On several Ramanujan's equations: further mathematical connections with various parameters of Particle Physics, principally the Higgs boson mass, π meson mass 139.57 and Cosmology. X

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Abstract

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

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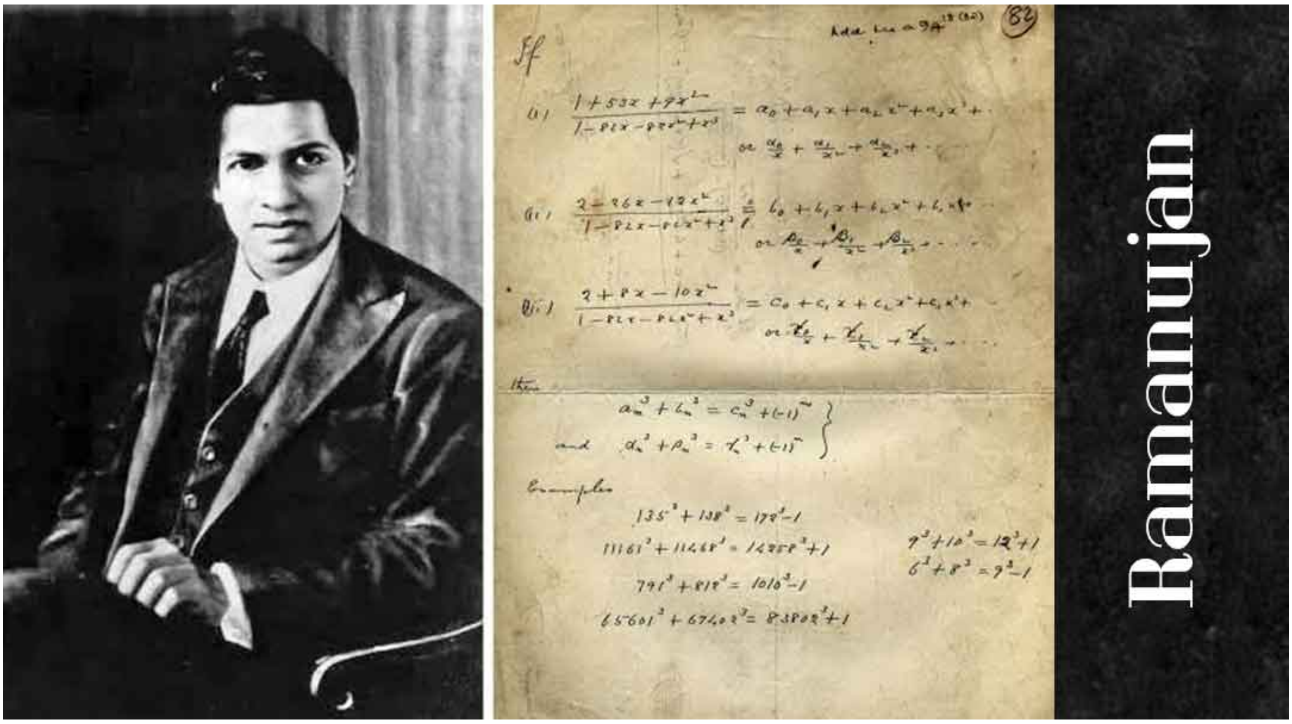

https://myindiafacts.online/30-ramanujan-random-facts-mathematical-genius/

Summary

In this research thesis, we have analyzed the possible and new connections between different formulas of Ramanujan's mathematics and some formulas concerning particle physics and cosmology. In the course of the discussion we describe and highlight the connections between some developments of

Ramanujan equations and particles type solutions such as the mass of the Higgs boson, and the masses of other baryons and mesons. Moreover solutions of Ramanujan equations, connected with the masses of the π mesons (139.57 and 134.9766 MeV) have been described and highlighted. Furthermore, we have obtained also the values of some black hole entropies and the value of the Cosmological Constant.

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

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

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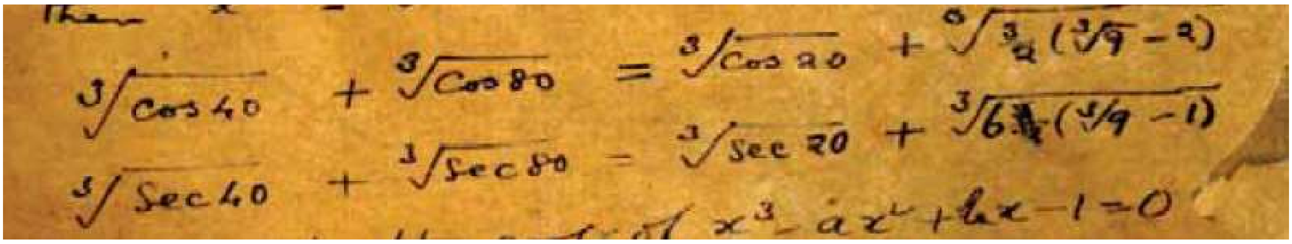

(sec 40)^1/3 + (sec 80)^1/3

Input:

$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)}$

$\sec(x)$ is the secant function

Decimal approximation:

1.61458980270085388116938541736391097294862123000919822080... +
2.79655157166048822158599144501463112640791047258859575026... i

Polar coordinates:

$r \approx 3.22918$ (radius), $\theta \approx 60°$ (angle)

3.22918

Alternate forms:

$$\frac{e^{(i\pi)/3}}{\sqrt[3]{-\cos(40)}} + \frac{e^{(i\pi)/3}}{\sqrt[3]{-\cos(80)}}$$

$$\frac{e^{(i\pi)/3}}{\sqrt[3]{\frac{1}{2}\left(-e^{-40i} - e^{40i}\right)}} + \frac{e^{(i\pi)/3}}{\sqrt[3]{\frac{1}{2}\left(-e^{-80i} - e^{80i}\right)}}$$

$$\frac{1}{2^{2/3}\sqrt[3]{-(1+\cos(80))\sec(40)}} + \frac{1}{2^{2/3}\sqrt[3]{-(1+\cos(160))\sec(80)}} + i\left(\frac{\sqrt{3}}{2^{2/3}\sqrt[3]{-(1+\cos(80))\sec(40)}} + \frac{\sqrt{3}}{2^{2/3}\sqrt[3]{-(1+\cos(160))\sec(80)}}\right)$$

Alternative representations:

$$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)} = \sqrt[3]{\frac{1}{\cos(40)}} + \sqrt[3]{\frac{1}{\cos(80)}}$$

$$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)} = \sqrt[3]{\frac{1}{\cosh(-40 i)}} + \sqrt[3]{\frac{1}{\cosh(-80 i)}}$$

$$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)} = \sqrt[3]{\frac{1}{\cosh(40 i)}} + \sqrt[3]{\frac{1}{\cosh(80 i)}}$$

Series representations:

$$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)} = \sqrt[3]{\sum_{k=-\infty}^{\infty} (-1)^k e^{40 i (1+2k)} (-1 + 2\theta(k))} + \sqrt[3]{\sum_{k=-\infty}^{\infty} (-1)^k e^{80 i (1+2k)} (-1 + 2\theta(k))}$$

$$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)} = \sqrt[3]{-\sum_{k=-\infty}^{\infty} (-1)^k e^{-40 i (1+2k)} (-1 + 2\theta(k))} + \sqrt[3]{-\sum_{k=-\infty}^{\infty} (-1)^k e^{-80 i (1+2k)} (-1 + 2\theta(k))}$$

$$\sqrt[3]{\sec(40)} + \sqrt[3]{\sec(80)} = 2^{2/3} \sqrt[3]{\pi} \left(\sqrt[3]{\sum_{k=0}^{\infty} \frac{(-1)^k (1+2k)}{-25600 + (\pi + 2k\pi)^2}} + \sqrt[3]{\sum_{k=0}^{\infty} \frac{(-1)^k (1+2k)}{-6400 + (\pi + 2k\pi)^2}} \right)$$

Or, in degree:

Input:

$$\sqrt[3]{\sec(40°)} + \sqrt[3]{\sec(80°)}$$

Exact result:

$$\sqrt[3]{\sec(40°)} + \sqrt[3]{\csc\left(\frac{\pi}{18}\right)}$$

csc(x) is the cosecant function

Decimal approximation:

2.885338333237742468085406734012766756045984955872395804746...

2.8853383332377…..

Alternate forms:

$$\sqrt[3]{\sec(40°)} + \frac{1}{\sqrt[3]{\sin\left(\frac{\pi}{18}\right)}}$$

$$\sqrt[3]{\csc\left(\frac{\pi}{18}\right)} + \sqrt[3]{\sec\left(\frac{2\pi}{9}\right)}$$

$$\frac{\sqrt[3]{\sin\left(\frac{\pi}{18}\right)\sec(40°)} + 1}{\sqrt[3]{\sin\left(\frac{\pi}{18}\right)}}$$

((((1/((((sec 40)^1/3 + (sec 80)^1/3)))))))^1/128

Input:

$$\sqrt[128]{\frac{1}{\sqrt[3]{\sec(40°)} + \sqrt[3]{\sec(80°)}}}$$

Exact result:

$$\frac{1}{\sqrt[128]{\sqrt[3]{\sec(40°)} + \sqrt[3]{\csc\left(\frac{\pi}{18}\right)}}}$$

csc(x) is the cosecant function

Decimal approximation:

0.991755717617335083291658209017538357942615676386351764406...

0.9917557176173….. result very near to the value of the following Rogers-Ramanujan continued fraction:

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

and to the dilaton value **$0.989117352243 = \phi$**

Alternate forms:

$$\frac{1}{\sqrt[128]{\sqrt[3]{\csc\left(\frac{\pi}{18}\right)} + \sqrt[3]{\sec\left(\frac{2\pi}{9}\right)}}}$$

$$\frac{\sqrt[384]{\sin\left(\frac{\pi}{18}\right)}}{\sqrt[128]{\sqrt[3]{\sin\left(\frac{\pi}{18}\right)\sec(40°)} + 1}}$$

$$\frac{1}{\sqrt[128]{\sqrt[3]{\sec(40°)} + \text{root of } x^9 - 6x^6 + 8 \text{ near } x = 1.79243}}$$

sec(x) is the secant function

log base 0.991755717617335 ((((1/((((sec 40)^1/3 + (sec 80)^1/3)))))))-Pi+1/golden ratio

Input interpretation:

$$\log_{0.991755717617335}\left(\frac{1}{\sqrt[3]{\sec(40°)} + \sqrt[3]{\sec(80°)}}\right) - \pi + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.4764413352...

125.4764413352…. 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

log base 0.991755717617335 ((((1/((((sec 40)^1/3 + (sec 80)^1/3)))))))+11+1/golden ratio

Input interpretation:

$$\log_{0.991755717617335}\left(\frac{1}{\sqrt[3]{\sec(40°)}+\sqrt[3]{\sec(80°)}}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.6180339887...

139.6180339887….. result practically equal to the rest mass of Pion meson 139.57

Now, we have:

(cos 40)^1/3 + (cos 80)^1/3

Input:

$$\sqrt[3]{\cos(40°)}+\sqrt[3]{\cos(80°)}$$

Exact result:

$$\sqrt[3]{\cos(40°)}+\sqrt[3]{\sin\left(\frac{\pi}{18}\right)}$$

Decimal approximation:

1.472893948380981103463237443021149281268157140490912151836...

1.47289394838…..

Alternate forms:

$$\sqrt[3]{\sin\left(\frac{\pi}{18}\right)}+\sqrt[3]{\cos\left(\frac{2\pi}{9}\right)}$$

$$\sqrt[3]{\cos(40°)}+\left(\text{root of } 8x^9-6x^3+1 \text{ near } x=0.5579\right)$$

$$\sqrt[3]{\cos(40°)}+\sqrt[3]{\frac{1}{2}\,i\left(e^{-(i\pi)/18}-e^{(i\pi)/18}\right)}$$

(((1/((((cos 40)^1/3 + (cos 80)^1/3))))))^1/64

Input:

$$\sqrt[64]{\frac{1}{\sqrt[3]{\cos(40°)}+\sqrt[3]{\cos(80°)}}}$$

Exact result:

$$\frac{1}{\sqrt[64]{\sqrt[3]{\cos(40°)} + \sqrt[3]{\sin\left(\frac{\pi}{18}\right)}}}$$

Decimal approximation:

0.9939678118653547011184615099368146428511205077844454730 81...

0.993967811865...... result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate forms:

$$\frac{1}{\sqrt[64]{\sqrt[3]{\sin\left(\frac{\pi}{18}\right)} + \sqrt[3]{\cos\left(\frac{2\pi}{9}\right)}}}$$

$$\frac{1}{\sqrt[64]{\sqrt[3]{\cos(40°)} + \left(\text{root of } 8x^9 - 6x^3 + 1 \text{ near } x = 0.5579\right)}}$$

$$\frac{1}{\sqrt[64]{\sqrt[3]{\cos(40°)} + \sqrt[3]{\frac{1}{2} i \left(e^{-(i\pi)/18} - e^{(i\pi)/18}\right)}}}$$

2log base 0.99396781186535 (((1/((((cos 40)^1/3 + (cos 80)^1/3))))))-Pi+1/golden ratio

Input interpretation:

$$2 \log_{0.99396781186535}\left(\frac{1}{\sqrt[3]{\cos(40°)} + \sqrt[3]{\cos(80°)}}\right) - \pi + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.476441335...

