-2.39996i}+e^{2.39996i}}{2\cos\left(\frac{i\pi}{2}\right)}-\frac{e^{-7.19989i}+e^{7.19989i}}{2\left(3\cos\left(\frac{3i\pi}{2}\right)\right)}\right)\right)+\frac{1}{\phi}$$

Series representations:

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-\frac{16\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1-\frac{\pi\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}+\frac{\pi\cos(7.19989)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)^k}{k}}{\log(0.991589)}$$

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$\frac{1+11\phi+16\phi\log_{0.991589}\left(\frac{\pi\sum_{k=0}^{\infty}\frac{(-1)^k e^{3.94813k}}{(2k)!}}{3\sum_{k=0}^{\infty}\frac{\left(\frac{9}{4}\right)^k\pi^{2k}}{(2k)!}}-\frac{\pi\sum_{k=0}^{\infty}\frac{(-1)^k e^{1.75091k}}{(2k)!}}{\sum_{k=0}^{\infty}\frac{4^{-k}\pi^{2k}}{(2k)!}}\right)}{\phi}$$

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$\frac{1+11\,\phi+16\,\phi\log_{0.991589}\left(-\pi\left(\frac{\sum_{k=0}^{\infty}\frac{(-1)^k e^{1.75091\,k}}{(2\,k)!}}{i\sum_{k=0}^{\infty}\frac{\left(\frac{\pi}{2}-\frac{i\,\pi}{2}\right)^{1+2\,k}}{(1+2\,k)!}}-\frac{\sum_{k=0}^{\infty}\frac{(-1)^k e^{3.94813\,k}}{(2\,k)!}}{3\,i\sum_{k=0}^{\infty}\frac{\left(\frac{3\,\pi}{2}-\frac{i\,\pi}{2}\right)^{1+2\,k}}{(1+2\,k)!}}\right)\right)}{\phi}$$

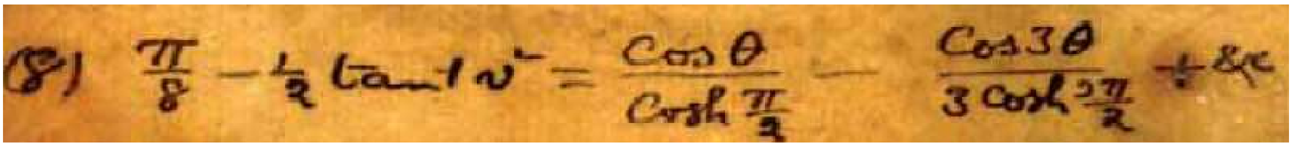
Integral representations:

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$\frac{1+11\,\phi+16\,\phi\log_{0.991589}\left(\frac{\pi\int_{\frac{\pi}{2}}^{2.39996}\sin(t)\,dt}{\int_{\frac{i\,\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt}-\frac{\pi\int_{\frac{\pi}{2}}^{7.19989}\sin(t)\,dt}{3\int_{\frac{i\,\pi}{2}}^{\frac{3\,\pi}{2}}\sinh(t)\,dt}\right)}{\phi}$$

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$\frac{1+11\,\phi+16\,\phi\log_{0.991589}\left(-\pi\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^s\left(\frac{3\,e^{-1.43996/s}}{\int_{\frac{i\,\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt}-\frac{e^{-12.9596/s}}{\int_{\frac{i\,\pi}{2}}^{\frac{3\,\pi}{2}}\sinh(t)\,dt}\right)\sqrt{\pi}}{6\,i\,\pi\sqrt{s}}\,d\,s\right)}{\phi}\quad\text{for }\gamma>0$$

$$16\log_{0.991589}\left(-\pi\left(\frac{\cos(2.39996)}{\cosh\left(\frac{\pi}{2}\right)}-\frac{\cos(3\times 2.39996)}{3\cosh\left(\frac{3\pi}{2}\right)}\right)\right)+11+\frac{1}{\phi}=$$
$$\frac{1+11\,\phi+16\,\phi\log_{0.991589}\left(-\pi\left(\frac{1-2.39996\int_0^1\sin(2.39996\,t)\,dt}{\int_{\frac{i\,\pi}{2}}^{\frac{\pi}{2}}\sinh(t)\,dt}-\frac{1-7.19989\int_0^1\sin(7.19989\,t)\,dt}{3\int_{\frac{i\,\pi}{2}}^{\frac{3\,\pi}{2}}\sinh(t)\,dt}\right)\right)}{\phi}$$

