On the Ramanujan mathematics applied to some sectors of String Theory and Particle Physics: Further new possible mathematical connections V.

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Abstract

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

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https://www.storyofmathematics.com/20th_hardy.html

From:

Integrable Scalar Cosmologies

I. Foundations and links with String Theory

P. Fré, A. Sagnotti and A.S. Sorin - arXiv:1307.1910v3 [hep-th] 16 Oct 2013

We have that:

$$\varphi = \frac{2(d-1)}{3(d-2)}\,\phi\ . \qquad (6.13)$$

For d = 6, we obtain:

(2(6-1))/(3(6-2))x = y

Input:

$$\frac{2\,(6-1)}{3\,(6-2)}\,x = y$$

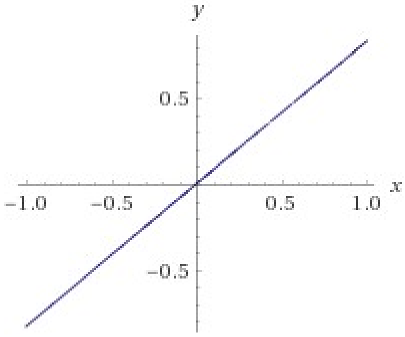
Result:

$$\frac{5\,x}{6} = y$$

Geometric figure:

line

Implicit plot:



Alternate forms:

$x = \frac{6\,y}{5}$

$\frac{5\,x}{6} - y = 0$

Real solution:

$y = \frac{5\,x}{6}$

Solution:

$y = \frac{5\,x}{6}$

Integer solution:

$x = 6\,n, \quad y = 5\,n, \quad n \in \mathbb{Z}$

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

Partial derivatives:

$\frac{\partial}{\partial x}\left(\frac{5\,x}{6}\right) = \frac{5}{6}$

$\frac{\partial}{\partial y}\left(\frac{5\,x}{6}\right) = 0$

(2(6-1))/(3(6-2))6

Input:

$\frac{2\,(6-1)}{3\,(6-2)} \times 6$

Result:

5

5

Thence, we have $\varphi = 5$ and $\phi = 6$

$(\sigma = -1)$

$(\sigma = +1)$

$$\Phi_t = \sqrt{\frac{d-2}{2(d-1)}} \left(\frac{3}{2}\phi - \frac{10-d}{d-2}\sigma\right), \qquad (6.7)$$

$$\Phi_s = \sqrt{\frac{10-d}{2(d-1)}} \left(\frac{1}{2}\phi + 3\sigma\right), \qquad (6.8)$$

((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2))

Input:

$$\sqrt{\frac{6-2}{2(6-1)}} \left(\frac{3}{2}\times 6 - \frac{10-6}{6-2}\right)$$

Result:

$$8\sqrt{\frac{2}{5}}$$

Decimal approximation:

5.059644256269406931198229671092349653951288222920346922972...

5.059644256269….. = Φ_t

Alternate form:

$$\frac{\sqrt{10}\ 8}{5}$$

((10-6)/(2(6-1)))^1/2*(1/2*6+3)

Input:

$$\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)$$

Result:

$$6\sqrt{\frac{2}{5}}$$

Decimal approximation:

3.794733192202055198398672253319262240463466167190260192229...

3.7947331922.... = Φ_s

Alternate form:

$$\frac{\sqrt{10}\ 6}{5}$$

From the sum of the two results, we obtain:

((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) + ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))

Input:

$$\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)+\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)$$

Result:

$$14\sqrt{\frac{2}{5}}$$

Decimal approximation:

8.854377448471462129596901924411611894414754390110607115201...

8.85437744847….

Alternate form:

$$\frac{14\sqrt{10}}{5}$$

From the product:

((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))

Input:

$$\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)$$

Exact result:

$$\frac{96}{5}$$

Decimal form:

19.2

19.2

And:

2*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]^2 + 47-Pi+(((sqrt5+1)/2))

where 47 is a Lucas number

Input:

$$2\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)^2+47-\pi+\frac{1}{2}\left(\sqrt{5}+1\right)$$

Result:

$$\frac{19607}{25}+\frac{1}{2}\left(1+\sqrt{5}\right)-\pi$$

Decimal approximation:

782.7564413351601016097419434510861352335231397804306570411...

782.75644…. result practically equal to the rest mass of Omega meson 782.65

Property:

$\frac{19607}{25}+\frac{1}{2}\left(1+\sqrt{5}\right)-\pi$ is a transcendental number

Alternate forms:

$$\frac{1}{50}\left(39239+25\sqrt{5}-50\pi\right)$$

$$\frac{39239}{50}+\frac{\sqrt{5}}{2}-\pi$$

$$\frac{1}{50}\left(39239+25\sqrt{5}\right)-\pi$$

Series representations:

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2+47-\pi+\frac{1}{2}\left(\sqrt{5}+1\right)=\frac{39239}{50}-\pi+\frac{1}{2}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}$$

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2+47-\pi+\frac{1}{2}\left(\sqrt{5}+1\right)=\frac{39239}{50}-\pi+\frac{1}{2}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}$$

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2+47-\pi+\frac{1}{2}\left(\sqrt{5}+1\right)=\frac{39239}{50}-\pi+\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{4\sqrt{\pi}}$$

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

$n!$ is the factorial function

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

Γ(x) is the gamma function
$\text{Res}_{z=z_0} f$ is a complex residue

2*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]^2-2Pi-3

where 3 is a Fibonacci/Lucas number

Input:

$$2\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)^2-2\pi-3$$

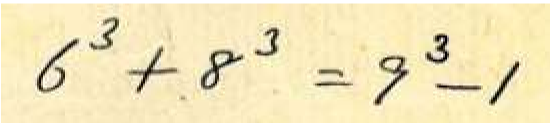
Result:

$$\frac{18357}{25}-2\pi$$

Decimal approximation:

727.99681469282041352307471323344099423160566120124978835 80...

727.996814692… ≈ 728 = 9^3 – 1 that is the following Ramanujan cube:



Property:

$\frac{18357}{25}-2\pi$ is a transcendental number

Alternate form:

$$\frac{1}{25}(18357-50\pi)$$

Series representations:

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3=\frac{18357}{25}-8\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3=$$
$$\frac{18357}{25}+\sum_{k=0}^{\infty}\frac{8(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}$$

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3=$$
$$\frac{18357}{25}-2\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3=$$
$$\frac{18357}{25}-8\int_0^1\sqrt{1-t^2}\,dt$$

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3=$$
$$\frac{18357}{25}-4\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3=$$
$$\frac{18357}{25}-4\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

987+13+2*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]^2-2Pi-3

where 987 and 13 are Fibonacci numbers

Input:

$$987+13+2\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)^2-2\pi-3$$

Result:

$$\frac{43357}{25}-2\pi$$

Decimal approximation:

1727.996814692820413523074713233440994231605661201249788358...

1727.9968146…

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:

$\frac{43357}{25} - 2\pi$ is a transcendental number

Alternate form:

$$\frac{1}{25}(43357 - 50\pi)$$

Series representations:

$$987 + 13 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 = \frac{43357}{25} - 8\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$987 + 13 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 = \frac{43357}{25} + \sum_{k=0}^{\infty}\frac{8(-1)^k\, 1195^{-1-2k}\left(5^{1+2k} - 4\times 239^{1+2k}\right)}{1+2k}$$

$$987 + 13 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 = \frac{43357}{25} - 2\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$987+13+2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3 = \frac{43357}{25}-8\int_0^1\sqrt{1-t^2}\,dt$$

$$987+13+2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3 = \frac{43357}{25}-4\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$987+13+2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2-2\pi-3 = \frac{43357}{25}-4\int_0^\infty\frac{1}{1+t^2}\,dt$$

987+13+55+2*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]^2-2Pi-3

where 55 is a Fibonacci number

Input:

$$987+13+55+2\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)^2-2\pi-3$$

Result:

$$\frac{44732}{25}-2\pi$$

Decimal approximation:

1782.996814692820413523074713233440994231605661201249788358...

1782.9968146… result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

Property:

$\frac{44732}{25}-2\pi$ is a transcendental number

Alternate forms:

$$\frac{2}{25}(22366 - 25\pi)$$

$$-\frac{2}{25}(25\pi - 22366)$$

Series representations:

$$987 + 13 + 55 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 =$$
$$\frac{44732}{25} - 8\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$987 + 13 + 55 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 =$$
$$\frac{44732}{25} + \sum_{k=0}^{\infty}\frac{8(-1)^k\,1195^{-1-2k}\left(5^{1+2k} - 4\times 239^{1+2k}\right)}{1+2k}$$

$$987 + 13 + 55 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 =$$
$$\frac{44732}{25} - 2\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$987 + 13 + 55 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 =$$
$$\frac{44732}{25} - 8\int_0^1\sqrt{1-t^2}\,dt$$

$$987 + 13 + 55 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 =$$
$$\frac{44732}{25} - 4\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$987 + 13 + 55 + 2\left(\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)^2 - 2\pi - 3 =$$
$$\frac{44732}{25} - 4\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

2*144+5+2*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]^2-11-((sqrt5-1)/2)+2/5

where 144 and 5 are Fibonacci numbers, while 11 is a Lucas number

Input:

$$2\times 144+5+2\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)^2-11-\frac{1}{2}\left(\sqrt{5}-1\right)+\frac{2}{5}$$

Result:

$$\frac{25492}{25}+\frac{1}{2}\left(1-\sqrt{5}\right)$$

Decimal approximation:

1019.061966011250105151795413165634361882279690820194237137...

1019.061966… result practically equal to the rest mass of Phi meson 1019.445

Alternate forms:

$$\frac{1}{50}\left(51009-25\sqrt{5}\right)$$

$$\frac{51009}{50}-\frac{\sqrt{5}}{2}$$

Minimal polynomial:

$$625x^2-1275225x+650478739$$

8*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]-13-((sqrt5-1)/2)-2/5

where 8 and 13 are Fibonacci numbers

Input:

$$8\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)-13-\frac{1}{2}\left(\sqrt{5}-1\right)-\frac{2}{5}$$

Result:

$$\frac{701}{5}+\frac{1}{2}\left(1-\sqrt{5}\right)$$

Decimal approximation:

139.5819660112501051517954131656343618822796908201942371378...

139.581966011… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$\frac{1}{10}\left(1407-5\sqrt{5}\right)$$

$$\frac{1407}{10}-\frac{\sqrt{5}}{2}$$

Minimal polynomial:

$$25x^2-7035x+494881$$

8*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]-29+((sqrt5+1)/2)-4/5

where 29 is a Lucas number

Input:

$$8\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)-29+\frac{1}{2}\left(\sqrt{5}+1\right)-\frac{4}{5}$$

Result:

$$\frac{619}{5}+\frac{1}{2}\left(1+\sqrt{5}\right)$$

Decimal approximation:

125.4180339887498948482045868343656381177203091798057628621...