125.476441335…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18

2log base 0.99396781186535 (((1/((((cos 40)^1/3 + (cos 80)^1/3))))))+11+1/golden ratio

Input interpretation:

$$2 \log_{0.99396781186535}\left(\frac{1}{\sqrt[3]{\cos(40°)} + \sqrt[3]{\cos(80°)}}\right) + 11 + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618033989...

139.61803398.... result practically equal to the rest mass of Pion meson 139.57

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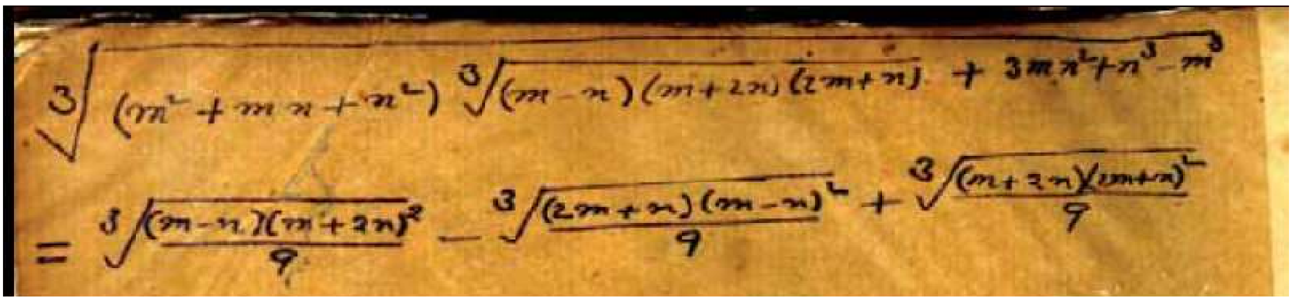


For m = 5, n = 3, we obtain:

((1/9*(5-3)(5+3*2)^2))^1/3 – ((1/9*(2*5+3)(5-3)^2))^1/3 + ((1/9*(5+2*3)(2*5+3)^2))^1/3

Input:

$$\sqrt[3]{\frac{1}{9}(5-3)(5+3\times 2)^2} - \sqrt[3]{\frac{1}{9}(2\times 5+3)(5-3)^2} + \sqrt[3]{\frac{1}{9}(5+2\times 3)(2\times 5+3)^2}$$

Result:

$$\frac{\sqrt[3]{2}\ 11^{2/3}}{3^{2/3}} - \left(\frac{2}{3}\right)^{2/3}\sqrt[3]{13} + \frac{\sqrt[3]{11}\ 13^{2/3}}{3^{2/3}}$$

Decimal approximation:

7.112719917559886252728237482895165037802526786770790308858...

7.1127199175….

Alternate forms:

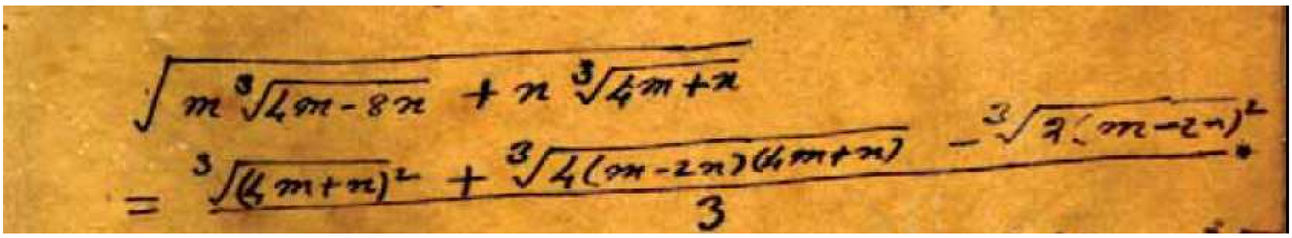
$$\frac{1}{3}\left(\sqrt[3]{6}\ 11^{2/3} - 2^{2/3}\sqrt[3]{39} + 13^{2/3}\sqrt[3]{33}\right)$$

$$\sqrt[3]{37+49\sqrt[3]{286}}$$

$$-\frac{-\sqrt[3]{2}\ 11^{2/3} + 2^{2/3}\sqrt[3]{13} - \sqrt[3]{11}\ 13^{2/3}}{3^{2/3}}$$

Minimal polynomial:

$$x^9 - 111x^6 + 4107x^3 - 33698267$$



$$\sqrt{m\sqrt[3]{4m-8n} + n\sqrt[3]{4m+n}} = \frac{\sqrt[3]{(4m+n)^2} + \sqrt[3]{4(m-2n)(4m+n)} - \sqrt[3]{2(m-2n)^2}}{3}.$$

For m = 5 and n = 3, we obtain

1/3 * ((((4*5+3)^2))^1/3 + ((4*(5-2*3)(4*5+3)))^1/3 - ((2*(5-2*3)^2))^1/3))))

Input:

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

Result:

$$\frac{1}{3}\left(-\sqrt[3]{2}+\sqrt[3]{-23}\ 2^{2/3}+23^{2/3}\right)$$

Decimal approximation:

3.02827902231073061720977558980680967230413925188010251009... +
1.30318274029455165944914790942056110508613534995044753900... i

Polar coordinates:

$r \approx 3.29678$ (radius), $\theta \approx 23.284°$ (angle)

3.29678

Alternate forms:

$$\frac{1}{3}\left(23^{2/3}+\sqrt[3]{-92}-\sqrt[3]{2}\right)$$

$$\frac{1}{3}\left(\text{root of } x^3+92 \text{ near } x = 2.25718+3.90955\,i \; - \sqrt[3]{2}+23^{2/3}\right)$$

$$-\frac{\sqrt[3]{2}}{3}+\frac{1}{3}\sqrt[3]{-23}\ 2^{2/3}+\frac{23^{2/3}}{3}$$

Minimal polynomial:

$$19\,683\,x^{18}-1\,299\,078\,x^{15}+131\,799\,555\,x^{12}-3\,549\,466\,008\,x^9+120\,930\,363\,369\,x^6-495\,579\,761\,622\,x^3+981\,218\,819\,953$$

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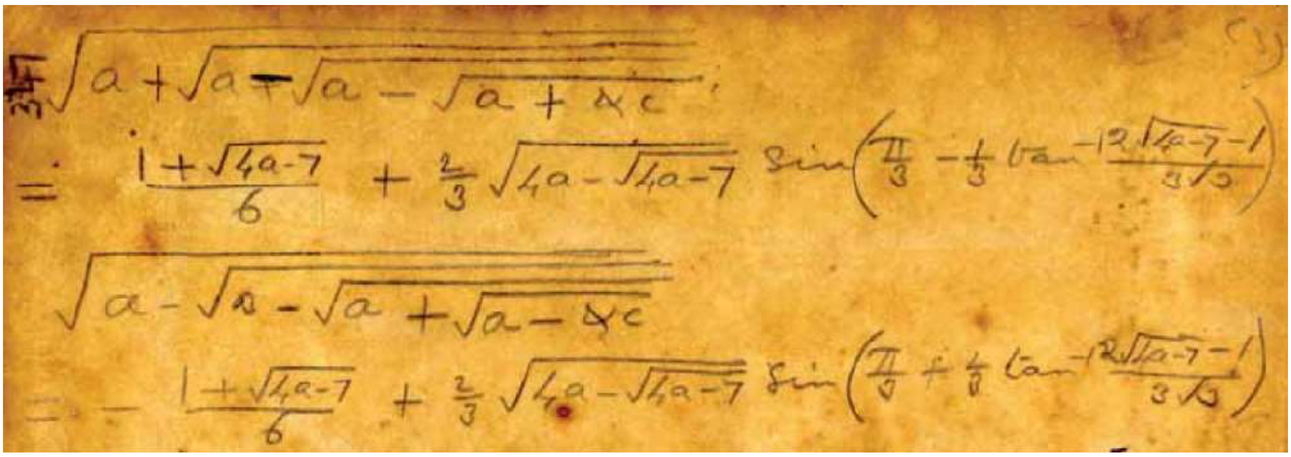

$$\sqrt{a+\sqrt{a+\sqrt{a-\sqrt{a+\&c}}}} = \frac{1+\sqrt{4a-7}}{6}+\frac{2}{3}\sqrt{4a-\sqrt{4a-7}}\,\sin\left(\frac{\pi}{3}-\frac{1}{3}\tan^{-1}\frac{2\sqrt{4a-7}-1}{3\sqrt{3}}\right)$$

$$\sqrt{a-\sqrt{a-\sqrt{a+\sqrt{a-\&c}}}} = -\frac{1+\sqrt{4a-7}}{6}+\frac{2}{3}\sqrt{4a-\sqrt{4a-7}}\,\sin\left(\frac{\pi}{3}+\frac{1}{3}\tan^{-1}\frac{2\sqrt{4a-7}-1}{3\sqrt{3}}\right)$$

For a = 4

-1/6(1+sqrt(4*4-7)) + 2/3*sqrt(((4*4-sqrt(4*4-7)))) * (((sin((((Pi/3+1/3 ((((tan^-1(2*sqrt(16-7)-1))/((((3sqrt3))))))))))

Input:

$$-\frac{1}{6}\left(1+\sqrt{4\times4-7}\right)+\frac{2}{3}\sqrt{4\times4-\sqrt{4\times4-7}}\ \sin\left(\frac{\pi}{3}+\frac{1}{3}\times\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\sqrt{3}}\right)$$

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

Exact Result:

$$\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}-\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)-\frac{2}{3}$$

(result in radians)

Decimal approximation:

1.512675874166590932948230949015017085101369986295658176498...

(result in radians)

1.51267587416659….

Alternate forms:

$$\frac{2}{3}\left(\sqrt{13}\cos\left(\frac{\pi}{6}-\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)-1\right)$$

$$\frac{2}{3}\left(\sqrt{13}\sin\left(\frac{1}{27}\left(9\pi+\sqrt{3}\tan^{-1}(5)\right)\right)-1\right)$$

$$-\frac{2}{3}+\frac{1}{3}\sqrt{13}\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)+\sqrt{\frac{13}{3}}\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)$$

Addition formula:

$$\frac{1}{6}\left(1+\sqrt{4\times4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times4-\sqrt{4\times4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$
$$\frac{1}{3}\left(-2+\sqrt{39}\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)+\sqrt{13}\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)\right)$$

Alternative representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$
$$-\frac{1}{6}\left(1+\sqrt{9}\right)+\frac{2}{3}\cos\left(\frac{\pi}{6}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\sqrt{16-\sqrt{9}}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$
$$-\frac{1}{6}\left(1+\sqrt{9}\right)-\frac{2}{3}\cos\left(\frac{5\pi}{6}+\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\sqrt{16-\sqrt{9}}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$
$$-\frac{1}{6}\left(1+\sqrt{9}\right)+\frac{2\left(-\exp\left(-i\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\right)+\exp\left(i\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\right)\right)\sqrt{16-\sqrt{9}}}{3(2i)}$$

Series representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$
$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{1}{54}\left(9\pi-2\sqrt{3}\tan^{-1}(5)\right)\right)^{2k}}{(2k)!}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$
$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{\pi}{6}-\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{2k}}{(2k)!}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2 =$$

$$-\frac{2}{3}-\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{\pi}{3}-\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{1+2k}}{(1+2k)!}$$

Integral representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2 =$$

$$-\frac{2}{3}-\frac{2\sqrt{13}}{3}\int_{\frac{\pi}{2}}^{\frac{1}{54}\left(9\pi-2\sqrt{3}\tan^{-1}(5)\right)}\sin(t)\,dt$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2 =$$

$$-\frac{2}{3}+\frac{2\sqrt{13}}{3}+\int_0^1 -\frac{1}{81}\sqrt{13}\left(9\pi-2\sqrt{3}\tan^{-1}(5)\right)\sin\left(\frac{1}{54}\,t\left(9\pi-2\sqrt{3}\tan^{-1}(5)\right)\right)dt$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2 =$$

$$-\frac{2}{3}-\frac{1}{3}\,i\sqrt{\frac{13}{\pi}}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{s-\left(9\pi-2\sqrt{3}\tan^{-1}(5)\right)^2/(11\,664\,s)}}{\sqrt{s}}\,ds \quad \text{for } \gamma>0$$

Continued fraction representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 =$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}-\frac{5}{9\sqrt{3}\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25k^2}{1+2k}\right)}\right)=$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}-\frac{5}{9\sqrt{3}\left(1+\frac{25}{3+\frac{100}{5+\frac{225}{7+\frac{400}{9+\dots}}}}\right)}\right)$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 =$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}-\frac{5-\frac{125}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}}{9\sqrt{3}}\right)=$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}-\frac{5-\frac{125}{3+\frac{225}{5+\frac{100}{7+\frac{625}{9+\frac{400}{11+\dots}}}}}}{9\sqrt{3}}\right)$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2=$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}-\frac{5}{9\sqrt{3}\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25\,(-1+2k)^2}{1+2k-25\,(-1+2k)}\right)}\right)=$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}-\frac{5}{9\sqrt{3}\left(1+\frac{25}{-22+\frac{225}{-70+\frac{625}{-118+\frac{1225}{-166+\dots}}}}\right)}\right)$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)(-1)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}+\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2=$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}-\frac{5}{9\sqrt{3}\left(26+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{50\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1+\frac{25}{2}\left(1+(-1)^k\right)\right)(1+2k)}\right)}\right)=$$

$$-\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}-\frac{5}{9\sqrt{3}\left(26+-\frac{50}{3-\frac{50}{130-\frac{300}{7-\frac{300}{234+\dots}}}}\right)}\right)$$

And:

1/6*(1+sqrt(4*4-7)) + 2/3*sqrt(((4*4-sqrt(4*4-7)))) * (((sin((((Pi/3-1/3 ((((tan^-1(2*sqrt(16-7)-1))/((((3sqrt3)))))))))))

Input:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{2}{3}\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{1}{3}\times\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\sqrt{3}}\right)$$

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

Exact Result:

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)$$

(result in radians)

Decimal approximation:

2.634508137340150021728933625300885718686913818693674457977...