From:



(8) $\frac{\pi}{8} - \frac{1}{2}\tan^{-1} v^2 = \frac{\cos\theta}{\cosh\frac{\pi}{2}} - \frac{\cos 3\theta}{3\cosh\frac{3\pi}{2}} + \&c$

We have:

-0.297512+1/2 tan^-1 (2.27798^2)

Input interpretation:

$$-0.297512 + \frac{1}{2}\tan^{-1}(2.27798^2)$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

0.392699...

(result in radians)

0.392699… = π/8

Input interpretation:

0.392699

Rational form:

$$\frac{392699}{1000000}$$

Possible closed forms:

$$\frac{\pi}{8} \approx 0.3926990816 9$$

Alternative representations:

$$-0.297512 + \frac{1}{2}\tan^{-1}(2.27798^2) = -0.297512 + \frac{\text{sc}^{-1}(2.27798^2 \mid 0)}{2}$$

$$-0.297512 + \frac{1}{2}\tan^{-1}(2.27798^2) = -0.297512 + \frac{1}{2}\cot^{-1}\left(\frac{1}{2.27798^2}\right)$$

$$-0.297512 + \frac{1}{2}\tan^{-1}(2.27798^2) = -0.297512 + \frac{1}{2}\tan^{-1}(1, 2.27798^2)$$

Series representations:

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=$$
$$-0.297512+\frac{1.2973\,\pi}{\sqrt{26.9277}}-0.0963541\sum_{k=0}^{\infty}\frac{(-1)^k\,e^{-3.29316\,k}}{1+2\,k}$$

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=$$
$$-0.297512+0.5\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k\,10.3784^{1+2\,k}\,F_{1+2\,k}\left(\frac{1}{1+\sqrt{22.5422}}\right)^{1+2\,k}}{1+2\,k}$$

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=$$
$$-0.297512+0.5\tan^{-1}(x)-0.5\,\pi\left\lfloor\frac{\arg(i\,(-5.18919+x))}{2\,\pi}\right\rfloor+$$
$$0.25\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-x)^{-k}+(i-x)^{-k}\right)(5.18919-x)^k}{k}\quad\text{for }(i\,x\in\mathbb{R}\text{ and }i\,x>1)$$

Integral representations:

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=-0.297512+2.5946\int_0^1\frac{1}{1+26.9277\,t^2}\,dt$$

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=$$
$$-0.297512-\frac{0.648649\,i}{\pi^{3/2}}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}e^{-3.32962\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds\quad\text{for }0<\gamma<\frac{1}{2}$$

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=$$
$$-0.297512+\frac{0.648649}{i\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-3.29316\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds\quad\text{for }0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)=$$
$$-0.297512+\frac{2.5946}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277\,k^2}{1+2\,k}}=-0.297512+\frac{2.5946}{1+\frac{26.9277}{3+\frac{107.711}{5+\frac{242.35}{7+\frac{430.844}{9+\dots}}}}}$$

$$-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)=-0.297512+\frac{2.5946}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277(1-2k)^2}{27.9277-51.8554k}}=$$

$$-0.297512+\cfrac{2.5946}{1+\cfrac{26.9277}{-23.9277+\cfrac{242.35}{-75.7832+\cfrac{673.193}{-127.639+\cfrac{1319.46}{-179.494+\dots}}}}}$$

$$-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)=$$

$$2.29708-\frac{69.8666}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}=2.29708-\cfrac{69.8666}{3+\cfrac{242.35}{5+\cfrac{107.711}{7+\cfrac{673.193}{9+\cfrac{430.844}{11+\dots}}}}}$$

$$-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)=$$

$$-0.297512+\frac{2.5946}{27.9277+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{53.8554\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(14.4639+13.4639(-1)^k\right)(1+2k)}}=$$

$$-0.297512+\cfrac{2.5946}{27.9277+-\cfrac{53.8554}{3-\cfrac{53.8554}{139.639-\cfrac{323.133}{7-\cfrac{323.133}{251.35+\dots}}}}}$$