125.4180339887… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$\frac{1}{10}\left(1243+5\sqrt{5}\right)$$

$$\frac{1243}{10}+\frac{\sqrt{5}}{2}$$

Minimal polynomial:

$25x^2 - 6215x + 386231$

(x+11)/10 + sqrt(5)/2 = 125.41803398874989

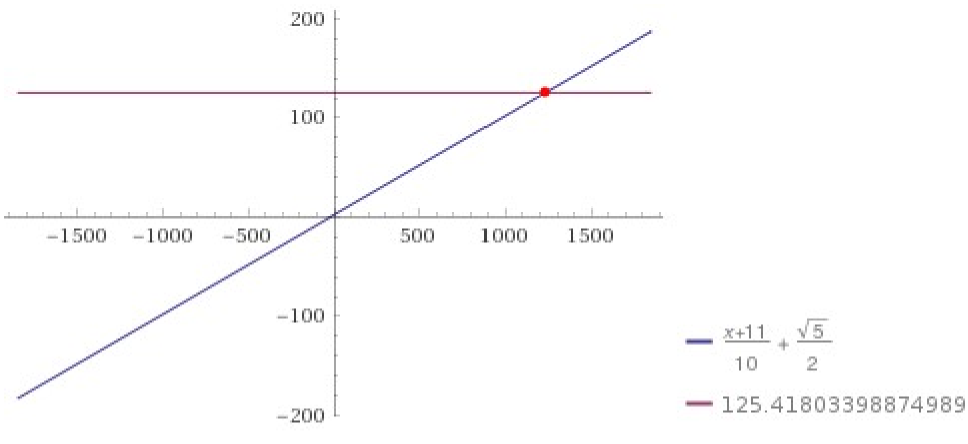
Input interpretation:

$$\frac{x+11}{10} + \frac{\sqrt{5}}{2} = 125.41803398874989$$

Result:

$$\frac{x+11}{10} + \frac{\sqrt{5}}{2} = 125.41803398874989$$

Plot:



Alternate forms:

$$\frac{x}{10} - 123.20000000000000 = 0$$

$$\frac{1}{10}\left(x + 5\sqrt{5} + 11\right) = 125.41803398874989$$

Expanded form:

$$\frac{x}{10} + \frac{\sqrt{5}}{2} + \frac{11}{10} = 125.41803398874989$$

Solution:

$x \approx 1232.000000000000$

Integer solution:

$x = 1232$

1232 result equal to the rest mass of Delta baryon

(377+89+21)*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]-47-e-1/golden ratio

where 377, 89 and 21 are Fibonacci numbers, while 47 is a Lucas number

Input:

$$(377+89+21)\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)-47-e-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$-\frac{1}{\phi}+\frac{46517}{5}-e$$

Decimal approximation:

9300.063684182791059916435125694281699384522443726494277562...

9300.063684… result practically equal to the rest mass of Bottom eta meson 9300

Property:

$\frac{46517}{5}-e-\frac{1}{\phi}$ is a transcendental number

Alternate forms:

$$\frac{1}{10}\left(93039-5\sqrt{5}-10e\right)$$

$$-\frac{-46517\,\phi+5\,e\,\phi+5}{5\,\phi}$$

$$\frac{1}{10}\left(93039-5\sqrt{5}\right)-e$$

Series representations:

$$(377+89+21)\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)-47-e-\frac{1}{\phi}=\frac{46517}{5}-\frac{1}{\phi}-\sum_{k=0}^{\infty}\frac{1}{k!}$$

$$(377+89+21)\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)-47-e-\frac{1}{\phi}=\frac{46502}{5}-\frac{1}{\phi}+\sum_{k=0}^{\infty}\frac{1+k}{(3+k)!}$$

$$(377+89+21)\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2}-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right)-47-e-\frac{1}{\phi}=\frac{46517}{5}-\frac{1}{\phi}-\frac{\sum_{k=0}^{\infty}\frac{-1+k+z}{k!}}{z}$$

(233+89)*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]-34-13-e-1/golden ratio+144

where 233, 89, 34, 13 and 144 are Fibonacci numbers

Input:

$$(233+89)\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)-34-13-e-\frac{1}{\phi}+144$$

ϕ is the golden ratio

Result:

$$-\frac{1}{\phi}+\frac{31397}{5}-e$$

Decimal approximation:

6276.0636841827910599164351256942816993845224437264942775 62...

6276.063684… result practically equal to the rest mass of Charmed B meson 6276

Property:

$\frac{31397}{5} - e - \frac{1}{\phi}$ is a transcendental number

Alternate forms:

$$\frac{1}{10}\left(62799 - 5\sqrt{5} - 10e\right)$$

$$-\frac{-31397\phi + 5e\phi + 5}{5\phi}$$

$$\frac{1}{10}\left(62799 - 5\sqrt{5}\right) - e$$

Series representations:

$$(233+89)\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2} - \frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right) - 34 - 13 - e - \frac{1}{\phi} + 144 = \frac{31397}{5} - \frac{1}{\phi} - \sum_{k=0}^{\infty}\frac{1}{k!}$$

$$(233+89)\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2} - \frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right) - 34 - 13 - e - \frac{1}{\phi} + 144 = \frac{31382}{5} - \frac{1}{\phi} + \sum_{k=0}^{\infty}\frac{1+k}{(3+k)!}$$

$$(233+89)\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3\times 6}{2} - \frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{6}{2}+3\right)\right) - 34 - 13 - e - \frac{1}{\phi} + 144 = \frac{31397}{5} - \frac{1}{\phi} - \frac{\sum_{k=0}^{\infty}\frac{-1+k+z}{k!}}{z}$$

(89+5)*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]+64+1/golden ratio

where 89 and 5 are Fibonacci numbers

Input:

$$(89+5)\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)+64+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{1}{\phi}+\frac{9344}{5}$$

Decimal approximation:

1869.418033988749894848204586834365638117720309179805762862...

1869.41803398… result practically equal to the rest mass of D meson 1869.62

Alternate forms:

$$\frac{1}{10}\left(18683+5\sqrt{5}\right)$$

$$\frac{9344\,\phi+5}{5\,\phi}$$

$$\frac{\sqrt{5}}{2}+\frac{18683}{10}$$

(21+5)*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]-3+golden ratio

where 21, 5 and 3 are Fibonacci numbers

Input:

$$(21+5)\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)-3+\phi$$

ϕ is the golden ratio

Result:

$$\phi+\frac{2481}{5}$$

Decimal approximation:

497.8180339887498948482045868343656381177203091798057628621...

497.81803398… result practically equal to the rest mass of Kaon meson 497.614

Alternate forms:

$$\frac{1}{10}\left(4967+5\sqrt{5}\right)$$

$$\frac{1}{5}(5\phi+2481)$$

$$\frac{4967}{10}+\frac{\sqrt{5}}{2}$$

(144-13)*[((((((6-2)/(2(6-1)))))^1/2 * (3/2*6-(10-6)/(6-2)))) * ((((10-6)/(2(6-1)))^1/2*(1/2*6+3)))]+golden ratio^2

where 144 and 13 are Fibonacci numbers

Input:

$$(144-13)\left(\left(\sqrt{\frac{6-2}{2(6-1)}}\left(\frac{3}{2}\times 6-\frac{10-6}{6-2}\right)\right)\left(\sqrt{\frac{10-6}{2(6-1)}}\left(\frac{1}{2}\times 6+3\right)\right)\right)+\phi^2$$

ϕ is the golden ratio

Result:

$$\phi^2+\frac{12576}{5}$$

Decimal approximation:

2517.818033988749894848204586834365638117720309179805762862...

2517.81803398... result about equal to the rest mass of charmed Sigma baryon 2517.9

Alternate forms:

$$\frac{1}{10}\left(25167+5\sqrt{5}\right)$$

$$\frac{1}{5}\left(5\phi^2+12576\right)$$

$$\frac{25167}{10}+\frac{\sqrt{5}}{2}$$

The two results are:

5.059644256269….. = Φ_t

3.7947331922…. = Φ_s

Now, we have that:

The potential $\mathcal{V}(\varphi) = \mathcal{V}_0 e^{2\gamma\varphi} + \Lambda$

if $\mathcal{V}_0 \geq 0$, $\Lambda \geq 0$:

To begin with, one can notice that independent shifts of Φ_s and Φ_t can turn the general scalar potential resulting from $D9$ and $D3$ branes into the universal form

$$V = V_0 \left(e^{\sqrt{3}\,\Phi_t} + e^{\sqrt{3}\left(\frac{1}{2}\,\Phi_t - \frac{\sqrt{3}}{2}\,\Phi_s\right)} \right) , \tag{6.17}$$

For $V_0 = 1$, we obtain:

(e^(sqrt3*5.0596442562)+e^(sqrt3(1/2*5.0596442562-(sqrt3)/2*3.794733192)))

Input interpretation:

$$e^{\sqrt{3}\times 5.0596442562} + \exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.0596442562 + \frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)$$

Result:

6397.119473...

6397.119473…

We have that from the following 7th order Ramanujan mock theta function

$$\text{(i)} \qquad 1 + \frac{q}{1-q^2} + \frac{q^4}{(1-q^3)(1-q^4)} + \frac{q^9}{(1-q^4)(1-q^5)(1-q^6)} + \ldots$$

From the (i), we have:

0.9239078+0.000433255+(-1.8754140254243246404383299476354805043847163776 × 10^-7)

Input interpretation:

$0.9239078 + 0.000433255 - 1.8754140254243246404383299476354805043847163776 \times 10^{-7}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

0.92434086745859745756753595616700523645194956152836224

Open code

The result is

0.92434086745859745756753595616700523645194956152836224

0.9243408674589...

For V_0 = 0.9243408674589 we obtain:

0.9243408674589(e^(sqrt3*5.0596442562)+e^(sqrt3(1/2*5.0596442562-(sqrt3)/2*3.794733192)))

Input interpretation:

$$0.9243408674589\left(e^{\sqrt{3}\times 5.0596442562}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.0596442562+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)$$

Result:

5913.118963...

5913.118963…

Series representations:

$$0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(3.79473\sqrt{3}\right)/2\right)}\right)=$$
$$0.9243408674589000\left(1.0000000000000000\,e^{5.05964425620000\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.0000000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)\right)$$

$$0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(3.79473\sqrt{3}\right)/2\right)}\right)=$$
$$0.9243408674589000\left(1.0000000000000000\,e^{5.05964425620000\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.0000000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right)$$

$$0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(3.79473\sqrt{3}\right)/2\right)}\right)=$$
$$0.9243408674589000\left(1.0000000000000000\exp\left(5.05964425620000\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)+1.0000000000000000\exp\left(\sqrt{z_0}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\left(2.52982212810000-1.89737\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\right)\right)$$

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

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

$n!$ is the factorial function

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

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

From which:

0.9243408674589(e^(sqrt3*5.0596442562)+e^(sqrt3(1/2*5.0596442562-(sqrt3)/2*3.794733192))) + 29 + Pi where 29 is a Lucas number

Input interpretation:

$$0.9243408674589\left(e^{\sqrt{3}\times 5.0596442562}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.0596442562+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)+29+\pi$$

Result:

5945.260556...

5945.260556... result about equal to the rest mass of bottom Xi baryon 5945.5

Series representations:

$$0.92434086745890000\left(e^{\sqrt{3}\;5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(3.79473\sqrt{3}\right)/2\right)}\right)+29+\pi=0.9243408674589000\left(31.37370749356104+1.0000000000000000\,e^{5.05964425620000\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.0000000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)+1.0818519825365875\,\pi\right)$$

$$0.92434086745890000\left(e^{\sqrt{3}\;5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(3.79473\sqrt{3}\right)/2\right)}\right)+29+\pi=0.9243408674589000\left(31.37370749356104+1.0000000000000000\,e^{5.05964425620000\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.0000000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+1.0818519825365875\,\pi\right)$$

$$0.92434086745890000 \left(e^{\sqrt{3}\ 5.05964425620000} + e^{\sqrt{3}\ \left(5.05964425620000/2-\left(3.79473\sqrt{3}\right)/2\right)}\right) +$$

$$29 + \pi = 0.9243408674589000 \Bigg(31.37370749356104 + 1.0000000000000000$$

$$\exp\left(5.05964425620000\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right) +$$

$$1.0000000000000000 \exp\left(\sqrt{z_0}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right)\right.$$

$$\left.\left(2.52982212810000 - 1.89737\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right)\right) +$$

$$1.0818519825365875\,\pi\Bigg) \text{ for not } ((z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

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

$n!$ is the factorial function

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

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

Now, we have that:

$$V = V_0\left(e^{\sqrt{3}\,\gamma_9\,\Phi_t} + e^{\sqrt{3}\,\gamma_\Lambda\,\Phi_t}\right), \tag{6.18}$$

where

$$\gamma_9 = \sqrt{\frac{d^2 - 14d + 184}{24(d-4)}}, \quad \gamma_\Lambda = -\frac{10}{3}\frac{(d-4)(d-10)}{\sqrt{2(d^2 - 14d + 184)}} \tag{6.19}$$

sqrt(((6^2-14*6+184)/(24(6-4))))

Input:

$$\sqrt{\frac{6^2 - 14\times 6 + 184}{24(6-4)}}$$

Result:

$$\sqrt{\frac{17}{6}}$$

Decimal approximation:

1.683250823060346325560564319511600118433983160746602156975...