(result in radians)

2.63450813734….

Alternate forms:

$$\frac{2}{3}\left(1+\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)\right)$$

$$\frac{2}{3}\left(1+\sqrt{13}\cos\left(\frac{1}{54}\left(9\pi+2\sqrt{3}\tan^{-1}(5)\right)\right)\right)$$

$$\frac{2}{3}-\frac{1}{3}\sqrt{13}\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)+\sqrt{\frac{13}{3}}\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)$$

Addition formula:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$

$$\frac{1}{3}\left(2+\sqrt{39}\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)-\sqrt{13}\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)\right)$$

Alternative representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 = \frac{1}{6}\left(1+\sqrt{9}\right)+\frac{2}{3}\cos\left(\frac{\pi}{6}+\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\sqrt{16-\sqrt{9}}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 = \frac{1}{6}\left(1+\sqrt{9}\right)-\frac{2}{3}\cos\left(\frac{5\pi}{6}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\sqrt{16-\sqrt{9}}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 = \frac{1}{6}\left(1+\sqrt{9}\right)+\frac{2\left(-\exp\left(-i\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\right)+\exp\left(i\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\right)\right)\sqrt{16-\sqrt{9}}}{3\left(2i\right)}$$

Series representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 = \frac{2}{3}+\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{1}{54}\left(9\pi+2\sqrt{3}\tan^{-1}(5)\right)\right)^{2k}}{(2k)!}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 = \frac{2}{3}+\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{2k}}{(2k)!}$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 =$$

$$\frac{2}{3}-\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{\pi}{3}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{1+2k}}{(1+2k)!}$$

Integral representations:

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 =$$

$$\frac{2}{3}-\frac{2\sqrt{13}}{3}\int_{\frac{\pi}{2}}^{\frac{1}{54}\left(9\pi+2\sqrt{3}\tan^{-1}(5)\right)}\sin(t)\,dt$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 =$$

$$\frac{2}{3}+\frac{2\sqrt{13}}{3}+\int_0^1-\frac{1}{81}\sqrt{13}\left(9\pi+2\sqrt{3}\tan^{-1}(5)\right)\sin\left(\frac{1}{54}t\left(9\pi+2\sqrt{3}\tan^{-1}(5)\right)\right)dt$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2 =$$

$$\frac{2}{3}-\frac{1}{3}i\sqrt{\frac{13}{\pi}}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{s-\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^2/(4s)}}{\sqrt{s}}\,ds\quad\text{for }\gamma>0$$

Continued fraction representations:

$$\frac{1}{6}\left(1+\sqrt{4\times4-7}\right)+\frac{1}{3}\left(\sqrt{4\times4-\sqrt{4\times4-7}}\,\sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\,\cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25k^2}{1+2k}\right)}\right)=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\,\cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\frac{25}{3+\frac{100}{5+\frac{225}{7+\frac{400}{9+\dots}}}}\right)}\right)$$

$$\frac{1}{6}\left(1+\sqrt{4\times4-7}\right)+\frac{1}{3}\left(\sqrt{4\times4-\sqrt{4\times4-7}}\,\sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\,\cos\left(\frac{\pi}{6}+\frac{5-\frac{125}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}}{9\sqrt{3}}\right)=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\,\cos\left(\frac{\pi}{6}+\frac{5-\frac{125}{3+\frac{225}{5+\frac{100}{7+\frac{625}{9+\frac{400}{11+\dots}}}}}}{9\sqrt{3}}\right)$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25(-1+2k)^2}{1+2k-25(-1+2k)}\right)}\right)=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\frac{25}{-22+\frac{225}{-70+\frac{625}{-118+\frac{1225}{-166+\ldots}}}}\right)}\right)$$

$$\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\,(3\sqrt{3})}\right)\right)2=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(26+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{50\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1+\frac{25}{2}\left(1+(-1)^k\right)\right)(1+2k)}\right)}\right)=$$

$$\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(26+-\frac{50}{3-\frac{50}{130-\frac{300}{7-\frac{300}{234+\ldots}}}}\right)}\right)$$

From which, we obtain:

((1/6*(1+sqrt(4*4-7)) + 2/3*sqrt(((4*4-sqrt(4*4-7)))) * (((sin((((Pi/3-1/3 ((((tan^-1(2*sqrt(16-7)-1))/((((3sqrt3)))))))))))))))^1/2

Input:

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{2}{3}\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{1}{3}\times\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\sqrt{3}}\right)}$$

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

Exact Result:

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)}$$

(result in radians)

Decimal approximation:

1.623116797196107517914644397188825082902834043887347364917...

(result in radians)

1.6231167971…

Alternate forms:

$$\sqrt{\frac{2}{3}\left(1+\sqrt{13}\cos\left(\frac{1}{54}\left(9\pi+2\sqrt{3}\tan^{-1}(5)\right)\right)\right)}$$

$$\sqrt{\left(\frac{2}{3}+\frac{1}{3}\sqrt{13}\left(\exp\left(\frac{i\pi}{6}-\frac{\log(1-5i)-\log(1+5i)}{18\sqrt{3}}\right)+\exp\left(\frac{\log(1-5i)-\log(1+5i)}{18\sqrt{3}}-\frac{i\pi}{6}\right)\right)\right)}$$

$$\sqrt{\left(\frac{1}{3}\left(2+\left((-1)^{2/3}\sqrt{13}-\sqrt[3]{-1}\sqrt{13}\right)\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)+\left(\sqrt[6]{-1}\sqrt{13}-(-1)^{5/6}\sqrt{13}\right)\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)\right)\right)}$$

$\log(x)$ is the natural logarithm

All 2nd roots of 2/3 + 2/3 sqrt(13) cos(π/6 + (tan^(-1)(5))/(9 sqrt(3))):

$$e^0 \sqrt{\frac{2}{3} + \frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6} + \frac{\tan^{-1}(5)}{9\sqrt{3}}\right)} \approx 1.6231 \text{ (real, principal root)}$$

$$e^{i\pi} \sqrt{\frac{2}{3} + \frac{2}{3}\sqrt{13}\cos\left(\frac{\pi}{6} + \frac{\tan^{-1}(5)}{9\sqrt{3}}\right)} \approx -1.6231 \text{ (real root)}$$

Addition formulas:

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} =$$
$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\left(\frac{1}{2}\sqrt{3}\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)-\frac{1}{2}\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)\right)}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} =$$
$$\frac{1}{\sqrt{\frac{3}{2+\sqrt{39}\cos\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)-\sqrt{13}\sin\left(\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)}}}$$

Alternative representations:

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} =$$
$$\sqrt{\frac{1}{6}\left(1+\sqrt{9}\right)+\frac{2}{3}\cos\left(\frac{\pi}{6}+\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\sqrt{16-\sqrt{9}}}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} =$$
$$\sqrt{\frac{1}{6}\left(1+\sqrt{9}\right)-\frac{2}{3}\cos\left(\frac{5\pi}{6}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\sqrt{16-\sqrt{9}}}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}(2\sqrt{16-7}-1)}{3(3\sqrt{3})}\right)\right)2} =$$

$$\sqrt{\left(\frac{1}{6}\left(1+\sqrt{9}\right)+\frac{2\left(-\exp\left(-i\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\right)+\exp\left(i\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(-1+2\sqrt{9}\right)}{3\left(3\sqrt{3}\right)}\right)\right)\right)\sqrt{16-\sqrt{9}}}{3(2i)}\right)}$$

Series representations:

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3(3\sqrt{3})}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{2k}}{(2k)!}}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3(3\sqrt{3})}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}-\frac{2}{3}\sqrt{13}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{\pi}{3}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{1+2k}}{(1+2k)!}}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3(3\sqrt{3})}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13\pi}\sum_{j=0}^{\infty}\operatorname{Res}_{s=-j}\frac{4^s\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^{-2s}\Gamma(s)}{\Gamma\left(\frac{1}{2}-s\right)}}$$

Integral representations:

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} = \sqrt{\frac{2}{3}-\frac{2\sqrt{13}}{3}\int_{\frac{\pi}{2}}^{\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}}\sin(t)\,dt}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} = \sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\left(1-\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\int_0^1\sin\left(t\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)\right)dt\right)}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} = \sqrt{\frac{2}{3}-\frac{1}{3}\,i\sqrt{\frac{13}{\pi}}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{s-\left(\frac{\pi}{6}+\frac{\tan^{-1}(5)}{9\sqrt{3}}\right)^2/(4s)}}{\sqrt{s}}\,ds} \quad \text{for } \gamma>0$$

Continued fraction representations:

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3(3\sqrt{3})}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25k^2}{1+2k}\right)}\right)} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\frac{25}{3+\frac{100}{5+\frac{225}{7+\frac{400}{9+\ldots}}}}\right)}\right)}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3(3\sqrt{3})}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5-\frac{125}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}}{9\sqrt{3}}\right)} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5-\frac{125}{3+\frac{225}{5+\frac{100}{7+\frac{625}{9+\frac{400}{11+\ldots}}}}}}{9\sqrt{3}}\right)}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{25(-1+2k)^2}{1+2k-25(-1+2k)}\right)}\right)} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(1+\cfrac{25}{-22+\cfrac{225}{-70+\cfrac{625}{-118+\cfrac{1225}{-166+\ldots}}}}\right)}\right)}$$

$$\sqrt{\frac{1}{6}\left(1+\sqrt{4\times 4-7}\right)+\frac{1}{3}\left(\sqrt{4\times 4-\sqrt{4\times 4-7}}\ \sin\left(\frac{\pi}{3}-\frac{\tan^{-1}\left(2\sqrt{16-7}-1\right)}{3\left(3\sqrt{3}\right)}\right)\right)2} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(26+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{50\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1+\frac{25}{2}\left(1+(-1)^k\right)\right)(1+2k)}\right)}\right)} =$$

$$\sqrt{\frac{2}{3}+\frac{2}{3}\sqrt{13}\ \cos\left(\frac{\pi}{6}+\frac{5}{9\sqrt{3}\left(26+-\cfrac{50}{3-\cfrac{50}{130-\cfrac{300}{7-\cfrac{300}{234+\ldots}}}}\right)}\right)}$$

From the sum of all four results, adding π and subtracting the value of the golden ratio, we obtain:

((((37 + 49 286^(1/3))^(1/3)))) + (((1/3 * ((((4*5+3)^2))^1/3 + ((4*(5-2*3)(4*5+3)))^1/3 - ((2*(5-2*3)^2))^1/3)))) + 2.63450813734 + 1.51267587416659 +Pi-golden ratio

Input interpretation:

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}+\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)+2.63450813734+1.51267587416659+\pi-\phi$$

ϕ is the golden ratio

Result:

15.81174161622... +
1.303182740295... i

Polar coordinates:

$r = 15.86535402040$ (radius), $\theta = 4.711592932784°$ (angle)

15.86535402040 result very near to the value of black hole entropy 15.8174

Alternative representations:

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}+\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=4.147184011506590+\pi+2\cos(216°)+\frac{1}{3}\left(\sqrt[3]{-92}-\sqrt[3]{2}+\sqrt[3]{23^2}\right)+\sqrt[3]{37+49\sqrt[3]{286}}$$

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}+\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=4.147184011506590+\pi-2\cos\left(\frac{\pi}{5}\right)+\frac{1}{3}\left(\sqrt[3]{-92}-\sqrt[3]{2}+\sqrt[3]{23^2}\right)+\sqrt[3]{37+49\sqrt[3]{286}}$$

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}+\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=4.147184011506590+180°+2\cos(216°)+\frac{1}{3}\left(\sqrt[3]{-92}-\sqrt[3]{2}+\sqrt[3]{23^2}\right)+\sqrt[3]{37+49\sqrt[3]{286}}$$

Series representations:

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times 5+3)^2}+\sqrt[3]{4(5-2\times 3)(4\times 5+3)}-\sqrt[3]{2(5-2\times 3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=(14.288182951377207+1.3031827402945516594491479094206\,i)-\phi+4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times 5+3)^2}+\sqrt[3]{4(5-2\times 3)(4\times 5+3)}-\sqrt[3]{2(5-2\times 3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=(12.288182951377207+1.3031827402945516594491479094206\,i)-\phi+2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times 5+3)^2}+\sqrt[3]{4(5-2\times 3)(4\times 5+3)}-\sqrt[3]{2(5-2\times 3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=(14.288182951377207+1.3031827402945516594491479094206\,i)-\phi+\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times 5+3)^2}+\sqrt[3]{4(5-2\times 3)(4\times 5+3)}-\sqrt[3]{2(5-2\times 3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=(14.288182951377207+1.3031827402945516594491479094206\,i)-\phi+2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times 5+3)^2}+\sqrt[3]{4(5-2\times 3)(4\times 5+3)}-\sqrt[3]{2(5-2\times 3)^2}\right)+2.634508137340000+1.512675874166590000+\pi-\phi=(14.288182951377207+1.3031827402945516594491479094206\,i)-\phi+4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$\sqrt[3]{37+49\sqrt[3]{286}}+\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}+\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)+$$
$$2.634508137340000+1.512675874166590000+\pi-\phi=$$
$$(14.288182951377207+1.30318274029455165944914790942061\,i)-\phi+2\int_0^\infty\frac{\sin(t)}{t}\,dt$$