Multiplying the result by 4π/3 and adding $3^3/10^3$, and again multiplying all the expression by $1/10^{27}$, we obtain:

1/10^27*[(((-0.297512+1/2 tan^-1 (2.27798^2)))) * 4Pi/3 +3^3/10^3]

Input interpretation:

$$\frac{1}{10^{27}}\left(\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)\times 4\times\frac{\pi}{3}+\frac{3^3}{10^3}\right)$$

$\tan^{-1}(x)$ is the inverse tangent function

Result:

$1.67193\ldots\times 10^{-27}$

(result in radians)

$1.67193\ldots*10^{-27}$ result practically equal to the proton mass

Alternative representations:

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=\frac{\frac{4}{3}\pi\left(-0.297512+\frac{\mathrm{sc}^{-1}(2.27798^2\,|\,0)}{2}\right)+\frac{27}{10^3}}{10^{27}}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=$$
$$\frac{\frac{4}{3}\pi\left(-0.297512+\frac{1}{2}\cot^{-1}\left(\frac{1}{2.27798^2}\right)\right)+\frac{27}{10^3}}{10^{27}}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=$$
$$\frac{\frac{4}{3}\pi\left(-0.297512+\frac{1}{2}\tan^{-1}(1,\,2.27798^2)\right)+\frac{27}{10^3}}{10^{27}}$$

Series representations:

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=2.7\times10^{-29}-$$
$$3.96683\times10^{-28}\,\pi+\frac{1.72973\times10^{-27}\,\pi^2}{\sqrt{26.9277}}-1.28472\times10^{-28}\,\pi\sum_{k=0}^{\infty}\frac{(-1)^k\,e^{-3.29316k}}{1+2k}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=2.7\times10^{-29}-3.96683\times10^{-28}\,\pi+$$
$$6.66667\times10^{-28}\,\pi\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k\,10.3784^{1+2k}\,F_{1+2k}\left(\frac{1}{1+\sqrt{22.5422}}\right)^{1+2k}}{1+2k}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=$$
$$2.7\times10^{-29}-3.96683\times10^{-28}\,\pi+6.66667\times10^{-28}\,\pi\tan^{-1}(x)-$$
$$6.66667\times10^{-28}\,\pi^2\left\lfloor\frac{\arg(i(-5.18919+x))}{2\pi}\right\rfloor+3.33333\times10^{-28}\,i\,\pi$$
$$\sum_{k=1}^{\infty}\frac{\left(-(-i-x)^{-k}+(i-x)^{-k}\right)(5.18919-x)^k}{k}\quad\text{for }(i\,x\in\mathbb{R}\text{ and }i\,x>1)$$

Integral representations:

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}} =$$

$$2.7\times10^{-29}-3.96683\times10^{-28}\,\pi+3.45946\times10^{-27}\,\pi\int_0^1\frac{1}{1+26.9277\,t^2}\,dt$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}} = 2.7\times10^{-29}-3.96683\times10^{-28}\,\pi-$$

$$\frac{8.64865\times10^{-28}\,i}{\sqrt{\pi}}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}e^{-3.32962\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds \quad \text{for } 0<\gamma<\frac{1}{2}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}} = 2.7\times10^{-29}-3.96683\times10^{-28}\,\pi+$$

$$\frac{8.64865\times10^{-28}}{i}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-3.29316\,s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds \quad \text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}} =$$

$$\frac{2.7\times10^{-29}+3.06278\times10^{-27}\,\pi+\left(2.7\times10^{-29}-3.96683\times10^{-28}\,\pi\right)\left(\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277\,k^2}{1+2k}\right)}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277\,k^2}{1+2k}} =$$

$$\frac{9.649\times10^{-27}-1.21922\times10^{-27}\,\cfrac{26.9277}{3+\cfrac{107.711}{5+\cfrac{242.35}{7+\cfrac{430.844}{9+\dots}}}}}{1+\cfrac{26.9277}{3+\cfrac{107.711}{5+\cfrac{242.35}{7+\cfrac{430.844}{9+\dots}}}}}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=$$

$$\left(2.7\times10^{-29}+3.06278\times10^{-27}\pi+\left(2.7\times10^{-29}-3.96683\times10^{-28}\pi\right)\left(\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277(1-2k)^2}{27.9277-51.8554k}\right)\right)\Big/\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277(1-2k)^2}{27.9277-51.8554k}\right)=$$