1.68325082…

Alternate form:

$$\frac{\sqrt{102}}{6}$$

((-10/3*(6-4)(6-10)))*1/sqrt(2(6^2-14*6+184))

Input:

$$\left(-\frac{10}{3}(6-4)(6-10)\right)\times\frac{1}{\sqrt{2(6^2-14\times6+184)}}$$

Result:

$$\frac{20}{3\sqrt{17}}$$

Decimal approximation:

1.616904166908886490126043080774147852998901657009262915450...

1.6169041669….. result that is a good approximation to the value of the golden ratio 1,618033988749...

Alternate form:

$$\frac{20\sqrt{17}}{51}$$

(((e^(sqrt3*1.68325082*5.059644256269)+e^(sqrt3*1.6169041669*5.0596442562 69)))

Input interpretation:

$$e^{\sqrt{3}\times1.68325082\times5.059644256269}+e^{\sqrt{3}\times1.6169041669\times5.059644256269}$$

Result:

$3.974373497723136048685726296879228952778447036229871 51... \times 10^6$

$3.974373497723136…*10^6$

For V_0 = 0.9243408674589 we obtain:

0.9243408674589((e^(sqrt3*1.68325082*5.059644256269)+e^(sqrt3*1.6169041669*5.059644256269)))

Input interpretation:

$$0.9243408674589\left(e^{\sqrt{3}\times 1.68325082\times 5.059644256269}+e^{\sqrt{3}\times 1.6169041669\times 5.059644256269}\right)$$

Result:

$$3.6736758... \times 10^6$$

3.6736758...*10^6

From the ratio of (6.17) and (6.18), we obtain:

((0.9243408674589(e^(sqrt3*5.0596442562)+e^(sqrt3(1/2*5.0596442562-(sqrt3)/2*3.794733192))))) / ((0.9243408674589((e^(sqrt3*1.68325082*5.059644256269)+e^(sqrt3*1.6169041669*5.059644256269)))))

Input interpretation:

$$\left(0.9243408674589\left(e^{\sqrt{3}\times 5.0596442562}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.0596442562+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)\right)/\left(0.9243408674589\left(e^{\sqrt{3}\times 1.68325082\times 5.059644256269}+e^{\sqrt{3}\times 1.6169041669\times 5.059644256269}\right)\right)$$

Result:

$$0.0016095919...$$

0.0016095919…

Series representations:

$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\ \left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)/$$
$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)=$$
$$\left(1.00000000000000\left(1.000000000000000\,e^{5.05964425620000\ \sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.000000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)\right)\right)/$$
$$\left(1.00000000000000\,e^{8.18095988099300\ \sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\,e^{8.51665\ \sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}\right)$$

$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\ \left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)/$$
$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)=$$
$$\left(1.00000000000000\left(1.000000000000000\,e^{5.05964425620000\ \sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.000000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right)\right)/$$
$$\left(1.00000000000000\,e^{8.18095988099300\ \sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.00000000000000\,e^{8.51665\ \sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)$$

$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\ \left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)/$$
$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)=$$
$$\left(1.00000000000000\left(1.000000000000000\exp\left(5.05964425620000\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)+1.000000000000000\exp\left(\sqrt{z_0}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\left(2.52982212810000-1.89737\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\right)\right)\right)/$$
$$\left(1.00000000000000\exp\left(8.18095988099300\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)+1.00000000000000\exp\left(8.51665\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\right)$$

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

And:

((0.9243408674589((e^(sqrt3*1.68325082*5.059644256269)+e^(sqrt3*1.6169041669*5.059644256269))))) / ((0.9243408674589(e^(sqrt3*5.0596442562)+e^(sqrt3(1/2*5.0596442562-(sqrt3)/2*3.794733192)))))

Input interpretation:

$$\left(0.9243408674589\left(e^{\sqrt{3}\times 1.68325082\times 5.059644256269}+e^{\sqrt{3}\times 1.6169041669\times 5.059644256269}\right)\right)/$$
$$\left(0.9243408674589\left(e^{\sqrt{3}\times 5.0596442562}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.0596442562+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)\right)$$

Result:

621.27548...

621.27548…

Series representations:

$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)\Big/\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)=$$

$$\left(1.00000000000000\left(1.000000000000000\,e^{8.18095988099300\sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.000000000000000\,e^{8.51665\sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}\right)\right)\Big/\left(1.00000000000000\,e^{5.05964425620000\sqrt{2}\ \sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)\right)$$

$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)\Big/\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)=$$

$$\left(1.00000000000000\left(1.000000000000000\,e^{8.18095988099300\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}}+1.000000000000000\,e^{8.51665\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}}\right)\right)\Big/\left(1.00000000000000\,e^{5.05964425620000\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}}+1.00000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)\right)\right)$$

$$\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)\Big/\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)=$$

$$\left(1.00000000000000\left(1.00000000000000\exp\left(\frac{4.09047994049650\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)+1.00000000000000\exp\left(\frac{4.25833\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)\right)\right)\Big/$$

$$\left(1.000000000000000\exp\left(\frac{2.52982212810000\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)+1.000000000000000\exp\left(\frac{1}{\sqrt{\pi}^{2}}\left(1.26491\sqrt{\pi}-0.474342\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)\right)$$

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

$n!$ is the factorial function

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

$\Gamma(x)$ is the gamma function

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

We have also:

1/[1+((((0.9243408674589(e^(sqrt3*5.0596442562)+e^(sqrt3(1/2*5.0596442562-(sqrt3)/2*3.794733192))))) / ((0.9243408674589((e^(sqrt3*1.68325082*5.059644256269)+e^(sqrt3*1.6169041669*5.059644256269))))]

Input interpretation:

$$\frac{1}{1+\frac{0.9243408674589\left(e^{\sqrt{3}\times 5.0596442562}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.0596442562+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)}{0.9243408674589\left(e^{\sqrt{3}\times 1.68325082\times 5.059644256269}+e^{\sqrt{3}\times 1.6169041669\times 5.059644256269}\right)}}$$

Result:

0.99839299470...

0.99839299470…

Series representations:

$$1\Big/\left(1+\left(0.92434086745890000\left(e^{\sqrt{3}\ 5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\right)\Big/\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.0596442562690000}+e^{\sqrt{3}\ 1.61690416690000\times 5.0596442562690000}\right)\right)\right)=$$

$$\left(1.00000000000000\left(1.000000000000000\,e^{8.18095988099300\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.000000000000000\,e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}\right)\right)\Big/\left(1.00000000000000\,e^{5.05964425620000\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\,e^{8.18095988099300\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\,e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)\right)$$

$$1\Big/\Big(1+\Big(0.92434086745890000\left(e^{\sqrt{3}\;5.05964425620000}+e^{\sqrt{3}\left(5.05964425620000/2-\left(\sqrt{3}\;3.79473\right)/2\right)}\right)\Big/\left(0.92434086745890000\left(e^{\sqrt{3}\;1.68325\times 5.0596442562690000}+e^{\sqrt{3}\;1.61690416690000\times 5.0596442562690000}\right)\right)\Big)\Big)=$$

$$\left(1.00000000000000\left(1.000000000000000\,e^{8.18095988099300\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.000000000000000\,e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)\right)\Big/$$

$$\left(1.00000000000000\,e^{5.05964425620000\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.00000000000000\,e^{8.18095988099300\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.00000000000000\,e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.00000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982212810000-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right)$$

$$1 \Big/ \Big(1 + \Big(0.92434086745890000 \left(e^{\sqrt{3}\ 5.05964425620000} + e^{\sqrt{3}\ \left(5.05964425620000/2 - \left(\sqrt{3}\ 3.79473\right)/2\right)}\right)\Big) \Big/ \left(0.92434086745890000 \left(e^{\sqrt{3}\ 1.68325 \times 5.0596442562690000} + e^{\sqrt{3}\ 1.61690416690000 \times 5.0596442562690000}\right)\right)\Big) =$$

$$\left(1.00000000000000 \left(1.000000000000000 \exp\left(\frac{4.09047994049650 \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{\sqrt{\pi}}\right) + 1.000000000000000 \exp\left(\frac{4.25833 \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{\sqrt{\pi}}\right)\right)\right) \Big/$$

$$\left(1.00000000000000 \exp\left(\frac{2.52982212810000 \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{\sqrt{\pi}}\right) + 1.00000000000000 \exp\left(\frac{4.09047994049650 \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{\sqrt{\pi}}\right) + 1.00000000000000 \exp\left(\frac{4.25833 \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)}{\sqrt{\pi}}\right) + 1.00000000000000 \exp\left(\frac{1}{\sqrt{\pi}^2}\left(1.26491 \sqrt{\pi} - 0.474342 \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)\right) \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\, \Gamma\left(-\frac{1}{2}-s\right) \Gamma(s)\right)\right)$$

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

$n!$ is the factorial function

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

$\Gamma(x)$ is the gamma function

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

1/[1+((0.9243408674589(e^(sqrt3*5.05964425)+e^(sqrt3(1/2*5.05964425-(sqrt3)/2*3.794733192))))) / ((0.9243408674589((e^(sqrt3*1.68325082*5.05964425)+e^(sqrt3*1.6169041669*5.05964425)))))]^1/2

Input interpretation:

$$\frac{1}{\sqrt{1+\frac{0.9243408674589\left(e^{\sqrt{3}\times 5.05964425}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.05964425+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)}{0.9243408674589\left(e^{\sqrt{3}\times 1.68325082\times 5.05964425}+e^{\sqrt{3}\times 1.6169041669\times 5.05964425}\right)}}}$$

Result:

0.99919617428...