Multiplying the results, we obtain:

18((((((((((37 + 49 286^(1/3))^(1/3)))) * (((1/3 * ((((4*5+3)^2))^1/3 * ((4*(5-2*3)(4*5+3)))^1/3 - ((2*(5-2*3)^2))^1/3)))) * 2.63450813734 * 1.51267587416659))))))-76

Where 18 and 76 are Lucas numbers

Input interpretation:

$$18\left(\sqrt[3]{37+49\sqrt[3]{286}}\left(\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)\right)\times 2.63450813734\times1.51267587416659\right)-76$$

Result:

2814.40322788... +
5377.46403019... i

Polar coordinates:

$r = 6069.43036249$ (radius), $\theta = 62.3737901501°$ (angle)

6069.43036249 result very near to the rest mass of bottom Omega baryon 6071

And:

golden ratio^3+3((((((((((37 + 49 286^(1/3))^(1/3)))) * (((1/3 * ((((4*5+3)^2))^1/3 * ((4*(5-2*3)(4*5+3)))^1/3 - ((2*(5-2*3)^2))^1/3)))) * 2.63450813734 * 1.51267587416659))))))

Input interpretation:

$$\phi^3 + 3\left(\sqrt[3]{37 + 49\sqrt[3]{286}}\left(\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)} - \sqrt[3]{2(5-2\times3)^2}\right)\right)\times 2.63450813734\times1.51267587416659\right)$$

ϕ is the golden ratio

Result:

485.969939290... +
896.244005032... i

Polar coordinates:

$r = 1019.519542946$ (radius), $\theta = 61.5321445626°$ (angle)

1019.519542946 result practically equal to the rest mass of Phi meson 1019.445

Alternative representations:

$$\phi^3 + \frac{3}{3}\sqrt[3]{37 + 49\sqrt[3]{286}}\left(\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)} - \sqrt[3]{2(5-2\times3)^2}\right) 2.634508137340000\times1.512675874166590000\right) = 3.985156899649779\left(-\sqrt[3]{2} + \sqrt[3]{-92}\sqrt[3]{23^2}\right)\sqrt[3]{37 + 49\sqrt[3]{286}} + (2\sin(54°))^3$$

$$\phi^3 + \frac{3}{3}\sqrt[3]{37 + 49\sqrt[3]{286}}\left(\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)} - \sqrt[3]{2(5-2\times3)^2}\right) 2.634508137340000\times1.512675874166590000\right) = (-2\cos(216°))^3 + 3.985156899649779\left(-\sqrt[3]{2} + \sqrt[3]{-92}\sqrt[3]{23^2}\right)\sqrt[3]{37 + 49\sqrt[3]{286}}$$

$$\phi^3 + \frac{3}{3}\sqrt[3]{37 + 49\sqrt[3]{286}}\left(\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)} - \sqrt[3]{2(5-2\times3)^2}\right) 2.634508137340000\times1.512675874166590000\right) = 3.985156899649779\left(-\sqrt[3]{2} + \sqrt[3]{-92}\sqrt[3]{23^2}\right)\sqrt[3]{37 + 49\sqrt[3]{286}} + (-2\sin(666°))^3$$

golden ratio+21+1/3((((((((((37 + 49 286^(1/3))^(1/3)))) * (((1/3 * ((((4*5+3)^2))^1/3 * ((4*(5-2*3)(4*5+3)))^1/3 - ((2*(5-2*3)^2))^1/3)))) * 2.63450813734 * 1.512675874166))))))

Input interpretation:

$$\phi + 21 + \frac{1}{3}\left(\sqrt[3]{37+49\sqrt[3]{286}}\left(\frac{1}{3}\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)\right)\times 2.63450813734\times1.512675874166\right)$$

ϕ is the golden ratio

Result:

76.1440196901... +
99.5826672258... i

Polar coordinates:

r = 125.357964830 (radius), θ = 52.5973415807° (angle)

125.357964830 result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18

Alternative representations:

$$\phi + 21 + \frac{1}{3\times3}\sqrt[3]{37+49\sqrt[3]{286}}\left(\sqrt[3]{(4\times5+3)^2}\sqrt[3]{4(5-2\times3)(4\times5+3)}-\sqrt[3]{2(5-2\times3)^2}\right)2.634508137340000\times1.5126758741660000 =$$

$$21+0.4427952110720250\left(-\sqrt[3]{2}+\sqrt[3]{-92}\sqrt[3]{23^2}\right)\sqrt[3]{37+49\sqrt[3]{286}}+2\sin(54°)$$

$$\phi + 21 + \frac{1}{3 \times 3} \sqrt[3]{37 + 49 \sqrt[3]{286}} \left(\sqrt[3]{(4 \times 5 + 3)^2} \sqrt[3]{4 (5 - 2 \times 3)(4 \times 5 + 3)} - \sqrt[3]{2 (5 - 2 \times 3)^2} \right)$$

$$2.634508137340000 \times 1.5126758741660000 =$$

$$21 - 2 \cos(216°) + 0.4427952110720250 \left(-\sqrt[3]{2} + \sqrt[3]{-92} \sqrt[3]{23^2} \right) \sqrt[3]{37 + 49 \sqrt[3]{286}}$$

$$\phi + 21 + \frac{1}{3 \times 3} \sqrt[3]{37 + 49 \sqrt[3]{286}} \left(\sqrt[3]{(4 \times 5 + 3)^2} \sqrt[3]{4 (5 - 2 \times 3)(4 \times 5 + 3)} - \sqrt[3]{2 (5 - 2 \times 3)^2} \right)$$

$$2.634508137340000 \times 1.5126758741660000 =$$

$$21 + 0.4427952110720250 \left(-\sqrt[3]{2} + \sqrt[3]{-92} \sqrt[3]{23^2} \right) \sqrt[3]{37 + 49 \sqrt[3]{286}} - 2 \sin(666°)$$

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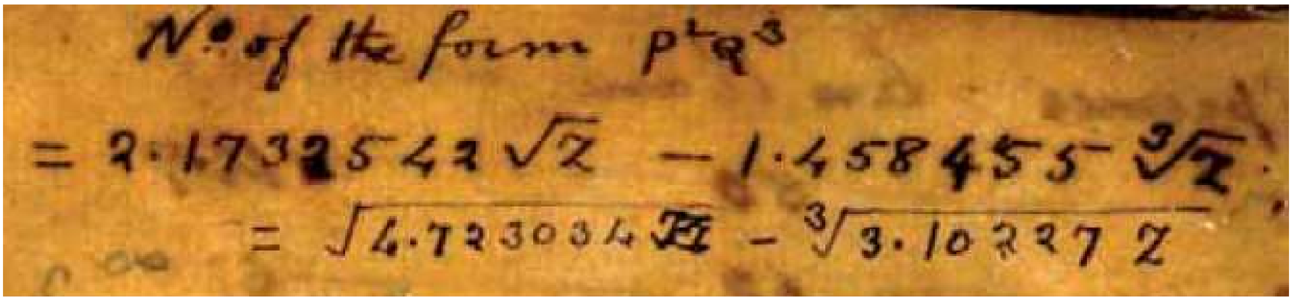

No. of the form $p^2 q^3$

$= 2.1732542 \sqrt{x} - 1.458455 \sqrt[3]{x}$

$= \sqrt{4.723034\, x} - \sqrt[3]{3.10227\, x}$

We have that:

2.1732542sqrt(x)-1.458455(x)^1/3 = 0

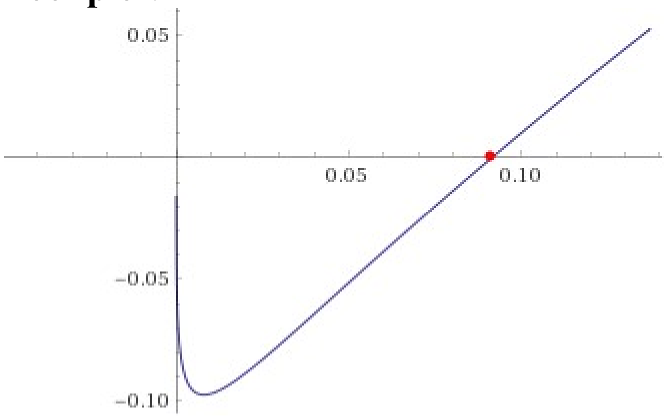
Input interpretation:

$$2.1732542 \sqrt{x} + \sqrt[3]{x} \times (-1.458455) = 0$$

Result:

$2.17325\sqrt{x} - 1.45846\sqrt[3]{x} = 0$

Root plot:



Alternate form assuming x is real:

$\sqrt[3]{x} = 0.671093\sqrt[6]{x}$

Alternate form:

$2.17325\left(\sqrt[6]{x} - 0.671093\right)\sqrt[3]{x} = 0$

Alternate form assuming x is positive:

$\sqrt[6]{x} = 0.671093$

Solutions:

$x = 0$

$x \approx 0.0913472$

0.0913472

2.1732542sqrt(0.0913472)-1.458455(0.0913472)^1/3

Input interpretation:

$2.1732542\sqrt{0.0913472} + \sqrt[3]{0.0913472} \times (-1.458455)$

Result:

$5.12357... \times 10^{-8}$

$5.12357...*10^{-8}$

-ln(((2.1732542sqrt(0.0913472)-1.458455(0.0913472)^1/3)))

Input interpretation:

$$-\log\left(2.1732542\sqrt{0.0913472}+\sqrt[3]{0.0913472}\times(-1.458455)\right)$$

log(x) is the natural logarithm

Result:

16.78682987177971830435592042565656911895607776705183019409...

16.786829871…. black hole entropy 16.8741

Alternative representations:

$$-\log\left(2.17325\sqrt{0.0913472}-1.45846\sqrt[3]{0.0913472}\right)=-\log_e\left(-1.45846\sqrt[3]{0.0913472}+2.17325\sqrt{0.0913472}\right)$$

$$-\log\left(2.17325\sqrt{0.0913472}-1.45846\sqrt[3]{0.0913472}\right)=-\log(a)\log_a\left(-1.45846\sqrt[3]{0.0913472}+2.17325\sqrt{0.0913472}\right)$$

$$-\log\left(2.17325\sqrt{0.0913472}-1.45846\sqrt[3]{0.0913472}\right)=\mathrm{Li}_1\left(1+1.45846\sqrt[3]{0.0913472}-2.17325\sqrt{0.0913472}\right)$$

Series representations:

$$-\log\left(2.17325\sqrt{0.0913472}-1.45846\sqrt[3]{0.0913472}\right)=\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1.65684+2.17325\sqrt{0.0913472}\right)^k}{k}$$

$$-\log\left(2.17325\sqrt{0.0913472}-1.45846\sqrt[3]{0.0913472}\right)=-\log\left(-0.656838+2.17325\sum_{k=0}^{\infty}\frac{(-1)^k(-0.908653)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$-\log\left(2.17325\sqrt{0.0913472} - 1.45846\sqrt[3]{0.0913472}\right) = -2 i \pi \left\lfloor \frac{\arg(-0.656838 - x + 2.17325\sqrt{0.0913472})}{2\pi} \right\rfloor - \log(x) + \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-0.656838 - x + 2.17325\sqrt{0.0913472})^k}{k} \quad \text{for } x < 0$$

Integral representation:

$$-\log\left(2.17325\sqrt{0.0913472} - 1.45846\sqrt[3]{0.0913472}\right) = -\int_1^{-0.656838+2.17325\sqrt{0.0913472}} \frac{1}{t}\, dt$$

And:

sqrt(4.723034x)-(3.10227x)^1/3

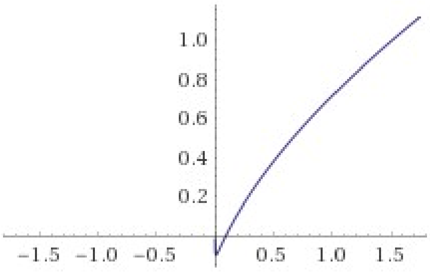
Input interpretation:

$$\sqrt{4.723034\, x} - \sqrt[3]{3.10227\, x}$$

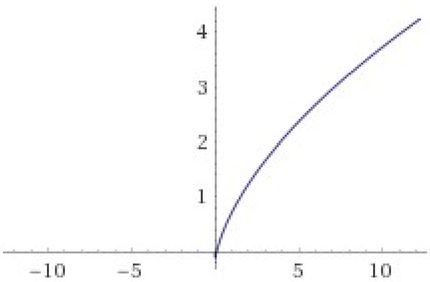
Result:

$$2.17325\sqrt{x} - 1.45846\sqrt[3]{x}$$

Plots:



(x from −1.7 to 1.7)



(x from −12.2 to 12.2)