$$\frac{9.649\times10^{-27}-1.21922\times10^{-27}\,\cfrac{26.9277}{-23.9277+\cfrac{242.35}{-75.7832+\cfrac{673.193}{-127.639+\cfrac{1319.46}{-179.494+\ldots}}}}}{1+\cfrac{26.9277}{-23.9277+\cfrac{242.35}{-75.7832+\cfrac{673.193}{-127.639+\cfrac{1319.46}{-179.494+\ldots}}}}}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}\left(2.27798^2\right)\right)4\pi+\frac{3^3}{10^3}}{10^{27}}=$$

$$\left(8.1\times10^{-29}-8.39671\times10^{-26}\pi+\left(2.7\times10^{-29}+3.06278\times10^{-27}\pi\right)\left(\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277\left(1+(-1)^{1+k}+k\right)^2}{3+2k}\right)\right)\Big/\left(3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{26.9277\left(1+(-1)^{1+k}+k\right)^2}{3+2k}\right)=$$

$$\frac{-2.63709\times10^{-25}+9.649\times10^{-27}\,\cfrac{242.35}{5+\cfrac{107.711}{7+\cfrac{673.193}{9+\cfrac{430.844}{11+\ldots}}}}}{3+\cfrac{242.35}{5+\cfrac{107.711}{7+\cfrac{673.193}{9+\cfrac{430.844}{11+\ldots}}}}}$$

$$\frac{\frac{1}{3}\left(-0.297512+\frac{1}{2}\tan^{-1}(2.27798^2)\right)4\pi+\frac{3^3}{10^3}}{10^{27}} =$$

$$\frac{27}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \pi\left(-3.96683\times10^{-28}+\frac{3.45946\times10^{-27}}{27.9277+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{53.8554\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(14.4639+13.4639(-1)^k\right)(1+2k)}}\right) =$$

$$\frac{27}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \pi\left(-3.96683\times10^{-28}+\frac{3.45946\times10^{-27}}{27.9277+-\frac{53.8554}{3-\frac{53.8554}{139.639-\frac{323.133}{7-\frac{323.133}{251.35+\ldots}}}}}\right)$$

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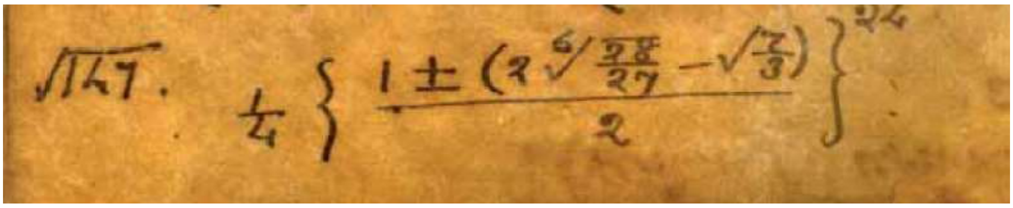


$\sqrt{147}$. $\frac{1}{4}\left\{\frac{1\pm\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)}{2}\right\}^{24}$

sqrt147 1/4[((1+(2*(28/27)^1/6-(7/3)^1/2)*1/2))]^24

Input:

$$\sqrt{147}\times\frac{1}{4}\left(1+\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\times\frac{1}{2}\right)^{24}$$

Result:

$$\frac{7}{4}\sqrt{3}\left(1+\frac{1}{2}\left(\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}-\sqrt{\frac{7}{3}}\right)\right)^{24}$$

Decimal approximation:

553.5763109577611508924497142411420181121205592675804034176...