0.99919617428… result practically equal to the value of the following Rogers-Ramanujan continued fraction:

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

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

Series representations:

$$\frac{1}{\sqrt{1+\frac{0.92434086745890000\left(e^{\sqrt{3}\,5.05964}+e^{\sqrt{3}\,\left(5.05964/2-\left(\sqrt{3}\,3.79473\right)/2\right)}\right)}{0.92434086745890000\left(e^{\sqrt{3}\,1.68325\times 5.05964}+e^{\sqrt{3}\,1.61690416690000\times 5.05964}\right)}}}=$$

$$1\Bigg/\left(\sqrt{\left(1+\left(1.0000000000000000\left(e^{5.05964\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)\right)\right)\Bigg/\left(e^{8.18096\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}\right)\right)}\right)$$

$$\frac{1}{\sqrt{1+\frac{0.92434086745890000\left(e^{\sqrt{3}\ 5.05964}+e^{\sqrt{3}\ \left(5.05964/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)}{0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.05964}+e^{\sqrt{3}\ 1.61690416690000\times 5.05964}\right)}}} =$$

$$1\Big/\left(\sqrt{\left(1+\left(1.0000000000000000\left(e^{5.05964\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right)\right)\Big/\left(e^{8.18096\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)\right)}\right)$$

$$\frac{1}{\sqrt{1+\frac{0.92434086745890000\left(e^{\sqrt{3}\ 5.05964}+e^{\sqrt{3}\ \left(5.05964/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)}{0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.05964}+e^{\sqrt{3}\ 1.61690416690000\times 5.05964}\right)}}} =$$

$$1\Big/\left(\sqrt{\left(1+\left(1.0000000000000000\left(\exp\left(\frac{2.52982\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\,2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)+\exp\left(\frac{1}{2\sqrt{\pi}}\left(\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\,2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)\left(2.52982-\frac{0.948683\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\,2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)\right)\right)\right)\Big/\left(\exp\left(\frac{4.09048\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\,2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)+\exp\left(\frac{4.25833\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}\,2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)\right)\right)}\right)$$

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

$n!$ is the factorial function

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

$\Gamma(x)$ is the gamma function

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

And:

3*[((0.9243408674589((e^(sqrt3*1.68325082*5.05964425)+e^(sqrt3*1.6169041669*5.05964425))))) / ((0.9243408674589(e^(sqrt3*5.05964425)+e^(sqrt3(1/2*5.05964425-(sqrt3)/2*3.794733192)))))]+1/golden ratio

Input interpretation:

$$3\times\left(0.9243408674589\left(e^{\sqrt{3}\times 1.68325082\times 5.05964425}+e^{\sqrt{3}\times 1.6169041669\times 5.05964425}\right)\right)/\left(0.9243408674589\left(e^{\sqrt{3}\times 5.05964425}+\exp\left(\sqrt{3}\left(\frac{1}{2}\times 5.05964425+\frac{\sqrt{3}}{2}\times(-3.794733192)\right)\right)\right)\right)+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1864.444...

1864.444… result almost equal to the rest mass of D meson 1864.84

Series representations:

$$\frac{3\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.05964}+e^{\sqrt{3}\ 1.61690416690000\times 5.05964}\right)\right)}{0.92434086745890000\left(e^{\sqrt{3}\ 5.05964}+e^{\sqrt{3}\left(5.05964/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)}+\frac{1}{\phi}=$$

$$\left(1.00000000000000\left(1.00000000000000\,e^{5.05964\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)+3.00000000000000\,e^{8.18096\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}\phi+3.00000000000000\,e^{8.51665\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}\phi\right)\right)/\left(\left(1.00000000000000\,e^{5.05964\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{1/2}{k}}+1.00000000000000\exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\left(2.52982-1.89737\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)\right)\right)\phi\right)$$

$$\frac{3\left(0.92434086745890000\left(e^{\sqrt{3}\ 1.68325\times 5.05964}+e^{\sqrt{3}\ 1.61690416690000\times 5.05964}\right)\right)}{0.92434086745890000\left(e^{\sqrt{3}\ 5.05964}+e^{\sqrt{3}\ \left(5.05964/2-\left(\sqrt{3}\ 3.79473\right)/2\right)}\right)}+\frac{1}{\phi}=$$

$$\left(1.00000000000000\left(1.00000000000000\, e^{5.05964\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.00000000000000\ \exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+3.00000000000000\, e^{8.18096\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\phi+3.00000000000000\, e^{8.51665\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\phi\right)\right)\Big/$$

$$\left(\left(1.00000000000000\, e^{5.05964\sqrt{2}\ \sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}+1.00000000000000\ \exp\left(\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(2.52982-1.89737\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\right)\phi\right)$$

$$\frac{3\left(0.92434086745890000\left(e^{\sqrt{3}\;1.68325\times 5.05964}+e^{\sqrt{3}\;1.61690416690000\times 5.05964}\right)\right)}{0.92434086745890000\left(e^{\sqrt{3}\;5.05964}+e^{\sqrt{3}\left(5.05964/2-\left(\sqrt{3}\;3.79473\right)/2\right)}\right)}+\frac{1}{\phi}=$$

$$\Bigg(1.00000000000000\Bigg(1.00000000000000\exp\left(5.05964\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)+$$
$$1.00000000000000\exp\left(\sqrt{z_0}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\left(2.52982-1.89737\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\right)+$$
$$3.00000000000000\exp\left(8.18096\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\phi+$$
$$3.00000000000000\exp\left(8.51665\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\phi\Bigg)\Bigg)\Big/$$
$$\Bigg(\Bigg(1.00000000000000\exp\left(5.05964\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)+$$
$$1.00000000000000\exp\left(\sqrt{z_0}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\left(2.52982-1.89737\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}\right)\right)\Bigg)\phi\Bigg)$$

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

Now, we have that:

$$\frac{dy}{dx}=\frac{\arctan\left(\frac{y}{x}\right)}{\log\sqrt{x^2+y^2}+\sqrt{\left(\log\sqrt{x^2+y^2}\right)^2+\left(\arctan\left(\frac{y}{x}\right)\right)^2}},\qquad(4.259)$$

which clearly tends to zero for large values of x and y, so that indeed $\varphi\to+\infty$. Notice that a cosmological term Λ would displace $\frac{y}{x}$ in the argument of the inner arctan to $\frac{y}{x}+\alpha\Lambda$, with α positive. If $\Lambda>0$ the contour still flattens so that x/y grows and $\varphi\to\infty$ at late times. However, if $\Lambda<0$ the slope at some point changes sign and y is driven to zero, which signals the expected Big Crunch.

For y = 144, x = 89 (that are Fibonacci numbers) we obtain:

atan(144/89) * 1/((((ln sqrt(89^2+144^2))+((((ln sqrt(89^2+144^2))^2+(atan(144/89))^2)))^1/2)))

Input:

$$\tan^{-1}\left(\frac{144}{89}\right)\times\frac{1}{\log\left(\sqrt{89^2+144^2}\right)+\sqrt{\log^2\left(\sqrt{89^2+144^2}\right)+\tan^{-1}\left(\frac{144}{89}\right)^2}}$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$\frac{\tan^{-1}\left(\frac{144}{89}\right)}{\frac{\log(28657)}{2}+\sqrt{\frac{\log^2(28657)}{4}+\tan^{-1}\left(\frac{144}{89}\right)^2}}$$

(result in radians)

Decimal approximation:

0.0981575232504486599057387960192564243986577195005386859 26...

(result in radians)

0.09815752325….

Alternate forms:

$$\frac{2\tan^{-1}\left(\frac{144}{89}\right)}{\log(28657)+\sqrt{\log^2(28657)+4\tan^{-1}\left(\frac{144}{89}\right)^2}}$$

$$\frac{i\left(\log\left(1-\frac{144i}{89}\right)-\log\left(1+\frac{144i}{89}\right)\right)}{2\left(\frac{\log(28657)}{2}+\sqrt{\frac{\log^2(28657)}{4}-\frac{1}{4}\left(\log\left(1-\frac{144i}{89}\right)-\log\left(1+\frac{144i}{89}\right)\right)^2}\right)}$$

Alternative representations:

$$\frac{\tan^{-1}\left(\frac{144}{89}\right)}{\log\left(\sqrt{89^2+144^2}\right)+\sqrt{\log^2\left(\sqrt{89^2+144^2}\right)+\tan^{-1}\left(\frac{144}{89}\right)^2}}=$$

$$\frac{\tan^{-1}\left(1,\frac{144}{89}\right)}{\log\left(\sqrt{89^2+144^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{144}{89}\right)^2+\log^2\left(\sqrt{89^2+144^2}\right)}}$$

$$\frac{\tan^{-1}\left(\frac{144}{89}\right)}{\log\left(\sqrt{89^2+144^2}\right)+\sqrt{\log^2\left(\sqrt{89^2+144^2}\right)+\tan^{-1}\left(\frac{144}{89}\right)^2}} = \frac{\tan^{-1}\left(\frac{144}{89}\right)}{\log_e\left(\sqrt{89^2+144^2}\right)+\sqrt{\tan^{-1}\left(\frac{144}{89}\right)^2+\log_e^2\left(\sqrt{89^2+144^2}\right)}}$$

$$\frac{\tan^{-1}\left(\frac{144}{89}\right)}{\log\left(\sqrt{89^2+144^2}\right)+\sqrt{\log^2\left(\sqrt{89^2+144^2}\right)+\tan^{-1}\left(\frac{144}{89}\right)^2}} = \frac{\tan^{-1}\left(1, \frac{144}{89}\right)}{\log_e\left(\sqrt{89^2+144^2}\right)+\sqrt{\tan^{-1}\left(1, \frac{144}{89}\right)^2+\log_e^2\left(\sqrt{89^2+144^2}\right)}}$$

Series representation:

$$\frac{\tan^{-1}\left(\frac{144}{89}\right)}{\log\left(\sqrt{89^2+144^2}\right)+\sqrt{\log^2\left(\sqrt{89^2+144^2}\right)+\tan^{-1}\left(\frac{144}{89}\right)^2}} = \left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{144}{89}-z_0\right)^k}{k}\right) \Bigg/ \left(\log(28\,656)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{28\,656}\right)^k}{k}+2\sqrt{\left(\frac{1}{4}\left(\log(28\,656)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{28\,656}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{144}{89}-z_0\right)^k}{k}\right)^2\right)}\right)$$

for $(i z_0 \notin \mathbb{R}$ or $($ not $(1 \le i z_0 < \infty)$ and not $(-\infty < i z_0 \le -1)))$

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

For y = 8, x = 5 (that are Fibonacci numbers) we obtain:

atan(8/5) * 1/((((ln sqrt(5^2+8^2))+((((ln sqrt(5^2+8^2))^2+(atan(8/5))^2)))^1/2)))

Input:

$$\tan^{-1}\left(\frac{8}{5}\right)\times\frac{1}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}}$$

$\tan^{-1}(x)$ is the inverse tangent function
$\log(x)$ is the natural logarithm

Exact Result:

$$\frac{\tan^{-1}\left(\frac{8}{5}\right)}{\frac{\log(89)}{2}+\sqrt{\frac{\log^2(89)}{4}+\tan^{-1}\left(\frac{8}{5}\right)^2}}$$

(result in radians)

Decimal approximation:

0.215071362395606031430139199289691497266228918734609327741...

(result in radians)

0.215071362395606….

Alternate forms:

$$\frac{2\tan^{-1}\left(\frac{8}{5}\right)}{\log(89)+\sqrt{\log^2(89)+4\tan^{-1}\left(\frac{8}{5}\right)^2}}$$

$$\frac{i\left(\log\left(1-\frac{8i}{5}\right)-\log\left(1+\frac{8i}{5}\right)\right)}{2\left(\frac{\log(89)}{2}+\sqrt{\frac{\log^2(89)}{4}-\frac{1}{4}\left(\log\left(1-\frac{8i}{5}\right)-\log\left(1+\frac{8i}{5}\right)\right)^2}\right)}$$

Alternative representations:

$$\frac{\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}} = \frac{\tan^{-1}\left(1,\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{8}{5}\right)^2+\log^2\left(\sqrt{5^2+8^2}\right)}}$$

$$\frac{\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}} = \frac{\tan^{-1}\left(\frac{8}{5}\right)}{\log_e\left(\sqrt{5^2+8^2}\right)+\sqrt{\tan^{-1}\left(\frac{8}{5}\right)^2+\log_e^2\left(\sqrt{5^2+8^2}\right)}}$$

$$\frac{\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}} = \frac{\tan^{-1}\left(1, \frac{8}{5}\right)}{\log_e\left(\sqrt{5^2+8^2}\right)+\sqrt{\tan^{-1}\left(1, \frac{8}{5}\right)^2+\log_e^2\left(\sqrt{5^2+8^2}\right)}}$$

Series representation:

$$\frac{\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}} = \left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{8}{5}-z_0\right)^k}{k}\right) \Bigg/ \left(\log(88)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{88}\right)^k}{k}+2\sqrt{\frac{1}{4}\left(\log(88)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{88}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{8}{5}-z_0\right)^k}{k}\right)^2}\right)$$

for $(i z_0 \notin \mathbb{R}$ or (not $(1 \leq i z_0 < \infty)$ and not $(-\infty < i z_0 \leq -1)))$

1/(((7*(((atan(8/5) * 1/((((ln sqrt(5^2+8^2))+((((ln sqrt(5^2+8^2))^2+(atan(8/5))^2)))^1/2)))))))))

where 7 is a Lucas number

Input:

$$\frac{1}{7\left(\tan^{-1}\left(\frac{8}{5}\right)\times\frac{1}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}}\right)}$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$\frac{\frac{\log(89)}{2}+\sqrt{\frac{\log^2(89)}{4}+\tan^{-1}\left(\frac{8}{5}\right)^2}}{7\tan^{-1}\left(\frac{8}{5}\right)}$$

(result in radians)

Decimal approximation:

0.664231356819923454615359246608224462981367973844637840413...