Alternate forms:

$$2.17325\left(\sqrt[6]{x} - 0.671093\right)\sqrt[3]{x}$$

$\left(2.17325 \sqrt[6]{x} - 1.45846\right) \sqrt[3]{x}$

Roots:

$x = 0$

$x \approx 0.0913474$

0.0913474

Properties as a real function:

Domain

$\{x \in \mathbb{R} : x \geq 0\}$ (all non-negative real numbers)

Range

$\{y \in \mathbb{R} : y \geq -\frac{757\,390\,136\,718\,748\,872\,655\,694\,986\,769\,512\,672\,141\,339}{7\,783\,320\,190\,429\,684\,751\,806\,492\,178\,507\,995\,605\,468\,750}\}$

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

Derivative:

$$\frac{d}{dx}\left(2.17325 \sqrt{x} - 1.45846 \sqrt[3]{x}\right) = \frac{1.08663 \sqrt[6]{x} - 0.486152}{x^{2/3}}$$

Indefinite integral:

$$\int \left(\sqrt{4.723034\, x} - \sqrt[3]{3.10227\, x}\right) dx = 1.44884\, x^{3/2} - 1.09384\, x^{4/3} + \text{constant}$$

Global minimum:

$$\min\left\{2.17325 \sqrt{x} - 1.45846 \sqrt[3]{x}\right\} = -\frac{5\,392\,513\,736\,451\,350\,882\,867\,243\,590\,521\,543\,475\,136}{55\,416\,170\,619\,709\,352\,803\,091\,451\,130\,045\,931\,734\,407} \text{ at } x =$$

35 252 049 753 829 906 464 031 686 046 932 223 997 891 571 485 322 631 822 ⋱
304 915 121 756 586 555 466 817 963 770 574 536 704/
4 395 780 098 563 828 079 707 005 004 984 907 610 901 034 384 330 994 242 ⋱
005 462 554 224 028 486 649 598 812 920 311 745 182 889

(-0.486152 + 1.08663 x^(1/6))/x^(2/3)

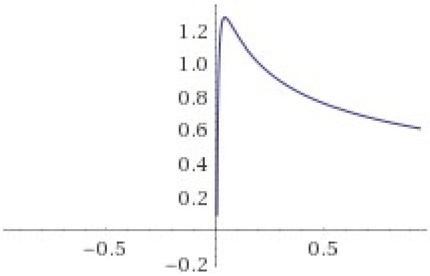
Input interpretation:

$$\frac{-0.486152 + 1.08663 \sqrt[6]{x}}{x^{2/3}}$$

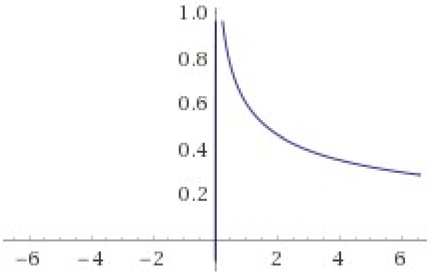
Result:

$$\frac{1.08663 \sqrt[6]{x} - 0.486152}{x^{2/3}}$$

Plots:



(x from −0.9 to 0.9)



(x from −6.6 to 6.6)

Alternate form:

$$\frac{1.08663 \left(\sqrt[6]{x} - 0.447394\right)}{x^{2/3}}$$

Expanded form:

$$\frac{1.08663}{\sqrt{x}} - \frac{0.486152}{x^{2/3}}$$

Root:

$x \approx 0.0080194$

0.0080194

Properties as a real function:

Domain

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

Range

$$\{y \in \mathbb{R} : y \le \frac{3764354610070213463547}{2941414273667681484800}\}$$

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

Derivative:

$$\frac{d}{dx}\left(\frac{1.08663\sqrt[6]{x} - 0.486152}{x^{2/3}}\right) = \frac{0.324101 - 0.543315\sqrt[6]{x}}{x^{5/3}}$$

Indefinite integral:

$$\int \frac{-0.486152 + 1.08663\sqrt[6]{x}}{x^{2/3}}\,dx = 2.17326\sqrt{x} - 1.45846\sqrt[3]{x} + \text{constant}$$

Global maximum:

$$\max\left\{\frac{1.08663\sqrt[6]{x} - 0.486152}{x^{2/3}}\right\} = \frac{3764354610070213463547}{2941414273667681484800}$$
$$\text{at } x = \frac{844913860286716233189736686127415296}{18751572798939632357787011343993140625}$$

Limit:

$$\lim_{x \to \pm\infty} \frac{-0.486152 + 1.08663\sqrt[6]{x}}{x^{2/3}} = 0 \approx 0$$

For x = 1, we obtain:

(-0.486152 + 1.08663 1^(1/6))/1^(2/3)

Input interpretation:

$$\frac{-0.486152 + 1.08663\sqrt[6]{1}}{1^{2/3}}$$

Result:

0.600478

0.600478

(-0.486152 + x 1^(1/6))/1^(2/3) = 0.600478

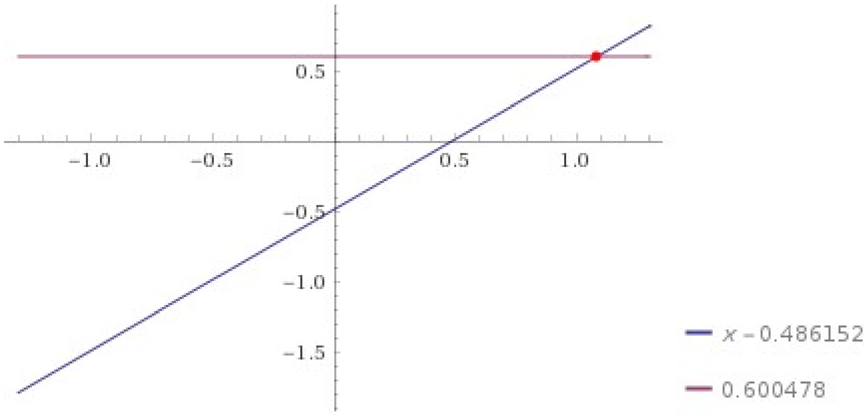
Input interpretation:

$$\frac{-0.486152 + x\sqrt[6]{1}}{1^{2/3}} = 0.600478$$

Result:

$x - 0.486152 = 0.600478$

Plot:



Alternate forms:

$x - 1.08663 = 0$

$x - 0.486152 = 0.600478$

Solution:

$x \approx 1.08663$

1.08663

From:

$$\frac{1.08663 \sqrt[6]{x} - 0.486152}{x^{2/3}}$$

that is:

(-0.486153 + 1.08663 0.0913474^(1/6))/0.0913474^(2/3)

Input interpretation:

$$\frac{-0.486153 + 1.08663 \sqrt[6]{0.0913474}}{0.0913474^{2/3}}$$

Result:

1.19843...

1.19843...

(-0.486153 + x 0.0913474^(1/6))/0.0913474^(2/3) = 1.19843

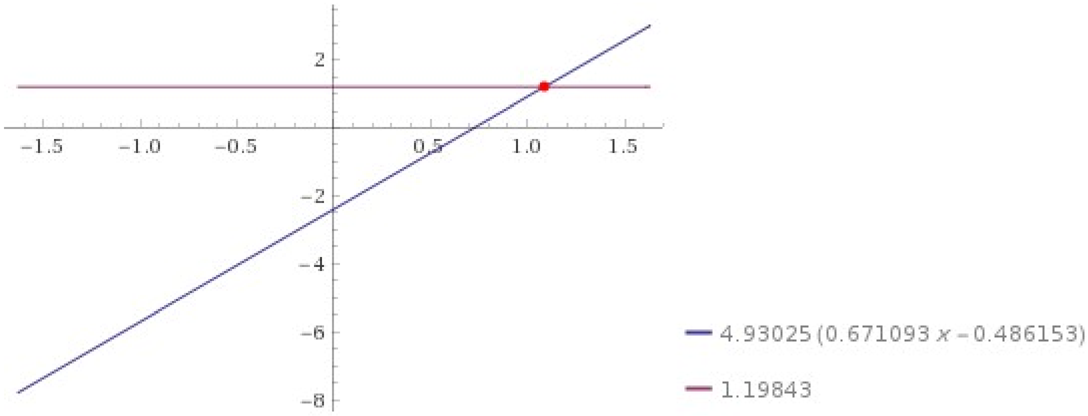
Input interpretation:

$$\frac{-0.486153 + x \sqrt[6]{0.0913474}}{0.0913474^{2/3}} = 1.19843$$

Result:

$$4.93025 (0.671093 x - 0.486153) = 1.19843$$

Plot:



Alternate forms:

$$3.30866 (x - 0.72442) = 1.19843$$

$$3.30866 x - 3.59529 = 0$$

$$3.30866 x - 2.39686 = 1.19843$$

Solution:

$x \approx 1.08663$

1.08663

2) We have also that:

2.1732542sqrt(x)-1.458455(x)^1/3 = sqrt(4.723034x)-(3.10227x)^1/3

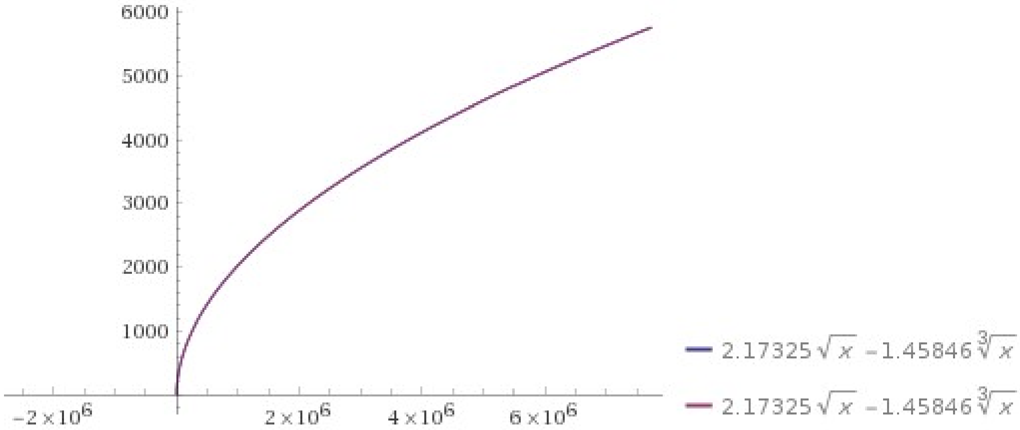
Input interpretation:

$$2.1732542 \sqrt{x} + \sqrt[3]{x} \times (-1.458455) = \sqrt{4.723034 x} - \sqrt[3]{3.10227 x}$$

Result:

$$2.17325 \sqrt{x} - 1.45846 \sqrt[3]{x} = 2.17325 \sqrt{x} - 1.45846 \sqrt[3]{x}$$

Plot:



Alternate form assuming x is real:

$$\sqrt[3]{x} = 13.1399 \sqrt[6]{x}$$

Alternate form:

$$2.17325 \left(\sqrt[6]{x} - 0.671093\right) \sqrt[3]{x} = 2.17325 \left(\sqrt[6]{x} - 0.671093\right) \sqrt[3]{x}$$

Alternate form assuming x is positive:

$$\sqrt[6]{x} = 13.1399$$

Solutions:

$x = 0$

$x \approx 5.14701 \times 10^6$

$5.14701*10^6$

2.17325 (-0.671093 + x^(1/6)) x^(1/3)

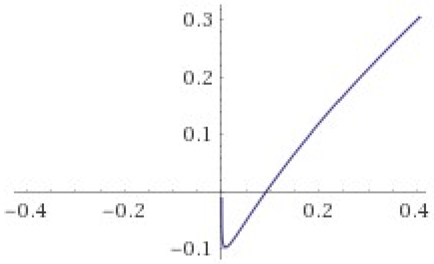
Input interpretation:

$$2.17325 \left(-0.671093 + \sqrt[6]{x}\right) \sqrt[3]{x}$$

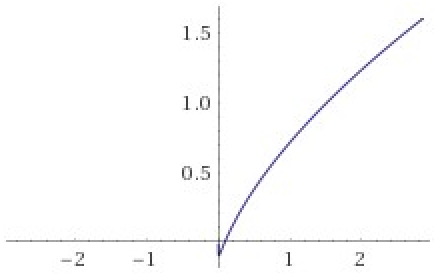
Result:

$$2.17325 \left(\sqrt[6]{x} - 0.671093\right) \sqrt[3]{x}$$

Plots:



(x from −0.4 to 0.4)



(x from −2.8 to 2.8)

Alternate form:

$$\left(2.17325\sqrt[6]{x} - 1.45845\right)\sqrt[3]{x}$$

Expanded form:

$$2.17325\sqrt{x} - 1.45845\sqrt[3]{x}$$

Roots:

$x = 0$

$x \approx 0.0913474$

0.0913474

Properties as a real function:

Domain

$\{x \in \mathbb{R} : x \geq 0\}$ (all non-negative real numbers)

Range

$$\{y \in \mathbb{R} : y \geq -\frac{97\,309\,231\,323\,612\,936\,700\,370\,667\,523\,232\,407\,938\,647\,037\,037\,359}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}\}$$

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

Derivative:

$$\frac{d}{dx}\left(2.17325\left(\sqrt[6]{x} - 0.671093\right)\sqrt[3]{x}\right) = \frac{1.08663\sqrt[6]{x} - 0.486151}{x^{2/3}}$$