553.57631095…

Alternate forms:

$$\frac{7\sqrt{3}\left(6+2\sqrt[3]{2}\sqrt{3}\sqrt[6]{7}-\sqrt{21}\right)^{24}}{18\,953\,525\,353\,286\,467\,584}$$

$$\frac{7\left(6+2\sqrt[3]{2}\sqrt{3}\sqrt[6]{7}-\sqrt{21}\right)^{24}}{6\,317\,841\,784\,428\,822\,528\sqrt{3}}$$

$$\frac{7\left(2\sqrt{3}+2\sqrt[3]{2}\sqrt[6]{7}-\sqrt{7}\right)^{24}}{11\,888\,133\,931\,008\sqrt{3}}$$

We obtain also:

1/Pi* sqrt147 1/4[((1+(2*(28/27)^1/6-(7/3)^1/2)*1/2))]^24 - 29-11+3+1/golden ratio

Input:

$$\frac{1}{\pi}\sqrt{147}\left(\frac{1}{4}\left(1+\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\times\frac{1}{2}\right)^{24}\right)-29-11+3+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{1}{\phi}-37+\frac{7\sqrt{3}\left(1+\frac{1}{2}\left(\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}$$

Decimal approximation:

139.8268465237575595423359918238438694689225571185119148748...

139.82684652… result practically equal to the rest mass of Pion meson 139.57

Property:

$$-37+\frac{1}{\phi}+\frac{7\sqrt{3}\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}}{4\pi}$$ is a transcendental number

Alternate forms:

$$\begin{aligned}&\frac{1}{67\,108\,864\,\pi}\Big(-56\,494\,569\,452\,637\,785\sqrt{3}+\\&\quad 6\,475\,173\,025\,186\,656\sqrt[3]{2}\sqrt[6]{7}+20\,749\,964\,390\,355\,984\times 2^{2/3}\sqrt{3}\sqrt[3]{7}+\\&\quad 36\,984\,381\,951\,320\,496\sqrt{7}-1\,412\,997\,045\,166\,896\sqrt[3]{2}\sqrt{3}\;7^{2/3}-\\&\quad 13\,584\,038\,815\,634\,112\times 2^{2/3}\times 7^{5/6}-2\,516\,582\,400\,\pi+33\,554\,432\sqrt{5}\,\pi\Big)\end{aligned}$$

$$\frac{1}{\phi}-37+\frac{7\left(2\sqrt{3}+2\sqrt[3]{2}\sqrt[6]{7}-\sqrt{7}\right)^{24}}{11\,888\,133\,931\,008\sqrt{3}\,\pi}$$

$$\frac{\left(7\sqrt{3}\left(2\sqrt{3}+2\sqrt[3]{2}\sqrt[6]{7}-\sqrt{7}\right)^{24}-1\,319\,582\,866\,341\,888\,\pi\right)\phi+35\,664\,401\,793\,024\,\pi}{35\,664\,401\,793\,024\,\pi\,\phi}$$

Series representations:

$$\frac{\sqrt{147}\left(1+\frac{1}{2}\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-29-11+3+\frac{1}{\phi}=$$
$$-37+\frac{1}{\phi}+\frac{\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}\sqrt{146}\sum_{k=0}^{\infty}146^{-k}\binom{\frac{1}{2}}{k}}{4\pi}$$

$$\frac{\sqrt{147}\left(1+\frac{1}{2}\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-29-11+3+\frac{1}{\phi}=$$
$$-37+\frac{1}{\phi}+\frac{\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}\sqrt{146}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{146}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}}{4\pi}$$

$$\frac{\sqrt{147}\left(1+\frac{1}{2}\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-29-11+3+\frac{1}{\phi}=$$
$$-37+\frac{1}{\phi}+\frac{\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}146^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{8\pi\sqrt{\pi}}$$

And:

1/Pi* sqrt147 1/4[((1+(2*(28/27)^1/6-(7/3)^1/2)*1/2))]^24-47-4

Input:

$$\frac{1}{\pi}\sqrt{147}\left(\frac{1}{4}\left(1+\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\times\frac{1}{2}\right)^{24}\right)-47-4$$

Result:

$$\frac{7\sqrt{3}\left(1+\frac{1}{2}\left(\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-51$$

Decimal approximation:

125.2088125350076646941314049894782313512022479387061520127...