(result in radians)

0.6642313568…

Alternate forms:

$$\frac{\log(89)+\sqrt{\log^2(89)+4\tan^{-1}\left(\frac{8}{5}\right)^2}}{14\tan^{-1}\left(\frac{8}{5}\right)}$$

$$\frac{\sqrt{\frac{\log^2(89)}{4}+\tan^{-1}\left(\frac{8}{5}\right)^2}}{7\tan^{-1}\left(\frac{8}{5}\right)}+\frac{\log(89)}{14\tan^{-1}\left(\frac{8}{5}\right)}$$

$$-\frac{2i\sqrt{\frac{\log^2(89)}{4}-\frac{1}{4}\left(\log\left(1-\frac{8i}{5}\right)-\log\left(1+\frac{8i}{5}\right)\right)^2}}{7\left(\log\left(1-\frac{8i}{5}\right)-\log\left(1+\frac{8i}{5}\right)\right)}-\frac{i\log(89)}{7\left(\log\left(1-\frac{8i}{5}\right)-\log\left(1+\frac{8i}{5}\right)\right)}$$

Alternative representations:

$$\frac{1}{\frac{7\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}}}=\frac{1}{\frac{7\tan^{-1}\left(1,\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{8}{5}\right)^2+\log^2\left(\sqrt{5^2+8^2}\right)}}}$$

$$\frac{1}{\frac{7\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}}}=\frac{1}{\frac{7\tan^{-1}\left(\frac{8}{5}\right)}{\log_e\left(\sqrt{5^2+8^2}\right)+\sqrt{\tan^{-1}\left(\frac{8}{5}\right)^2+\log_e^2\left(\sqrt{5^2+8^2}\right)}}}$$

$$\frac{1}{\frac{7\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}}}=\frac{1}{\frac{7\tan^{-1}\left(1,\frac{8}{5}\right)}{\log_e\left(\sqrt{5^2+8^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{8}{5}\right)^2+\log_e^2\left(\sqrt{5^2+8^2}\right)}}}$$

Series representation:

$$\frac{1}{\frac{7\tan^{-1}\left(\frac{8}{5}\right)}{\log\left(\sqrt{5^2+8^2}\right)+\sqrt{\log^2\left(\sqrt{5^2+8^2}\right)+\tan^{-1}\left(\frac{8}{5}\right)^2}}} =$$

$$\left(\log(88)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{88}\right)^k}{k}+2\sqrt{\left(\frac{1}{4}\left(\log(88)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{88}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{8}{5}-z_0\right)^k}{k}\right)^2\right)}\right) /$$

$$\left(7\left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{8}{5}-z_0\right)^k}{k}\right)\right)$$

for ($i z_0 \notin \mathbb{R}$ or (not ($1 \leq i z_0 < \infty$) and not ($-\infty < i z_0 \leq -1$)))

For y = 4096 = 64^2 and x = 2304 = 48^2, we obtain:

[atan(4096/2304) * 1/((((ln sqrt(2304^2+4096^2))+((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/2)))]

Input:

$$\tan^{-1}\left(\frac{4096}{2304}\right)\times\frac{1}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$\frac{\tan^{-1}\left(\frac{16}{9}\right)}{\log(256\sqrt{337})+\sqrt{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}}$$

(result in radians)

Decimal approximation:

0.062345686523848593389829477150855610035009036144693460916...

(result in radians)

0.0623456865…

Alternate forms:

$$\frac{2\tan^{-1}\left(\frac{16}{9}\right)}{\log(22\,085\,632)+\sqrt{\log^2(22\,085\,632)+4\tan^{-1}\left(\frac{16}{9}\right)^2}}$$

$$\frac{\tan^{-1}\left(\frac{16}{9}\right)}{\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}}$$

$$\frac{2\tan^{-1}\left(\frac{16}{9}\right)}{16\log(2)+\log(337)+\sqrt{(16\log(2)+\log(337))^2+4\tan^{-1}\left(\frac{16}{9}\right)^2}}$$

Alternative representations:

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}=\frac{\tan^{-1}\left(1,\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{4096}{2304}\right)^2+\log^2\left(\sqrt{2304^2+4096^2}\right)}}$$

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}=\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}$$

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}=\frac{\tan^{-1}\left(1,\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}$$

Series representation:

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}} =$$

$$\left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)\Bigg/\left(2\log\left(-1+256\sqrt{337}\right)-2\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+2\sqrt{\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2}\right)$$

for ($i z_0 \notin \mathbb{R}$ or (not ($1 \leq i z_0 < \infty$) and not ($-\infty < i z_0 \leq -1$)))

1/[atan(4096/2304) * 1/((((ln sqrt(2304^2+4096^2))+((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/2)))]

Input:

$$\frac{1}{\tan^{-1}\left(\frac{4096}{2304}\right)\times\frac{1}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$\frac{\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\tan^{-1}\left(\frac{16}{9}\right)}$$

(result in radians)

Decimal approximation:

16.039602027920216310417023838352657606078639514232636952 22...

(result in radians)

16.039602027…

Alternate forms:

$$\frac{\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\tan^{-1}\left(\frac{16}{9}\right)}$$

$$\frac{16\log(2)+\log(337)+\sqrt{(16\log(2)+\log(337))^2+4\tan^{-1}\left(\frac{16}{9}\right)^2}}{2\tan^{-1}\left(\frac{16}{9}\right)}$$

$$\frac{\sqrt{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\tan^{-1}\left(\frac{16}{9}\right)}+\frac{\log(256\sqrt{337})}{\tan^{-1}\left(\frac{16}{9}\right)}$$

Alternative representations:

$$\frac{1}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}=\frac{1}{\frac{\tan^{-1}\left(1,\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{4096}{2304}\right)^2+\log^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

$$\frac{1}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}=\frac{1}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

$$\frac{1}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}=\frac{1}{\frac{\tan^{-1}\left(1,\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

Series representation:

$$\frac{1}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}} =$$

$$\left(2\log\left(-1+256\sqrt{337}\right)-2\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+2\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}\right) / \left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)$$

for ($i z_0 \notin \mathbb{R}$ or (not $(1 \leq i z_0 < \infty)$ and not $(-\infty < i z_0 \leq -1)$))

64/[atan(4096/2304) * 1/((((ln sqrt(2304^2+4096^2))+((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/2)))]-5-golden ratio

where 5 is a Fibonacci number

Input:

$$\frac{64}{\tan^{-1}\left(\frac{4096}{2304}\right)\times\frac{1}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}-5-\phi$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact Result:

$$-\phi - 5 + \frac{64\left(\log(256\sqrt{337}) + \sqrt{\log^2(256\sqrt{337}) + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

(result in radians)

Decimal approximation:

1019.916495798143949018484938820204448671312619731083002080...

(result in radians)

1019.9164957… result almost equal to the rest mass of Phi meson 1019.445

Alternate forms:

$$-\phi - 5 + \frac{32\left(\log(22\,085\,632) + \sqrt{\log^2(22\,085\,632) + 4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

$$-\phi - 5 + \frac{32\left(16\log(2) + \log(337) + \sqrt{(16\log(2) + \log(337))^2 + 4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

$$-5 + \frac{1}{2}\left(-1 - \sqrt{5}\right) + \frac{64\left(\log(256) + \frac{\log(337)}{2} + \sqrt{\left(\log(256) + \frac{\log(337)}{2}\right)^2 + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

Alternative representations:

$$\frac{64}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}} - 5 - \phi = -5 - \phi + \frac{64}{\frac{\tan^{-1}\left(1, \frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

$$\frac{64}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}} - 5 - \phi =$$

$$-5 - \phi + \frac{64}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

$$\frac{64}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}} - 5 - \phi =$$

$$-5 - \phi + \frac{64}{\frac{\tan^{-1}\left(1, \frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

Series representation:

$$\frac{64}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}-5-\phi=$$

$$-\left(\left(22\tan^{-1}(z_0)+2\sqrt{5}\tan^{-1}(z_0)-\right.\right.$$
$$256\log\left(-1+256\sqrt{337}\right)+256\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}-$$
$$256\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}+$$
$$11i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}+$$
$$\left.i\sqrt{5}\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)\Bigg/$$
$$\left.\left(2\left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)\right)\right)$$

for $(i z_0 \notin \mathbb{R}$ or (not $(1 \le i z_0 < \infty)$ and not $(-\infty < i z_0 \le -1))$)

And:

48/[atan(4096/2304) * 1/((((ln sqrt(2304^2+4096^2))+((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/2)))]+13

where 13 is a Fibonacci number

Input:

$$\frac{48}{\tan^{-1}\left(\frac{4096}{2304}\right)\times\frac{1}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}+13$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$13 + \frac{48\left(\log(256\sqrt{337}) + \sqrt{\log^2(256\sqrt{337}) + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

(result in radians)

Decimal approximation:

782.9008973401703829000171442409275650917746966831665737068...

(result in radians)

782.90089734… result almost equal to the rest mass of Omega meson 782.65

Alternate forms:

$$13 + \frac{24\left(\log(22085632) + \sqrt{\log^2(22085632) + 4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

$$13 + \frac{24\left(16\log(2) + \log(337) + \sqrt{(16\log(2) + \log(337))^2 + 4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

$$13 + \frac{48\left(\log(256) + \frac{\log(337)}{2} + \sqrt{\left(\log(256) + \frac{\log(337)}{2}\right)^2 + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)}{\tan^{-1}\left(\frac{16}{9}\right)}$$

Alternative representations:

$$\frac{48}{\dfrac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}} + 13 = 13 + \frac{48}{\dfrac{\tan^{-1}\left(1, \frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

$$\frac{48}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}+13 = 13+\frac{48}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

$$\frac{48}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}+13 = 13+\frac{48}{\frac{\tan^{-1}\left(1,\frac{4096}{2304}\right)}{\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1,\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}}$$

Series representation:

$$\frac{48}{\frac{\tan^{-1}\left(\frac{4096}{2304}\right)}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}}+13 =$$

$$\left(26\tan^{-1}(z_0)+96\log\left(-1+256\sqrt{337}\right)-96\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+ 96\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}+13i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)\Bigg/\left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)$$

for $(i z_0 \notin \mathbb{R}$ or (not $(1 \leq i z_0 < \infty)$ and not $(-\infty < i z_0 \leq -1)))$

We have also, from:

$$\frac{dy}{dx} = \frac{\arctan\left(\frac{y}{x}\right)}{\log\sqrt{x^2+y^2} + \sqrt{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}}, \qquad (4.259)$$

and

[atan(4096/2304) * 1/((((ln sqrt(2304^2+4096^2))+((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/2)))]

$$\tan^{-1}\left(\frac{4096}{2304}\right)\times\frac{1}{\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}$$

= 0.06234568652

$$\frac{dy}{dx} = \frac{\arctan\left(\frac{y}{x}\right)}{\log\sqrt{x^2+y^2} + \sqrt{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}}, \qquad (4.259)$$

[((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/4]/[sqrt(1+0.06234568652^2)]

One can actually turn the (complex) integrable system into the set of coupled first–order differential equations

$$\frac{dx}{dt} = \frac{\sqrt[4]{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}}{\sqrt{1 + \left(\frac{\arctan\left(\frac{y}{x}\right)}{\log\sqrt{x^2+y^2} + \sqrt{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}}\right)^2}}, \qquad (4.261)$$

$$\frac{dy}{dt} = \frac{\arctan\left(\frac{y}{x}\right)\sqrt[4]{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}}{\sqrt{\left(\log\sqrt{x^2+y^2} + \sqrt{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}},$$

the second of which is obtained combining the first with eq. (4.259), or alternatively one can recast this system in terms of the cosmic time t_c.