Indefinite integral:

$$\int 2.17325\left(-0.671093 + \sqrt[6]{x}\right)\sqrt[3]{x}\,dx = 1.44883\,x^{3/2} - 1.09384\,x^{4/3} + \text{constant}$$

Global minimum:

$$\min\left\{2.17325\left(\sqrt[6]{x}-0.671093\right)\sqrt[3]{x}\right\}=-\frac{2627349245737548116401}{27000000000000000000000}$$

$$\text{at } x=\frac{91347413105703468120568152353201449}{11390625000000000000000000000000000000}$$

We take:

$$\left(2.17325\sqrt[6]{x}-1.45845\right)\sqrt[3]{x}$$

(-1.45845 + 2.17325 x^(1/6)) x^(1/3)

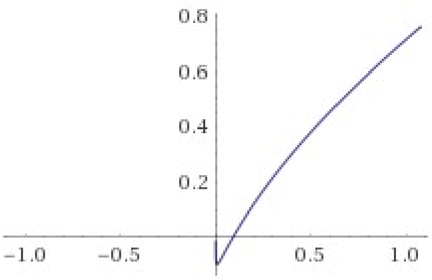
Input interpretation:

$$\left(-1.45845+2.17325\sqrt[6]{x}\right)\sqrt[3]{x}$$

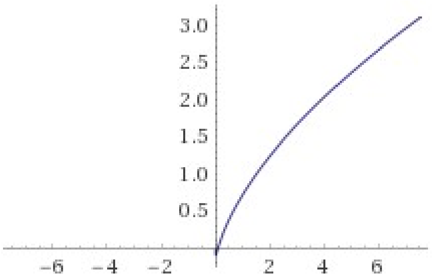
Result:

$$\left(2.17325\sqrt[6]{x}-1.45845\right)\sqrt[3]{x}$$

Plots:



(x from -1.1 to 1.1)



(x from -7.5 to 7.5)

Alternate form:

$$2.17325\left(\sqrt[6]{x}-0.671092\right)\sqrt[3]{x}$$

Expanded form:

$2.17325 \sqrt{x} - 1.45845 \sqrt[3]{x}$

Roots:

$x = 0$

$x \approx 0.091346$

0.091346

Properties as a real function:

Domain

$\{x \in \mathbb{R} : x \geq 0\}$ (all non-negative real numbers)

Range

$\{y \in \mathbb{R} : y \geq -\frac{919\,180\,616\,067}{9\,446\,031\,125\,000}\}$

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

Derivative:

$$\frac{d}{dx}\left(\left(2.17325 \sqrt[6]{x} - 1.45845\right) \sqrt[3]{x}\right) = \frac{1.08663 \sqrt[6]{x} - 0.48615}{x^{2/3}}$$

Indefinite integral:

$$\int \left(-1.45845 + 2.17325 \sqrt[6]{x}\right) \sqrt[3]{x}\, dx = 1.44883\, x^{3/2} - 1.09384\, x^{4/3} + \text{constant}$$

Global minimum:

$$\min\left\{\left(2.17325 \sqrt[6]{x} - 1.45845\right) \sqrt[3]{x}\right\} = -\frac{919\,180\,616\,067}{9\,446\,031\,125\,000}$$

$$\text{at } x = \frac{54\,073\,152\,317\,011\,818\,147\,103\,296}{6\,742\,766\,241\,013\,875\,283\,472\,640\,625}$$

We take:

$$\frac{d}{dx}\left(\left(2.17325 \sqrt[6]{x} - 1.45845\right) \sqrt[3]{x}\right) = \frac{1.08663 \sqrt[6]{x} - 0.48615}{x^{2/3}}$$

(-0.48615 + 1.08663 (0.091346)^(1/6))/(0.091346)^(2/3)

Input interpretation:

$$\frac{-0.48615 + 1.08663 \sqrt[6]{0.091346}}{0.091346^{2/3}}$$

Result:

1.19845...

1.19845...

(-0.48615 + x (0.091346)^(1/6))/(0.091346)^(2/3) = 1.19845

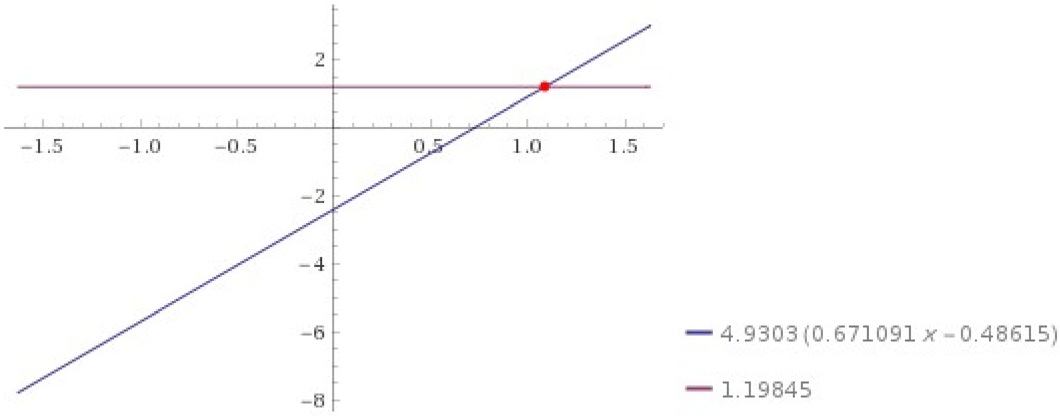
Input interpretation:

$$\frac{-0.48615 + x \sqrt[6]{0.091346}}{0.091346^{2/3}} = 1.19845$$

Result:

$4.9303 (0.671091 x - 0.48615) = 1.19845$

Plot:



Alternate forms:

$3.30868 (x - 0.724417) = 1.19845$

$3.30868 x - 3.59532 = 0$

$3.30868 x - 2.39687 = 1.19845$

Solution:

$x \approx 1.08663$

1.08663

From:

$$\frac{-0.48615 + x\sqrt[6]{0.091346}}{0.091346^{2/3}} = 1.19845$$

and:

$x \approx 0.091346$

0.091346

we obtain:

-11*1/10^56 + 1/10^52*((((-0.48615 + 1.08663 (0.091346)^(1/6))/(0.091346)^(2/3) - 0.091346)))

Input interpretation:

$$-11 \times \frac{1}{10^{56}} + \frac{1}{10^{52}} \left(\frac{-0.48615 + 1.08663\sqrt[6]{0.091346}}{0.091346^{2/3}} - 0.091346 \right)$$

Result:

$1.10600... \times 10^{-52}$

$1.10600...*10^{-52}$

result very near to the value of Cosmological Constant $1.1056 * 10^{-52}$ m^{-2}

From the following previous result $5.12357...*10^{-8}$, and the following expression:

(((1/24 (28 - 54 e + 45 e^2 - 30 sqrt(1 + e) + 3 sqrt(1 + e^2) - 17 π - 28 π^2 + 62 sqrt(1 + π^2)))))

Input:

$$\frac{1}{24}\left(28 - 54 e + 45 e^2 - 30\sqrt{1+e} + 3\sqrt{1+e^2} - 17\pi - 28\pi^2 + 62\sqrt{1+\pi^2}\right)$$

Decimal approximation:

1.633885091243601871254304990313434242520174971195523935210...

$1.6338850912.... \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934 ...$

Alternate forms:

$$\frac{1}{24}\left(28 - 30\sqrt{1+e} + 9 e (5 e - 6) + 3\sqrt{1+e^2} - \pi(17 + 28\pi) + 62\sqrt{1+\pi^2}\right)$$

$$-\frac{9e}{4}+\frac{15e^2}{8}+\frac{1}{24}\left(28-30\sqrt{1+e}+3\sqrt{1+e^2}-17\pi-28\pi^2+62\sqrt{1+\pi^2}\right)$$

$$\frac{7}{6}-\frac{9e}{4}+\frac{15e^2}{8}-\frac{5\sqrt{1+e}}{4}+\frac{\sqrt{1+e^2}}{8}-\frac{17\pi}{24}-\frac{7\pi^2}{6}+\frac{31\sqrt{1+\pi^2}}{12}$$

Continued fraction:

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{86+\cfrac{1}{21+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{76+\cfrac{1}{11+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

$$\frac{1}{24}\left(28-54e+45e^2-30\sqrt{1+e}+3\sqrt{1+e^2}-17\pi-28\pi^2+62\sqrt{1+\pi^2}\right)=$$
$$\frac{7}{6}-\frac{9e}{4}+\frac{15e^2}{8}-\frac{17\pi}{24}-\frac{7\pi^2}{6}+\sum_{k=0}^{\infty}\frac{1}{24}\binom{\frac{1}{2}}{k}\left(-30e^{-k}\sqrt{e}+3(e^2)^{-k}\sqrt{e^2}+62(\pi^2)^{-k}\sqrt{\pi^2}\right)$$

$$\frac{1}{24}\left(28-54e+45e^2-30\sqrt{1+e}+3\sqrt{1+e^2}-17\pi-28\pi^2+62\sqrt{1+\pi^2}\right)=$$
$$\frac{7}{6}-\frac{9e}{4}+\frac{15e^2}{8}-\frac{17\pi}{24}-\frac{7\pi^2}{6}+\sum_{k=0}^{\infty}\left(-\frac{5}{4}e^{-k}\binom{\frac{1}{2}}{k}\sqrt{e}+\frac{1}{8}(e^2)^{-k}\binom{\frac{1}{2}}{k}\sqrt{e^2}+\frac{31}{12}(\pi^2)^{-k}\binom{\frac{1}{2}}{k}\sqrt{\pi^2}\right)$$

$$\frac{1}{24}\left(28-54e+45e^2-30\sqrt{1+e}+3\sqrt{1+e^2}-17\pi-28\pi^2+62\sqrt{1+\pi^2}\right)=$$
$$\frac{7}{6}-\frac{9e}{4}+\frac{15e^2}{8}-\frac{17\pi}{24}-\frac{7\pi^2}{6}+\sum_{k=0}^{\infty}\frac{1}{24\,k!}(-1)^k e^{-k}(e^2)^{-k}(\pi^2)^{-k}\left(-\frac{1}{2}\right)_k\left(-30(e^2)^k(\pi^2)^k\sqrt{e}+e^k\left(3(\pi^2)^k\sqrt{e^2}+62(e^2)^k\sqrt{\pi^2}\right)\right)$$

we obtain:

(5.12357e-8)^(((1/24 (28 - 54 e + 45 e^2 - 30 sqrt(1 + e) + 3 sqrt(1 + e^2) - 17 π - 28 π^2 + 62 sqrt(1 + π^2)))))^4

Input interpretation:

$$(5.12357\times 10^{-8})^{\left(1/24\left(28-54\,e+45\,e^2-30\sqrt{1+e}+3\sqrt{1+e^2}-17\pi-28\pi^2+62\sqrt{1+\pi^2}\right)\right)^4}$$

Result:

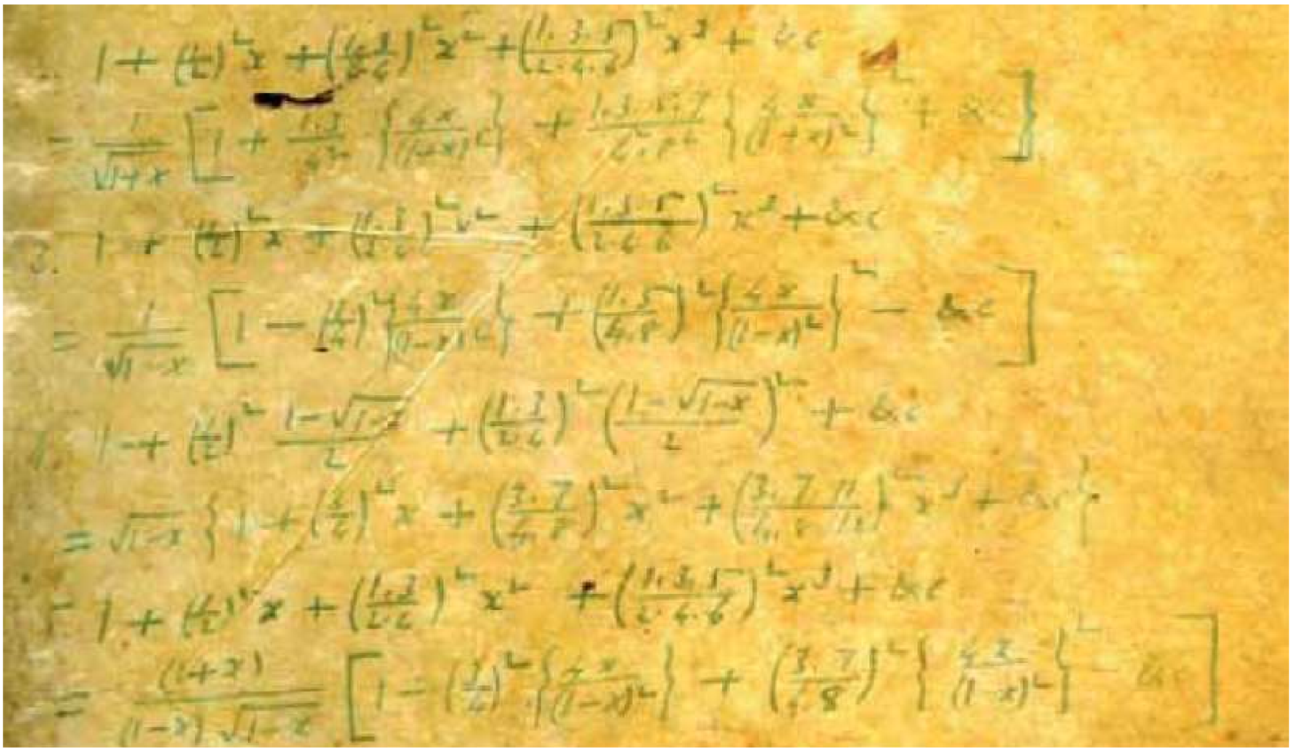
$1.10561\ldots \times 10^{-52}$

1.10561…*10^{-52} result practically equal to the Cosmological Constant

From:

Manuscript Book I of Srinivasa Ramanujan

Page 216



1/(sqrt(1+2)) *
((((1+3/4^2*((4*2)/(1+2)^2)+(1*3*5*7)/(4^2*8^2)*((4*2)/(1+2)^2)^2))))

Input:

$$\frac{1}{\sqrt{1+2}}\left(1+\frac{3}{4^2}\times\frac{4\times 2}{(1+2)^2}+\frac{3\times 5\times 7}{4^2\times 8^2}\left(\frac{4\times 2}{(1+2)^2}\right)^2\right)$$

Result:

$$\frac{539}{432\sqrt{3}}$$

Decimal approximation:

0.720351377530574738588961094191099695819577185033792560588...