125.2088125… 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

Property:

$$-51+\frac{7\sqrt{3}\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}}{4\pi}$$ is a transcendental number

Alternate forms:

$$\frac{1}{67\,108\,864\,\pi}\Big(-56\,494\,569\,452\,637\,785\sqrt{3}+6\,475\,173\,025\,186\,656\sqrt[3]{2}\sqrt[6]{7}+20\,749\,964\,390\,355\,984\times2^{2/3}\sqrt{3}\sqrt[3]{7}+36\,984\,381\,951\,320\,496\sqrt{7}-1\,412\,997\,045\,166\,896\sqrt[3]{2}\sqrt{3}\,7^{2/3}-13\,584\,038\,815\,634\,112\times2^{2/3}\times7^{5/6}-3\,422\,552\,064\,\pi\Big)$$

$$\frac{7\left(2\sqrt{3}+2\sqrt[3]{2}\sqrt[6]{7}-\sqrt{7}\right)^{24}}{11\,888\,133\,931\,008\sqrt{3}\,\pi}-51$$

$$\frac{7\sqrt{3}\left(1-\frac{\sqrt{\frac{7}{3}}}{2}+\frac{\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)^{24}}{4\pi}-51$$

Series representations:

$$\frac{\sqrt{147}\left(1+\frac{1}{2}\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-47-4=$$
$$-51+\frac{\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}\sqrt{146}\sum_{k=0}^{\infty}146^{-k}\binom{\frac{1}{2}}{k}}{4\pi}$$

$$\frac{\sqrt{147}\left(1+\frac{1}{2}\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-47-4=$$
$$-51+\frac{\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}\sqrt{146}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{146}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}}{4\pi}$$

$$\frac{\sqrt{147}\left(1+\frac{1}{2}\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\right)^{24}}{4\pi}-47-4=$$
$$-51+\frac{\left(1+\frac{1}{2}\left(-\sqrt{\frac{7}{3}}+\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}\right)\right)^{24}\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}146^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{8\pi\sqrt{\pi}}$$

(((1/((((sqrt147 1/4[((1+(2*(28/27)^1/6-(7/3)^1/2)*1/2))]^24)))))))^1/1024

Input:

$$\sqrt[1024]{\frac{1}{\sqrt{147}\times\frac{1}{4}\left(1+\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\times\frac{1}{2}\right)^{24}}}$$

Exact result:

$$\frac{\sqrt[512]{2}}{\sqrt[2048]{3}\,\sqrt[1024]{7}\left(1+\frac{1}{2}\left(\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}-\sqrt{\frac{7}{3}}\right)\right)^{3/128}}$$

Decimal approximation:

0.993850626273740014558241730509119666154385626182676838679...

0.993850626…. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate forms:

$$\frac{2^{13/512}\times 3^{47/2048}}{\sqrt[1024]{7}\left(\boxed{\text{root of } x^6-48384 \text{ near } x=6.03648}+6-\sqrt{21}\right)^{3/128}}$$

$$\frac{2^{13/512}\times 3^{47/2048}}{\sqrt[1024]{7}\left(6+2\sqrt[3]{2}\sqrt{3}\sqrt[6]{7}-\sqrt{21}\right)^{3/128}}$$

$$\frac{2^{13/512}\times 3^{23/2048}}{\sqrt[1024]{7}\left(2\sqrt{3}+2\sqrt[3]{2}\sqrt[6]{7}-\sqrt{7}\right)^{3/128}}$$

(((1/((((sqrt147 1/4[((1+(2*(28/27)^1/6-(7/3)^1/2)*1/2))]^24))))))^1/128

Input:

$$\sqrt[128]{\frac{1}{\sqrt{147}\times\frac{1}{4}\left(1+\left(2\sqrt[6]{\frac{28}{27}}-\sqrt{\frac{7}{3}}\right)\times\frac{1}{2}\right)^{24}}}$$

Exact result:

$$\frac{\sqrt[64]{2}}{\sqrt[256]{3}\,\sqrt[128]{7}\left(1+\frac{1}{2}\left(\frac{2\sqrt[3]{2}\sqrt[6]{7}}{\sqrt{3}}-\sqrt{\frac{7}{3}}\right)\right)^{3/16}}$$

Decimal approximation:

0.951850902028482983268257153140899019695065615404900318306...