For y = 4096, x = 2304 and

$$\frac{dy}{dx} = \frac{\arctan\left(\frac{y}{x}\right)}{\log\sqrt{x^2+y^2} + \sqrt{\left(\log\sqrt{x^2+y^2}\right)^2 + \left(\arctan\left(\frac{y}{x}\right)\right)^2}}, \qquad (4.259)$$

We obtain:

[((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/4]/[sqrt(1+0.06234568652^2)]

Input interpretation:

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.06234568652^2}}$$

log(x) is the natural logarithm

$\tan^{-1}(x)$ is the inverse tangent function

Result:

2.91345369982...

(result in radians)

2.91345369982…

Alternative representations:

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} = \frac{\sqrt[4]{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log^2\left(\sqrt{2304^2+4096^2}\right)}}{\sqrt{1+0.0623457^2}}$$

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} = \frac{\sqrt[4]{\tan^{-1}\left(\frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}{\sqrt{1+0.0623457^2}}$$

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} = \frac{\sqrt[4]{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}}{\sqrt{1+0.0623457^2}}$$

Series representations:

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} =$$

$$\left(\left(\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 32^{1+2k} F_{1+2k}\left(\frac{1}{9+9\sqrt{\frac{1429}{405}}}\right)^{1+2k}}{1+2k}\right)^2 + \left(\log\left(-1+\sqrt{22085632}\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\sqrt{22085632}\right)^{-k}}{k}\right)^2\right)^\wedge (1/4)\right) / \left(\sum_{k=0}^{\infty}\frac{(-0.00388698)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} =$$

$$\left(\left(\left(\tan^{-1}(x)+\pi\left\lfloor\frac{\arg\left(i\left(\frac{16}{9}-x\right)\right)}{2\pi}\right\rfloor+\frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-x)^{-k}+(i-x)^{-k}\right)\left(\frac{16}{9}-x\right)^k}{k}\right)^2+\right.\right.$$
$$\left.\left.\left(\log\left(-1+\sqrt{22085632}\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\sqrt{22085632}\right)^{-k}}{k}\right)^2\right)\wedge(1/4)\right)\Big/$$
$$\left(\sum_{k=0}^{\infty}\frac{(-0.00388698)^k\left(-\frac{1}{2}\right)_k}{k!}\right) \text{ for } (i\,x\in\mathbb{R} \text{ and } i\,x<-1)$$

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} =$$

$$\left(\left(\left(\log^2\left(-1+\sqrt{22085632}\right)+\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k 32^{1+2k} F_{1+2k}\left(\frac{1}{9+9\sqrt{\frac{1429}{405}}}\right)^{1+2k}}{1+2k}\right)^2-\right.\right.\right.$$
$$2\log\left(-1+\sqrt{22085632}\right)\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\sqrt{22085632}\right)^{-k}}{k}+$$
$$\left.\left.\left(\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\sqrt{22085632}\right)^{-k}}{k}\right)^2\right)\wedge(1/4)\right)\Big/$$
$$\left(\exp\left(i\pi\left\lfloor\frac{\arg(1.00389-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(1.00389-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
for $(x\in\mathbb{R}$ and $x<0)$

$n!$ is the factorial function

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

F_n is the n^{th} Fibonacci number

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

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

Continued fraction representations:

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} =$$

$$\frac{\sqrt[4]{\frac{256}{81\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{256k^2}{81}}{1+2k}\right)^2}+\frac{\left(-1+\sqrt{22085632}\right)^2}{\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\left\lfloor\frac{1+k}{2}\right\rfloor^2\left(-1+\sqrt{22085632}\right)}{1+k}\right)^2}}}{\sqrt{1.00389}} = 0.998062$$

$$\sqrt[4]{\frac{256}{81\left(1+\frac{256}{81\left(3+\frac{1024}{81\left(5+\frac{256}{9\left(7+\frac{4096}{81(9+\ldots)}\right)}\right)}\right)}\right)^2}+\frac{\left(-1+256\sqrt{337}\right)^2}{\left(1+\frac{-1+256\sqrt{337}}{2+\frac{-1+256\sqrt{337}}{3+\frac{4\left(-1+256\sqrt{337}\right)}{4+\frac{4\left(-1+256\sqrt{337}\right)}{5+\ldots}}}}\right)^2}}$$

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} =$$

$$\frac{\sqrt[4]{\dfrac{256}{81\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\dfrac{\frac{256k^2}{81}}{1+2k}\right)^2}+\dfrac{\left(-1+\sqrt{22085632}\right)^2}{\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\dfrac{\left\lfloor\frac{1+k}{2}\right\rfloor\left(-1+\sqrt{22085632}\right)}{\frac{1}{2}\left(3+(-1)^k(-1+k)+k\right)}\right)^2}}}{\sqrt{1.00389}} = 0.998062$$

$$\sqrt[4]{\frac{256}{81\left(1+\dfrac{256}{81\left(3+\dfrac{1024}{81\left(5+\dfrac{256}{9\left(7+\frac{4096}{81(9+\ldots)}\right)}\right)}\right)}\right)^2}+\frac{\left(-1+256\sqrt{337}\right)^2}{\left(1+\dfrac{-1+256\sqrt{337}}{2+\dfrac{-1+256\sqrt{337}}{3+\dfrac{2\left(-1+256\sqrt{337}\right)}{2+\dfrac{2\left(-1+256\sqrt{337}\right)}{5+\ldots}}}}\right)^2}}$$

$$\frac{\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{1+0.0623457^2}} =$$

$$\frac{\sqrt[4]{\frac{256}{81\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{256\,k^2}{81}}{1+2\,k}\right)^2}+\frac{\left(-1+\sqrt{22\,085\,632}\right)^2}{\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\left\lfloor\frac{1+k}{2}\right\rfloor^2\left(-1+\sqrt{22\,085\,632}\right)}{1+k}\right)^2}}}{1+4\left(\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.000242937}{\frac{1}{2}}\right)} =$$

$$\frac{\sqrt[4]{\frac{256}{81\left(1+\frac{256}{81\left(3+\frac{1024}{81\left(5+\frac{256}{9\left(7+\frac{4096}{81\,(9+\ldots)}\right)}\right)}\right)}\right)^2}+\frac{\left(-1+256\sqrt{337}\right)^2}{\left(1+\frac{-1+256\sqrt{337}}{2+\frac{-1+256\sqrt{337}}{3+\frac{4\left(-1+256\sqrt{337}\right)}{4+\frac{4\left(-1+256\sqrt{337}\right)}{5+\ldots}}}}\right)^2}}}{1+4\,\frac{0.000242937}{\frac{1}{2}+\frac{0.000242937}{\frac{1}{2}+\frac{0.000242937}{\frac{1}{2}+\frac{0.000242937}{\frac{1}{2}+\ldots}}}}}$$

$\underset{k=k_1}{\overset{k_2}{\mathrm{K}}}\, a_k / b_k$ is a continued fraction

And:

atan(4096/2304)*[(((((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))^1/4]/[((((((ln sqrt(2304^2+4096^2))+((sqrt((ln sqrt(2304^2+4096^2))^2+(atan(4096/2304))^2)))))^2)))+(atan(4096/2304))^2]^1/2

Input:

$$\tan^{-1}\left(\frac{4096}{2304}\right)\times\left(\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}\right)\Big/$$
$$\left(\sqrt{\left(\left(\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}\right)^2+\tan^{-1}\left(\frac{4096}{2304}\right)^2\right)}\right)$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256\sqrt{337})+\sqrt{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}$$

(result in radians)

Decimal approximation:

0.181641271070908116703099520422878314716906317546232500491...

(result in radians)

0.18164127107…

Alternate forms:

$$\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}$$

$$\left(\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{(16\log(2)+\log(337))^2+4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)\Big/$$
$$\left(\sqrt{\left(4\tan^{-1}\left(\frac{16}{9}\right)^2+(16\log(2)+\log(337))\left(16\log(2)+\log(337)+\sqrt{256\log^2(2)+\log^2(337)+32\log(2)\log(337)+4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)\right)}\right)$$

$$\left(i \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right) \sqrt[4]{\log^2\left(256 \sqrt{337}\right) - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2}\right) / \left(2 \sqrt{\left(\left(\log\left(256 \sqrt{337}\right) + \sqrt{\log^2\left(256 \sqrt{337}\right) - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2}\right)^2 - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2\right)}\right)$$

Alternative representations:

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right) \sqrt[4]{\log^2\left(\sqrt{2304^2 + 4096^2}\right) + \tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{\left(\log\left(\sqrt{2304^2 + 4096^2}\right) + \sqrt{\log^2\left(\sqrt{2304^2 + 4096^2}\right) + \tan^{-1}\left(\frac{4096}{2304}\right)^2}\right)^2 + \tan^{-1}\left(\frac{4096}{2304}\right)^2}} = \left(\tan^{-1}\left(1, \frac{4096}{2304}\right) \sqrt[4]{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2 + \log^2\left(\sqrt{2304^2 + 4096^2}\right)}\right) / \left(\sqrt{\left(\tan^{-1}\left(1, \frac{4096}{2304}\right)^2 + \left(\log\left(\sqrt{2304^2 + 4096^2}\right) + \sqrt{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2 + \log^2\left(\sqrt{2304^2 + 4096^2}\right)}\right)^2\right)}\right)$$

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right) \sqrt[4]{\log^2\left(\sqrt{2304^2 + 4096^2}\right) + \tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{\left(\log\left(\sqrt{2304^2 + 4096^2}\right) + \sqrt{\log^2\left(\sqrt{2304^2 + 4096^2}\right) + \tan^{-1}\left(\frac{4096}{2304}\right)^2}\right)^2 + \tan^{-1}\left(\frac{4096}{2304}\right)^2}} = \left(\tan^{-1}\left(\frac{4096}{2304}\right) \sqrt[4]{\tan^{-1}\left(\frac{4096}{2304}\right)^2 + \log_e^2\left(\sqrt{2304^2 + 4096^2}\right)}\right) / \left(\sqrt{\left(\tan^{-1}\left(\frac{4096}{2304}\right)^2 + \left(\log_e\left(\sqrt{2304^2 + 4096^2}\right) + \sqrt{\tan^{-1}\left(\frac{4096}{2304}\right)^2 + \log_e^2\left(\sqrt{2304^2 + 4096^2}\right)}\right)^2\right)}\right)$$

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right)\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{\left(\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}\right)^2+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}$$

$$= \left(\tan^{-1}\left(1, \frac{4096}{2304}\right)\sqrt[4]{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}\right) / \left(\sqrt{\left(\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\left(\log_e\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\tan^{-1}\left(1, \frac{4096}{2304}\right)^2+\log_e^2\left(\sqrt{2304^2+4096^2}\right)}\right)^2\right)}\right)$$