0.72035137753….

Alternate form:

$$\frac{539\sqrt{3}}{1296}$$

sqrt[2/((((1/(sqrt(1+2)) *
((((1+3/4^2*((4*2)/(1+2)^2)+(1*3*5*7)/(4^2*8^2)*((4*2)/(1+2)^2)^2))))))))] -
(47+2)/10^3

where 47 and 2 are Lucas numbers

Input:

$$\sqrt{\frac{2}{\frac{1}{\sqrt{1+2}}\left(1+\frac{3}{4^2}\times\frac{4\times 2}{(1+2)^2}+\frac{3\times 5\times 7}{4^2\times 8^2}\left(\frac{4\times 2}{(1+2)^2}\right)^2\right)}}-\frac{47+2}{10^3}$$

Result:

$$\frac{12}{7}\sqrt{\frac{2}{11}}\,3^{3/4}-\frac{49}{1000}$$

Decimal approximation:

1.617260128504324116813239310276394886267364028444305027275...

1.6172601285…. result that is a good approximation to the value of the golden ratio 1,618033988749...

Alternate forms:

$$\frac{12\,000\times 3^{3/4}\sqrt{22}-3773}{77\,000}$$

$$\frac{12\,000\sqrt{\frac{2}{11}}\,3^{3/4}-343}{7000}$$

$$\frac{12}{77}\left(3^{3/4}\sqrt{22}\right)-\frac{49}{1000}$$

1/(((((sqrt[2/((((1/(sqrt(1+2)) * ((((1+3/4^2*((4*2)/(1+2)^2)+(1*3*5*7)/(4^2*8^2)*((4*2)/(1+2)^2)^2)))))))] - (47+2)/10^3)))))

Input:

$$\frac{1}{\sqrt{\frac{2}{\frac{1}{\sqrt{1+2}}\left(1+\frac{3}{4^2}\times\frac{4\times 2}{(1+2)^2}+\frac{3\times 5\times 7}{4^2\times 8^2}\left(\frac{4\times 2}{(1+2)^2}\right)^2\right)}}-\frac{47+2}{10^3}}$$

Result:

$$\frac{1}{\frac{12}{7}\sqrt{\frac{2}{11}}\,3^{3/4}-\frac{49}{1000}}$$

Decimal approximation:

0.618329718500400333135466209025767512164686555837203513851...

0.6183297185… result that is a very good approximation to the value of the conjugate of golden ratio 0,618033988749...

Alternate forms:

$$\frac{77\,000}{12\,000\times 3^{3/4}\sqrt{22}-3773}$$

$$\frac{7000}{12\,000\sqrt{\frac{2}{11}}\,3^{3/4}-343}$$

$$\frac{-\frac{49}{1000}-\frac{12}{7}\sqrt{\frac{2}{11}}\,3^{3/4}}{\frac{2401}{1\,000\,000}-\frac{864\sqrt{3}}{539}}$$

We have also that:

[(((((1/(sqrt(1+2)) * ((((1+3/4^2*((4*2)/(1+2)^2)+(1*3*5*7)/(4^2*8^2)*((4*2)/(1+2)^2)^2))))))))]^1/32

Input:

$$\sqrt[32]{\frac{1}{\sqrt{1+2}}\left(1+\frac{3}{4^2}\times\frac{4\times2}{(1+2)^2}+\frac{3\times5\times7}{4^2\times8^2}\left(\frac{4\times2}{(1+2)^2}\right)^2\right)}$$

Exact result:

$$\frac{\sqrt[16]{7}\ \sqrt[32]{11}}{\sqrt[8]{2}\ 3^{7/64}}$$

Decimal approximation:

0.989801852325518760566781404951068967672174103093435938789...

0.9898018523255….

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

4*log base 0.989801852325518[(((((1/(sqrt(1+2)) * ((((1+3/4^2*((4*2)/(1+2)^2)+(1*3*5*7)/(4^2*8^2)*((4*2)/(1+2)^2)^2))))))))]-Pi+1/golden ratio

Input interpretation:

$$4\log_{0.989801852325518}\left(\frac{1}{\sqrt{1+2}}\left(1+\frac{3}{4^2}\times\frac{4\times2}{(1+2)^2}+\frac{3\times5\times7}{4^2\times8^2}\left(\frac{4\times2}{(1+2)^2}\right)^2\right)\right)-\pi+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

125.4764413352...

125.4764413352…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18

Alternative representation:

$$4\log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times 2)}{4^2(1+2)^2}+\frac{(3\times 5\times 7)\left(\frac{4\times 2}{(1+2)^2}\right)^2}{4^2\times 8^2}}{\sqrt{1+2}}\right)-\pi+\frac{1}{\phi}=$$

$$-\pi+\frac{1}{\phi}+\frac{4\log\left(\frac{1+\frac{24}{9\times 4^2}+\frac{105\left(\frac{8}{9}\right)^2}{4^2\times 8^2}}{\sqrt{3}}\right)}{\log(0.9898018523255180000)}$$

Series representations:

$$4\log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times 2)}{4^2(1+2)^2}+\frac{(3\times 5\times 7)\left(\frac{4\times 2}{(1+2)^2}\right)^2}{4^2\times 8^2}}{\sqrt{1+2}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi-\frac{4\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{539}{432\sqrt{3}}\right)^k}{k}}{\log(0.9898018523255180000)}$$

$$4\log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times 2)}{4^2(1+2)^2}+\frac{(3\times 5\times 7)\left(\frac{4\times 2}{(1+2)^2}\right)^2}{4^2\times 8^2}}{\sqrt{1+2}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+4\log_{0.9898018523255180000}\left(\frac{539}{432\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}}\right)$$

$$4\log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times 2)}{4^2(1+2)^2}+\frac{(3\times 5\times 7)\left(\frac{4\times 2}{(1+2)^2}\right)^2}{4^2\times 8^2}}{\sqrt{1+2}}\right)-\pi+\frac{1}{\phi}=$$

$$\frac{1}{\phi}-\pi+4\log_{0.9898018523255180000}\left(\frac{539}{432\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)$$

and:

4*log base 0.989801852325518[((((1/(sqrt(1+2)) * ((((1+3/4^2*((4*2)/(1+2)^2)+(1*3*5*7)/(4^2*8^2)*((4*2)/(1+2)^2)^2))))))))]+11+1/golden ratio

where 11 is a Lucas number

Input interpretation:

$$4 \log_{0.989801852325518}\left(\frac{1}{\sqrt{1+2}}\left(1+\frac{3}{4^2}\times\frac{4\times 2}{(1+2)^2}+\frac{3\times 5\times 7}{4^2\times 8^2}\left(\frac{4\times 2}{(1+2)^2}\right)^2\right)\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.6180339887...

139.6180339887… result practically equal to the rest mass of Pion meson 139.57

Alternative representation:

$$4 \log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times 2)}{4^2(1+2)^2}+\frac{(3\times 5\times 7)\left(\frac{4\times 2}{(1+2)^2}\right)^2}{4^2\times 8^2}}{\sqrt{1+2}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\frac{4\log\left(\frac{1+\frac{24}{9\times 4^2}+\frac{105\left(\frac{8}{9}\right)^2}{4^2\times 8^2}}{\sqrt{3}}\right)}{\log(0.9898018523255180000)}$$

Series representations:

$$4 \log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times 2)}{4^2(1+2)^2}+\frac{(3\times 5\times 7)\left(\frac{4\times 2}{(1+2)^2}\right)^2}{4^2\times 8^2}}{\sqrt{1+2}}\right)+11+\frac{1}{\phi}=$$

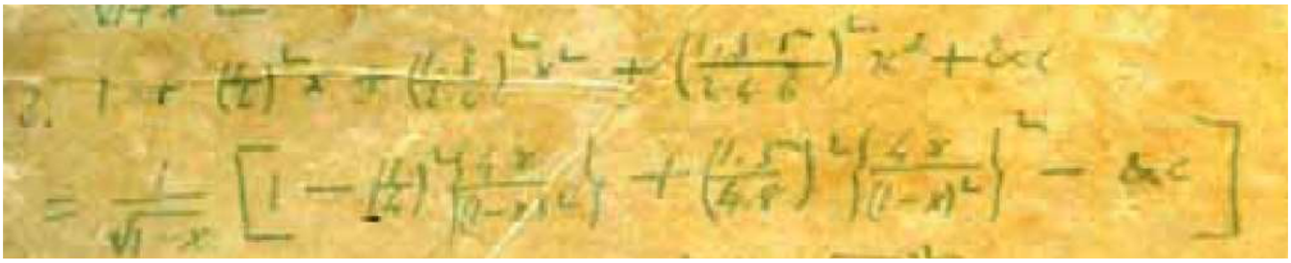
$$11+\frac{1}{\phi}-\frac{4\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{539}{432\sqrt{3}}\right)^k}{k}}{\log(0.9898018523255180000)}$$

$$4\log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times2)}{4^2(1+2)^2}+\frac{(3\times5\times7)\left(\frac{4\times2}{(1+2)^2}\right)^2}{4^2\times8^2}}{\sqrt{1+2}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+4\log_{0.9898018523255180000}\left(\frac{539}{432\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}}\right)$$

$$4\log_{0.9898018523255180000}\left(\frac{1+\frac{3(4\times2)}{4^2(1+2)^2}+\frac{(3\times5\times7)\left(\frac{4\times2}{(1+2)^2}\right)^2}{4^2\times8^2}}{\sqrt{1+2}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+4\log_{0.9898018523255180000}\left(\frac{539}{432\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)$$



1/(sqrt(1-2)) * ((((1-(1/4)^2*((4*2)/(1-2)^2)+(((1*5)/(4*8)))^2*((4*2)/(1-2)^2)^2))))

Input:

$$\frac{1}{\sqrt{1-2}}\left(1-\left(\frac{1}{4}\right)^2\times\frac{4\times2}{(1-2)^2}+\left(\frac{1\times5}{4\times8}\right)^2\left(\frac{4\times2}{(1-2)^2}\right)^2\right)$$

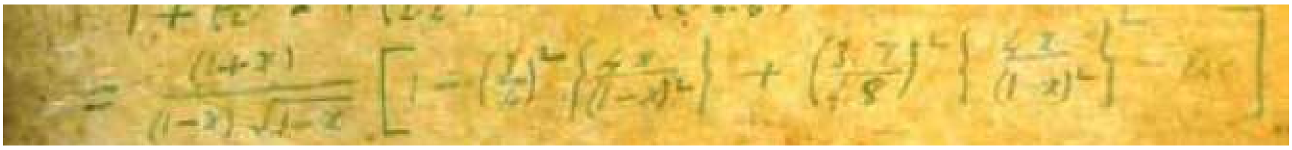
Result:

$$-\frac{33\,i}{16}$$

Polar coordinates:

$r\approx 2.0625$ (radius), $\theta=-90°$ (angle)

2.0625



(1+2)/(((1-2)*sqrt(1-2))) * [1-(3/4)^2*((4*2)/(1-2)^2)+((3*7)/(4*8))^2*(((4*2)/(1-2)^2))^2]

Input:

$$\frac{1+2}{(1-2)\sqrt{1-2}}\left(1-\left(\frac{3}{4}\right)^2\times\frac{4\times 2}{(1-2)^2}+\left(\frac{3\times 7}{4\times 8}\right)^2\left(\frac{4\times 2}{(1-2)^2}\right)^2\right)$$

Result:

$$\frac{1155\, i}{16}$$

Decimal form:

$72.1875\, i$

Polar coordinates:

$r \approx 72.1875$ (radius), $\theta = 90°$ (angle)