0.951850902028… 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:

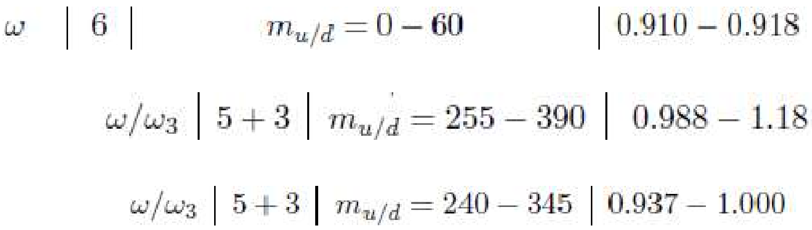
$$\frac{e^{-\frac{\pi}{5}}}{\sqrt{(\varphi-1)\sqrt{5}-\varphi+1}}=1-\cfrac{e^{-\pi}}{1+\cfrac{e^{-2\pi}}{1+\cfrac{e^{-3\pi}}{1+\cfrac{e^{-4\pi}}{1+\ldots}}}}\approx 0.9568666373$$

From:

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

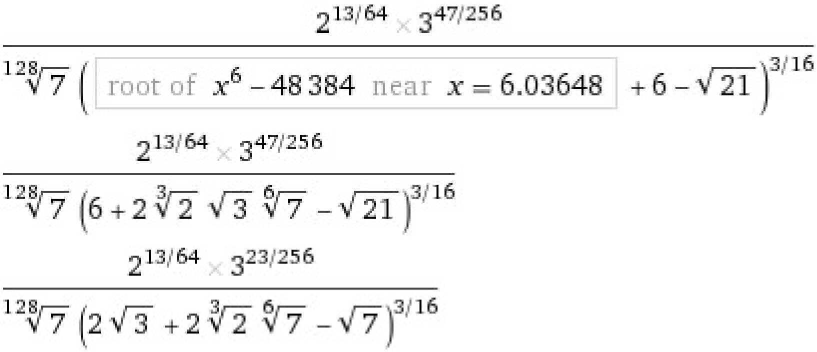
The primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index $n_s = 0.965 \pm 0.004$, consistent with the predictions of slow-roll, single-field, inflation.

We know that α’ is the Regge slope (string tension). With regard the Omega mesons, the values are:



ω	6	$m_{u/d} = 0 - 60$	$0.910 - 0.918$
ω/ω_3	$5+3$	$m_{u/d} = 255 - 390$	$0.988 - 1.18$
ω/ω_3	$5+3$	$m_{u/d} = 240 - 345$	$0.937 - 1.000$

Alternate forms:



$$\frac{2^{13/64}\times 3^{47/256}}{\sqrt[128]{7}\left(\boxed{\text{root of } x^6-48\,384 \text{ near } x=6.03648}+6-\sqrt{21}\right)^{3/16}}$$

$$\frac{2^{13/64}\times 3^{47/256}}{\sqrt[128]{7}\left(6+2\sqrt[3]{2}\sqrt{3}\sqrt[6]{7}-\sqrt{21}\right)^{3/16}}$$

$$\frac{2^{13/64}\times 3^{23/256}}{\sqrt[128]{7}\left(2\sqrt{3}+2\sqrt[3]{2}\sqrt[6]{7}-\sqrt{7}\right)^{3/16}}$$

Conclusion

To conclude we highlight once again, as π, ϕ, 1 / ϕ and 11, or a Lucas number (often in the development of the Ramanujan equations we use Fibonacci and Lucas numbers), they play a fundamental role in the development, and therefore, in the final results of Ramanujan's equations. It always seems more probable that π, ϕ, 1 / ϕ and 11 and other numbers connected to the Fibonacci and Lucas sequences, are not only mathematical constants and / or simple numbers, but "information", which if inserted in the most varied combinations possible following always a precise logic, they lead to the solutions obtained so far: masses of particles (Higgs boson and pion), as described in the paper, and other physical and cosmological parameters.

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References

Manuscript Book Of Srinivasa Ramanujan Volume 2

Andrews, G.E.: Some **formulae for the Fibonacci sequence with generalizations. Fibonacci** Q. **7**, 113–130 (1969) zbMATH Google Scholar

Andrews, G.E.: **A polynomial identity which implies the Rogers–Ramanujan identities**. Scr. Math. **28**, 297–305 (1970) Google Scholar

The Continued Fractions Found in the Unorganized Portions of Ramanujan's Notebooks (Memoirs of the American Mathematical Society), *by Bruce C. Berndt, L. Jacobsen, R. L. Lamphere, George E. Andrews (Editor)*, Srinivasa Ramanujan Aiyangar (Editor) (American Mathematical Society, 1993, ISBN 0-8218-2538-0)