Series representation:

$$\frac{\tan^{-1}\left(\frac{4096}{2304}\right)\sqrt[4]{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}{\sqrt{\left(\log\left(\sqrt{2304^2+4096^2}\right)+\sqrt{\log^2\left(\sqrt{2304^2+4096^2}\right)+\tan^{-1}\left(\frac{4096}{2304}\right)^2}\right)^2+\tan^{-1}\left(\frac{4096}{2304}\right)^2}}$$

$$= \Bigg(\Bigg(\Bigg(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2 +$$

$$\left(\tan^{-1}(z_0)+\frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\Bigg)\text{^}(1/4)$$

$$\left(2\tan^{-1}(z_0)+i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)\Bigg)\Big/$$

$$\Bigg(\sqrt{2}\;\sqrt{\Bigg(4\tan^{-1}(z_0)^2+4\log^2\left(-1+256\sqrt{337}\right)-}$$

$$8\log\left(-1+256\sqrt{337}\right)\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+4\left(\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+$$

$$4\,i\tan^{-1}(z_0)\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}-$$

$$\left(\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2+2\log\left(-1+256\sqrt{337}\right)$$

$$\sqrt{\Bigg(4\tan^{-1}(z_0)^2+4\log^2\left(-1+256\sqrt{337}\right)-8\log\left(-1+256\sqrt{337}\right)}$$

$$\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+4\left(\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+$$

$$4\,i\tan^{-1}(z_0)\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}-$$

$$\left(\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\Bigg)-$$

$$2\left(\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)\sqrt{\Bigg(4\tan^{-1}(z_0)^2+4\log^2\left(-1+256\sqrt{337}\right)-}$$

$$8\log\left(-1+256\sqrt{337}\right)\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+$$

$$4\left(\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+$$

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

From the exact result

$$\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}$$

(result in radians)

we obtain:

1/((((((tan^(-1)(16/9) (log^2(256 sqrt(337)) + tan^(-1)(16/9)^2)^(1/4))/sqrt(tan^(-1)(16/9)^2 + (log(256 sqrt(337)) + sqrt(log^2(256 sqrt(337)) + tan^(-1)(16/9)^2))^2))))))^3 - 29+golden ratio

where 29 is a Lucas number

Input:

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-29+\phi$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact Result:

$$\phi-29+\frac{\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

(result in radians)

Decimal approximation:

139.4796337855778235756250292055734928253628941874126208740...

(result in radians)

139.4796337… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$-29+\frac{1}{2}\left(1+\sqrt{5}\right)+\frac{\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

$$\phi-29+\left(4\tan^{-1}\left(\frac{16}{9}\right)^2+(16\log(2)+\log(337))\left(16\log(2)+\log(337)+\sqrt{256\log^2(2)+\log^2(337)+32\log(2)\log(337)+4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)\right)^{3/2}\Big/\left(\tan^{-1}\left(\frac{16}{9}\right)^3\left((16\log(2)+\log(337))^2+4\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}\right)$$

$$\phi-29+\left(8i\left(\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)-\frac{1}{4}\left(\log\left(1-\frac{16i}{9}\right)-\log\left(1+\frac{16i}{9}\right)\right)^2}\right)^2-\frac{1}{4}\left(\log\left(1-\frac{16i}{9}\right)-\log\left(1+\frac{16i}{9}\right)\right)^2\right)^{3/2}\right)\Big/\left(\left(\log\left(1-\frac{16i}{9}\right)-\log\left(1+\frac{16i}{9}\right)\right)^3\left(\log^2\left(256\sqrt{337}\right)-\frac{1}{4}\left(\log\left(1-\frac{16i}{9}\right)-\log\left(1+\frac{16i}{9}\right)\right)^2\right)^{3/4}\right)$$

Alternative representations:

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-29+\phi=$$

$$-29+\phi+\frac{1}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-29+\phi=$$

$$-29+\phi+\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-29+\phi=$$

$$-29+\phi+\frac{1}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

Series representation:

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-29+\phi=$$

$$-29+\phi+\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/2}\Bigg/\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/4}\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^3\right)$$

for $(i z_0 \notin \mathbb{R}$ or $($not $(1 \le i z_0 < \infty)$ and not $(-\infty < i z_0 \le -1)))$

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

And:

1/((((((tan^(-1)(16/9) (log^2(256 sqrt(337)) + tan^(-1)(16/9)^2)^(1/4))/sqrt(tan^(-1)(16/9)^2 + (log(256 sqrt(337)) + sqrt(log^2(256 sqrt(337)) + tan^(-1)(16/9)^2))^2))))))^3 - 34-8+1/golden ratio

where 34 and 8 are Fibonacci numbers

Input:

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\frac{1}{\phi}$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact Result:

$$\frac{1}{\phi}-42+\frac{\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

(result in radians)

Decimal approximation:

125.4796337855778235756250292055734928253628941874126208740...

(result in radians)

125.4796337… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$-42+\frac{2}{1+\sqrt{5}}+\frac{\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

$$\frac{1}{\phi} - 42 + \left(4 \tan^{-1}\left(\frac{16}{9}\right)^2 + (16 \log(2) + \log(337)) \left(16 \log(2) + \log(337) + \sqrt{256 \log^2(2) + \log^2(337) + 32 \log(2) \log(337) + 4 \tan^{-1}\left(\frac{16}{9}\right)^2}\right)\right)^{3/2} \Big/ \left(\tan^{-1}\left(\frac{16}{9}\right)^3 \left((16 \log(2) + \log(337))^2 + 4 \tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}\right)$$

$$\frac{1}{\phi} - 42 + \left(8 i \left(\left(\log\left(256 \sqrt{337}\right) + \sqrt{\log^2\left(256 \sqrt{337}\right) - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2}\right)^2 - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2\right)^{3/2}\right) \Big/ \left(\left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^3 \left(\log^2\left(256 \sqrt{337}\right) - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2\right)^{3/4}\right)$$

Alternative representations:

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right) \sqrt[4]{\log^2\left(256 \sqrt{337}\right) + \tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2 + \left(\log\left(256 \sqrt{337}\right) + \sqrt{\log^2\left(256 \sqrt{337}\right) + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3} - 34 - 8 + \frac{1}{\phi} =$$

$$-42 + \frac{1}{\phi} + \frac{1}{\left(\frac{\tan^{-1}\left(1, \frac{16}{9}\right) \sqrt[4]{\tan^{-1}\left(1, \frac{16}{9}\right)^2 + \log^2\left(256 \sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1, \frac{16}{9}\right)^2 + \left(\log\left(256 \sqrt{337}\right) + \sqrt{\tan^{-1}\left(1, \frac{16}{9}\right)^2 + \log^2\left(256 \sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\frac{1}{\phi}=$$

$$-42+\frac{1}{\phi}+\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\frac{1}{\phi}=$$

$$-42+\frac{1}{\phi}+\frac{1}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

Series representation:

$$\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3} - 34 - 8 + \frac{1}{\phi} =$$

$$-42 + \frac{1}{\phi} + \left(\left(\left(\log\left(-1+256\sqrt{337}\right) - \sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k} + \sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right) - \sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2 + \left(\tan^{-1}(z_0) + \frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}\right)^2 + \left(\tan^{-1}(z_0) + \frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/2} \Big/ \left(\left(\left(\log\left(-1+256\sqrt{337}\right) - \sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2 + \left(\tan^{-1}(z_0) + \frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/4} \left(\tan^{-1}(z_0) + \frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^3\right)$$

for $(i z_0 \notin \mathbb{R}$ or (not $(1 \leq i z_0 < \infty)$ and not $(-\infty < i z_0 \leq -1)))$

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

13*[1/((((((tan^(-1)(16/9) (log^2(256 sqrt(337)) + tan^(-1)(16/9)^2)^(1/4))/sqrt(tan^(-1)(16/9)^2 + (log(256 sqrt(337)) + sqrt(log^2(256 sqrt(337)) + tan^(-1)(16/9)^2))^2))))))^3 - 34-8+Pi]+64

where 13 is a Fibonacci number

Input:

$$13\left(\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\pi\right)+64$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$64+13\left(-42+\pi+\frac{\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}\right)$$

(result in radians)

Decimal approximation:

1728.041501855430385556480114808335648693916807290765529828...

(result in radians)

1728.041501855…

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

Alternate forms:

$$64+13\left(-42+\pi+\frac{\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}\right)$$

$$-482+13\pi+\left(13\left(4\tan^{-1}\left(\frac{16}{9}\right)^2+(16\log(2)+\log(337))\left(16\log(2)+\log(337)+\sqrt{256\log^2(2)+\log^2(337)+32\log(2)\log(337)+4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)\right)^{3/2}\right)/\left(\tan^{-1}\left(\frac{16}{9}\right)^3\left((16\log(2)+\log(337))^2+4\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}\right)$$

$$-482+13\pi+\left(104\,i\left(\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)-\frac{1}{4}\left(\log\left(1-\frac{16\,i}{9}\right)-\log\left(1+\frac{16\,i}{9}\right)\right)^2}\right)^2-\frac{1}{4}\left(\log\left(1-\frac{16\,i}{9}\right)-\log\left(1+\frac{16\,i}{9}\right)\right)^2\right)^{3/2}\right)/\left(\left(\log\left(1-\frac{16\,i}{9}\right)-\log\left(1+\frac{16\,i}{9}\right)\right)^3\left(\log^2\left(256\sqrt{337}\right)-\frac{1}{4}\left(\log\left(1-\frac{16\,i}{9}\right)-\log\left(1+\frac{16\,i}{9}\right)\right)^2\right)^{3/4}\right)$$

Alternative representations:

$$13\left(\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\pi\right)+64=$$

$$64+13\left(-42+\pi+\frac{1}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}\right)$$

$$13\left(\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\pi\right)+64=$$

$$64+13\left(-42+\pi+\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}\right)$$

$$13\left(\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\pi\right)+64=$$

$$64+13\left(-42+\pi+\frac{1}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}\right)$$

Series representation:

$$13\left(\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}-34-8+\pi\right)+64=$$

$$64+13\left(-42+\pi+\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/2}\Big/\left(\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/4}\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^3\right)\right)\right)$$

for ($i z_0 \notin \mathbb{R}$ or (not ($1 \leq i z_0 < \infty$) and not ($-\infty < i z_0 \leq -1$)))

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

We have also that:

24*[1/((((((tan^(-1)(16/9) (log^2(256 sqrt(337)) + tan^(-1)(16/9)^2)^(1/4))/sqrt(tan^(-1)(16/9)^2 + (log(256 sqrt(337)) + sqrt(log^2(256 sqrt(337)) + tan^(-1)(16/9)^2))^2))))))^3]+29+golden ratio

where 29 is a Lucas number

Input:

$$24\times\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+29+\phi$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact Result:

$$\phi+29+\frac{24\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

(result in radians)

Decimal approximation:

4035.296429112620184306295203743354151101142349362370355148...

(result in radians)

4035.296429…

Alternate forms:

$$29+\frac{1}{2}\left(1+\sqrt{5}\right)+\frac{24\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

$$\phi + 29 + \left(24 \left(4 \tan^{-1}\left(\frac{16}{9}\right)^2 + (16 \log(2) + \log(337)) \left(16 \log(2) + \log(337) + \sqrt{256 \log^2(2) + \log^2(337) + 32 \log(2) \log(337) + 4 \tan^{-1}\left(\frac{16}{9}\right)^2}\right)\right)^{3/2}\right) / \left(\tan^{-1}\left(\frac{16}{9}\right)^3 \left((16 \log(2) + \log(337))^2 + 4 \tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}\right)$$

$$\phi + 29 + \left(192 i \left(\left(\log\left(256 \sqrt{337}\right) + \sqrt{\log^2\left(256 \sqrt{337}\right) - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2}\right)^2 - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2\right)^{3/2}\right) / \left(\left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^3 \left(\log^2\left(256 \sqrt{337}\right) - \frac{1}{4} \left(\log\left(1 - \frac{16 i}{9}\right) - \log\left(1 + \frac{16 i}{9}\right)\right)^2\right)^{3/4}\right)$$

Alternative representations:

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right) \sqrt[4]{\log^2\left(256 \sqrt{337}\right) + \tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2 + \left(\log\left(256 \sqrt{337}\right) + \sqrt{\log^2\left(256 \sqrt{337}\right) + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3} + 29 + \phi =$$

$$29 + \phi + \frac{24}{\left(\frac{\tan^{-1}\left(1, \frac{16}{9}\right) \sqrt[4]{\tan^{-1}\left(1, \frac{16}{9}\right)^2 + \log^2\left(256 \sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1, \frac{16}{9}\right)^2 + \left(\log\left(256 \sqrt{337}\right) + \sqrt{\tan^{-1}\left(1, \frac{16}{9}\right)^2 + \log^2\left(256 \sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+29+\phi = 29+\phi+\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+29+\phi = 29+\phi+\frac{24}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

Series representations:

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+29+\phi=$$

$$29+\phi+\left(24\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+\sqrt{\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/2}\right)\Big/$$

$$\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/4}\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^3\right)$$

for $(i z_0 \notin \mathbb{R}$ or (not $(1 \le i z_0 < \infty)$ and not $(-\infty < i z_0 \le -1)))$

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+29+\phi=$$

$$29+\phi+\left(24\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/2}\right)\Bigg/\left(\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/4}\left(\tan^{-1}(z_0)+\frac{1}{2}\,i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^3\right)\right)$$

for (not $((i\,z_0 \in \mathbb{R}$ and $-\infty < i\,z_0 \le -1))$
and
not
$((i\,z_0 \in \mathbb{R}$ and $1 \le i\,z_0 < \infty)))$

From:

The interaction of glueball and heavy-light flavoured meson in holographic QCD
Si-wen Li - arXiv:1809.10379v1 [hep-th] 27 Sep 2018

In order to match the experimental value of the ρ meson mass $m_\rho = \sqrt{\lambda_1} M_{KK} \simeq 776\text{MeV}$ where λ_1 is numerically evaluated as $\lambda_1 = 0.669314...$, we first need to fix the Kaluza-Klein mass to $M_{KK} = 949\text{MeV}$. Then let us identify the lowest mode of the heavy-light meson field $Q_{\mu,n=0}, Q_{n=0}$ as the vector meson D^0_μ and the pseudoscalar meson D^0 whose mass is given as $M\left(D^0_\mu\right) \simeq 2007\text{MeV}$, $M\left(D^0\right) \simeq 1865\text{MeV}$ by experiments. In this sense, we further consider the case of $N_f = 2$ for D-meson, so the parameters in (3.20) (3.21) can be numerically fixed as

$$M_S \simeq 1754\text{MeV},\ M_V \simeq 2007\text{MeV},\ M_{KK}R \simeq 1.048,\ v \simeq 35195.4\lambda^{-1}N_c^{-1}M_{KK}. \tag{5.4}$$

On the other hand, the glueball mass in holography is determined by solving the eigen equations (2.11) (2.16) for exotic, dilatonic and tensor glueball respectively. For the reader's convenience, we collect the mass spectrum of various glueballs in Table 2. It is clear that the glueball decay occurs when the mass relation $m_{\text{glueball}}/m_{\text{D-meson}} \simeq 2$ is satisfied because the effective holographic action we discussed is quadratic of the heavy-light meson fields. Accordingly we will choose the excited mass of $n = 3$ as $M_E = \sqrt{154.963/9}M_{KK} \simeq 3938\text{MeV}$, $M_D = M_T = \sqrt{162.699/9}M_{KK} \simeq 4035\text{MeV}$ for the exotic, dilatonic and tensor glueball respectively. With these values for the parameters, the boundary condition for the eigen equations (2.11) (2.16) is numerically evaluated as,

$$H_E\left(r_{KK}\right)^{-1} \simeq 0.00692402\lambda^{1/2}N_cM_{KK},\quad H_{D,T}\left(r_{KK}\right)^{-1} \simeq 0.0211777\lambda^{1/2}N_cM_{KK}. \tag{5.5}$$

$$M_D = M_T = \quad \sqrt{162.699/9}M_{KK} \simeq 4035\text{MeV}$$

value of the dilatonic glueball.

We note the following mathematical connection:

Exact Result:

$$\phi + 29 + \frac{24\left(\tan^{-1}\left(\frac{16}{9}\right)^2 + \left(\log\left(256\sqrt{337}\right) + \sqrt{\log^2\left(256\sqrt{337}\right) + \tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right) + \tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

(result in radians)

Decimal approximation:

4035.296429112620184306295203743354151101142349362370355148...

(result in radians)

4035.296429…

Furthermore, we have also:

1/e*[24/((((((tan^(-1)(16/9) (log^2(256 sqrt(337)) + tan^(-1)(16/9)^2)^(1/4))/sqrt(tan^(-1)(16/9)^2 + (log(256 sqrt(337)) + sqrt(log^2(256 sqrt(337)) + tan^(-1)(16/9)^2))^2))))))^3]+256

where 256 = 64 * 4

Input:

$$\frac{1}{e} \times \frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right) \sqrt[4]{\log^2\left(256 \sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256 \sqrt{337}\right)+\sqrt{\log^2\left(256 \sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+256$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Exact Result:

$$256+\frac{24\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256 \sqrt{337}\right)+\sqrt{\log^2\left(256 \sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{e \tan^{-1}\left(\frac{16}{9}\right)^3 \left(\log^2\left(256 \sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

(result in radians)

Decimal approximation:

1729.238850069517889145823150151776428910233634101026225911...

(result in radians)

1729.23885…

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

Alternate forms:

$$256+\frac{24\left(\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256)+\frac{\log(337)}{2}+\sqrt{\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2\right)^{3/2}}{e\tan^{-1}\left(\frac{16}{9}\right)^3\left(\left(\log(256)+\frac{\log(337)}{2}\right)^2+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}}$$

$$256+\left(24\left(4\tan^{-1}\left(\frac{16}{9}\right)^2+(16\log(2)+\log(337))\left(16\log(2)+\log(337)+\sqrt{256\log^2(2)+\log^2(337)+32\log(2)\log(337)+4\tan^{-1}\left(\frac{16}{9}\right)^2}\right)\right)^{3/2}\right)\Big/\left(e\tan^{-1}\left(\frac{16}{9}\right)^3\left((16\log(2)+\log(337))^2+4\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}\right)$$

$$\left(16\left(16\,e\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}+3\sqrt{2}\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2+\log\left(256\sqrt{337}\right)\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^{3/2}\right)\right)\Big/\left(e\tan^{-1}\left(\frac{16}{9}\right)^3\left(\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2\right)^{3/4}\right)$$

Alternative representations:

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3 e}+256=$$

$$256+\frac{24}{e\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3 e}+256=$$

$$256+\frac{24}{e\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3 e}+256=$$

$$256+\frac{24}{e\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

Series representation:

$$\frac{24}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3 e}+256=$$

$$256+\left(24\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}+\sqrt{\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/2}\right)\Bigg/$$

$$\left(e\left(\left(\log\left(-1+256\sqrt{337}\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{1}{1-256\sqrt{337}}\right)^k}{k}\right)^2+\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^2\right)^{3/4}\left(\tan^{-1}(z_0)+\frac{1}{2}i\sum_{k=1}^{\infty}\frac{\left(-(-i-z_0)^{-k}+(i-z_0)^{-k}\right)\left(\frac{16}{9}-z_0\right)^k}{k}\right)^3\right)$$

for ($i z_0 \notin \mathbb{R}$ or (not ($1 \le i z_0 < \infty$) and not ($-\infty < i z_0 \le -1$)))

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

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

for n = 213, we obtain:

sqrt(golden ratio) * exp(Pi*sqrt(213/15)) / (2*5^(1/4)*sqrt(213))

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{213}{15}}\right)}{2 \sqrt[4]{5} \sqrt{213}}$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{71/5}\,\pi} \sqrt{\frac{\phi}{213}}}{2 \sqrt[4]{5}}$$

Decimal approximation:

4035.483425247420442884076501190630859556030569888526687828...

4035.483425...

Property:

$$\frac{e^{\sqrt{71/5}\,\pi} \sqrt{\frac{\phi}{213}}}{2 \sqrt[4]{5}}$$ is a transcendental number

Alternate forms:

$$\frac{1}{2} \sqrt{\frac{5+\sqrt{5}}{2130}}\, e^{\sqrt{71/5}\,\pi}$$

$$\frac{\sqrt{\frac{1}{426}\left(1+\sqrt{5}\right)}\, e^{\sqrt{71/5}\,\pi}}{2 \sqrt[4]{5}}$$

Series representations:

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{213}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{213}} = \frac{\exp\left(\pi\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{71}{5}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}}{2\sqrt[4]{5}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(213-z_0)^k z_0^{-k}}{k!}}$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{213}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{213}} = \left(\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{71}{5}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{71}{5}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \Big/ \left(2\sqrt[4]{5}\,\exp\left(i\pi\left\lfloor\frac{\arg(213-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(213-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{213}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{213}} = \left(\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{71}{5}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{71}{5}-z_0\right)/(2\pi)\right\rfloor\right)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{71}{5}-z_0\right)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(213-z_0)/(2\pi)\rfloor+1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor} z_0^{-1/2\lfloor\arg(213-z_0)/(2\pi)\rfloor+1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right) \Big/ \left(2\sqrt[4]{5}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(213-z_0)^k z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

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

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

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

Now, from

$$\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256\sqrt{337})+\sqrt{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}$$

(result in radians)

0.18164127107090811670309952042287831471690631754623250049 1...

(result in radians)

= 0.18164127107.....

We obtain:

12*[1/((((((tan^(-1)(16/9) (log^2(256 sqrt(337)) + tan^(-1)(16/9)^2)^(1/4))/sqrt(tan^(-1)(16/9)^2 + (log(256 sqrt(337)) + sqrt(log^2(256 sqrt(337)) + tan^(-1)(16/9)^2))^2))))))^3]+34-288-21+1.618034

where 34 and 21 are Fibonacci numbers and 288 is equal to 144*2

Input interpretation:

$$12\times\frac{1}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log(256\sqrt{337})+\sqrt{\log^2(256\sqrt{337})+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+34-288-21+1.618034$$

$\tan^{-1}(x)$ is the inverse tangent function

$\log(x)$ is the natural logarithm

Result:

1728.957232...

(result in radians)

1728.957232…

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

Alternative representations:

$$\frac{12}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+34-288-21+1.61803=$$

$$-273.382+\frac{12}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{12}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+34-288-21+1.61803=$$

$$-273.382+\frac{12}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

$$\frac{12}{\left(\frac{\tan^{-1}\left(\frac{16}{9}\right)\sqrt[4]{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}}{\sqrt{\tan^{-1}\left(\frac{16}{9}\right)^2+\left(\log\left(256\sqrt{337}\right)+\sqrt{\log^2\left(256\sqrt{337}\right)+\tan^{-1}\left(\frac{16}{9}\right)^2}\right)^2}}\right)^3}+34-288-21+1.61803=$$

$$-273.382+\frac{12}{\left(\frac{\tan^{-1}\left(1,\frac{16}{9}\right)\sqrt[4]{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}}{\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\left(\log_e\left(256\sqrt{337}\right)+\sqrt{\tan^{-1}\left(1,\frac{16}{9}\right)^2+\log_e^2\left(256\sqrt{337}\right)}\right)^2}}\right)^3}$$

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