72.1875

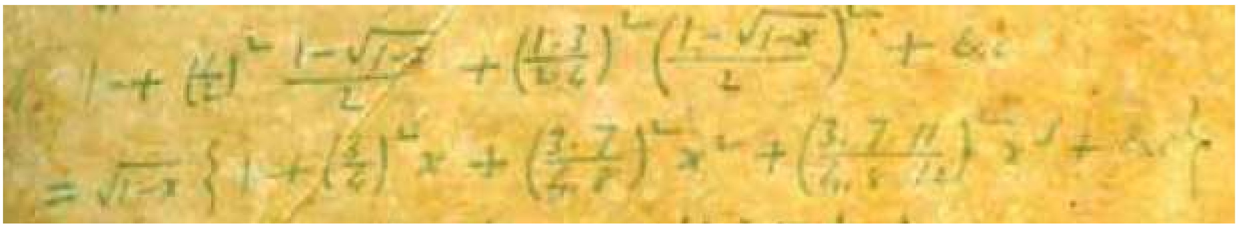
Alternate form:

$$\frac{1155\, i}{16}$$

Continued fraction:

$[72i; -5i, 3i]$

(using the Hurwitz expansion)



sqrt(1-2) * (((1+2*(3/4)^2+2^2*((3*7)/(4*8))^2+2^3((3*7*11)/(4*8*12))^2)))

Input:

$$\sqrt{1-2}\left(1+2\left(\frac{3}{4}\right)^2+2^2\left(\frac{3\times 7}{4\times 8}\right)^2+2^3\left(\frac{3\times 7\times 11}{4\times 8\times 12}\right)^2\right)$$

Result:

$$\frac{13809\,i}{2048}$$

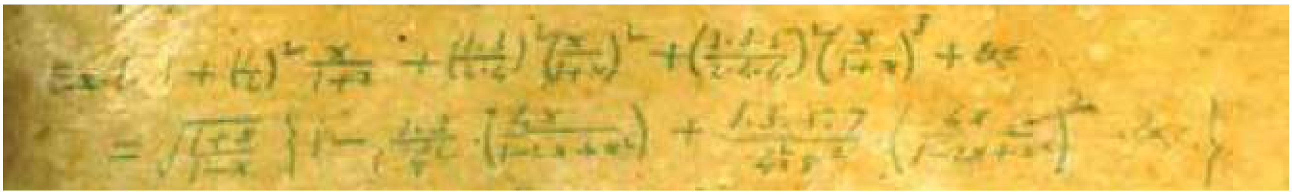
Decimal form:

6.74267578125 i

Polar coordinates:

$r \approx 6.74268$ (radius), $\theta = 90°$ (angle)

6.74268



sqrt(((1+2)/(1-2)))*((((((1-(1*3)/(4)^2 * ((4*2)/(1-2*2+2^2))+(1*3*5*7)/(4^2*8^2)*((4*2)/(1-2*2+2^2))^2)))))

Input:

$$\sqrt{\frac{1+2}{1-2}}\left(1-\frac{1\times 3}{4^2}\times\frac{4\times 2}{1-2\times 2+2^2}+\frac{3\times 5\times 7}{4^2\times 8^2}\left(\frac{4\times 2}{1-2\times 2+2^2}\right)^2\right)$$

Result:

$$\frac{97\,i\sqrt{3}}{16}$$

Decimal approximation:

10.50055802088631859201014344537935122459075685122543255758... i

10.50055802…i

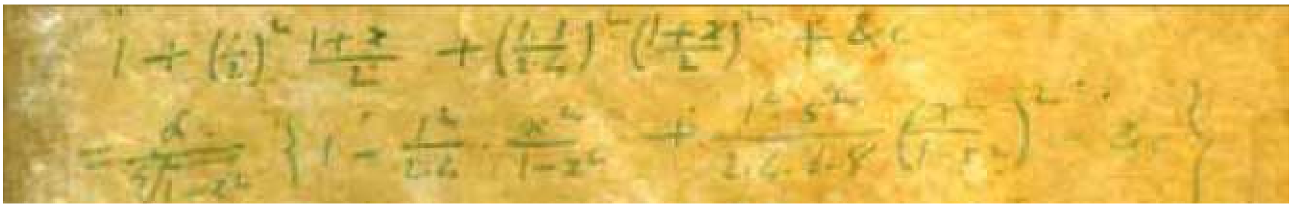
Polar coordinates:

$r \approx 10.5006$ (radius), $\theta = 90°$ (angle)

10.5006

Alternate form:

$$\frac{1}{16}\,i\sqrt{3}\;97$$



2/(1-4)^1/5*((((1-1/8*2^2/(1-4)+5^2/(2*4*6*8)*(2^2/(1-4))^2))))

Input:

$$\frac{2}{\sqrt[5]{1-4}}\left(1-\frac{1}{8}\times\frac{2^2}{1-4}+\frac{5^2}{2\times4\times6\times8}\left(\frac{2^2}{1-4}\right)^2\right)$$

Result:

$$-\frac{277\,(-1)^{4/5}}{108\sqrt[5]{3}}$$

Decimal approximation:

1.66567170054413256023744471976347199183303467998566449844... − 1.21018132814032252180795053575087558592044061830491417446... i

Polar coordinates:

$r \approx 2.05888$ (radius), $\theta = -36°$ (angle)

2.05888

Alternate forms:

$$-\frac{277}{324}(-3)^{4/5}$$

$$\frac{277}{432\sqrt[5]{3}}+\frac{277\sqrt{5}}{432\sqrt[5]{3}}-\frac{277\,i\sqrt{\frac{5}{8}-\frac{\sqrt{5}}{8}}}{108\sqrt[5]{3}}$$

$$-\frac{277\,e^{(4\,i\,\pi)/5}}{108\sqrt[5]{3}}$$

Results

0.72035137753; 2.0625; 72.1875; 6.74268; 10.5006; 2.05888

From the sum of these results, multiplied by 11, subtracting 18 (that are Lucas numbers) and adding the golden ratio conjugate, we obtain:

(0.72035137753 + 2.0625 + 72.1875 + 6.74268 + 10.5006 + 2.05888)*11-18+1/golden ratio

Input interpretation:

$$(0.72035137753 + 2.0625 + 72.1875 + 6.74268 + 10.5006 + 2.05888) \times 11 - 18 + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1019.62...

1019.62… result practically equal to the rest mass of Phi meson 1019.445...

Alternative representations:

$$(0.720351377530000 + 2.0625 + 72.1875 + 6.74268 + 10.5006 + 2.05888)\, 11 - 18 + \frac{1}{\phi} = 1019. + \frac{1}{2 \sin(54\,°)}$$

$$(0.720351377530000 + 2.0625 + 72.1875 + 6.74268 + 10.5006 + 2.05888)\, 11 - 18 + \frac{1}{\phi} = 1019. + -\frac{1}{2 \cos(216\,°)}$$

$$(0.720351377530000 + 2.0625 + 72.1875 + 6.74268 + 10.5006 + 2.05888)\, 11 - 18 + \frac{1}{\phi} = 1019. + -\frac{1}{2 \sin(666\,°)}$$

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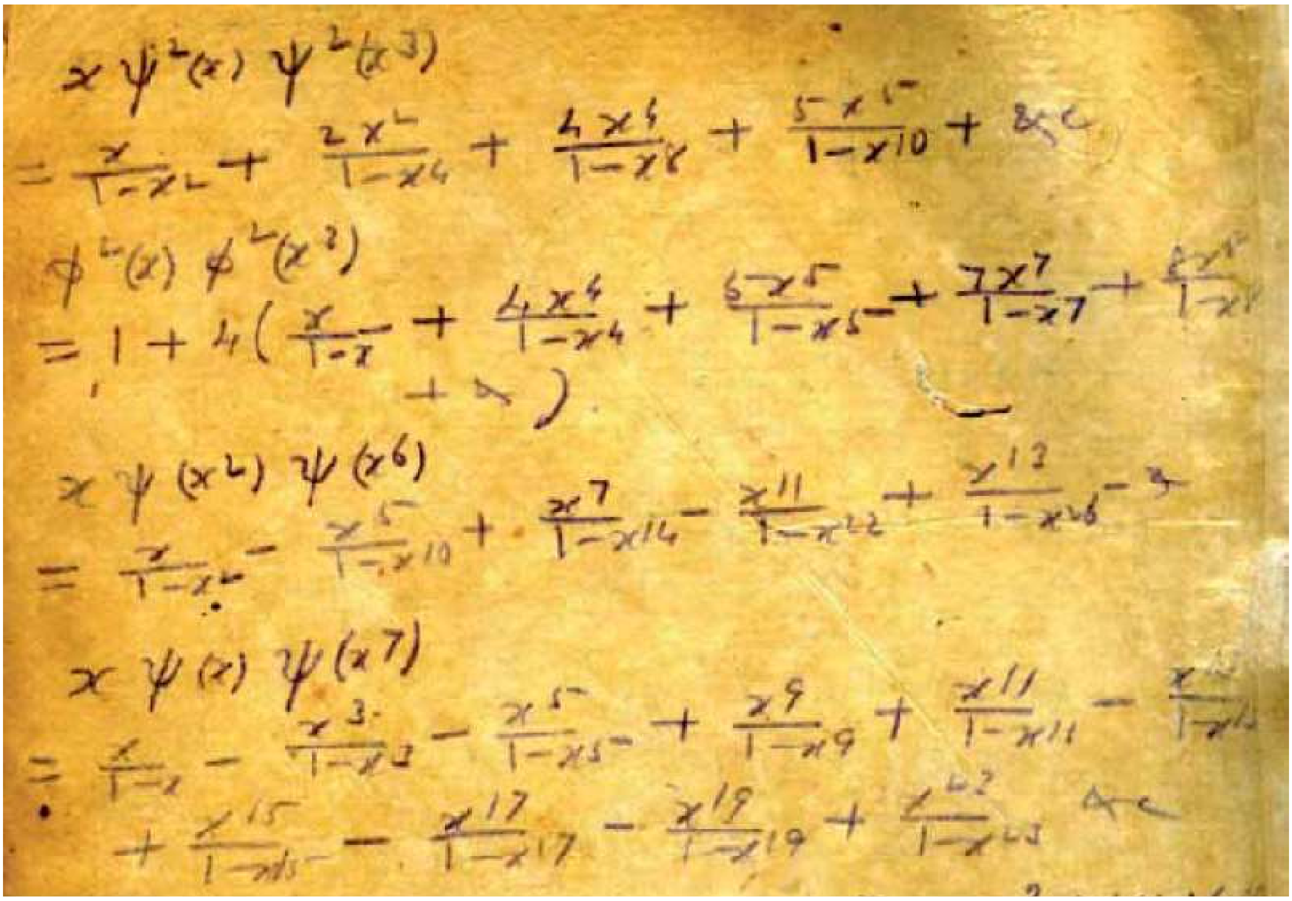


$x\psi^2(x)\psi^2(x^3)$
$= \frac{x}{1-x^2} + \frac{2x^2}{1-x^4} + \frac{4x^4}{1-x^8} + \frac{5x^5}{1-x^{10}} + \&c$

$\phi^2(x)\phi^2(x^3)$
$= 1 + 4\left(\frac{x}{1-x} + \frac{4x^4}{1-x^4} + \frac{6x^5}{1-x^5} + \frac{7x^7}{1-x^7} + \frac{8x^8}{1-x^8} + \&c\right)$

$x\psi(x^2)\psi(x^6)$
$= \frac{x}{1-x^2} - \frac{x^5}{1-x^{10}} + \frac{x^7}{1-x^{14}} - \frac{x^{11}}{1-x^{22}} + \frac{x^{13}}{1-x^{26}} - \&c$

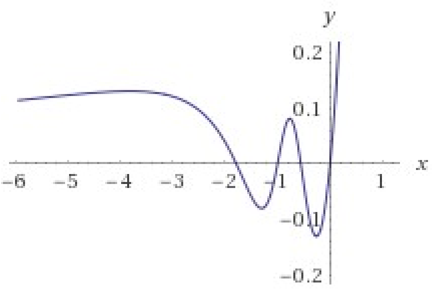
$x\psi(x)\psi(x^7)$
$= \frac{x}{1-x} - \frac{x^3}{1-x^3} - \frac{x^5}{1-x^5} + \frac{x^9}{1-x^9} + \frac{x^{11}}{1-x^{11}} - \frac{x^{13}}{1-x^{13}} + \frac{x^{15}}{1-x^{15}} - \frac{x^{17}}{1-x^{17}} - \frac{x^{19}}{1-x^{19}} + \frac{x^{23}}{1-x^{23}}$ &c

x/(1-x^2)+(2x^2)/(1-x^4)+(4x^4)/(1-x^8)+(5x^5)/(1-x^10)...

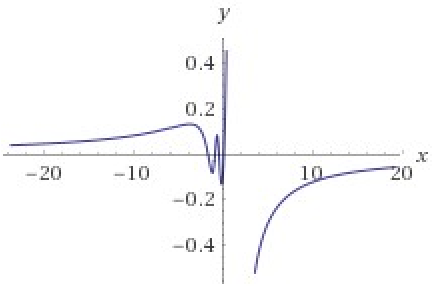
Input:

$$\frac{x}{1-x^2} + \frac{2x^2}{1-x^4} + \frac{4x^4}{1-x^8} + \frac{5x^5}{1-x^{10}}$$

Plots:



(x from -5.9 to 1.2)



Alternate forms:

$$x\left(-\frac{2x}{x^4-1}+\frac{1}{1-x^2}-\frac{5x^4}{x^{10}-1}-\frac{4x^3}{x^8-1}\right)$$

$$-\frac{x(x+1)(x^{10}+4x^7-x^6+2x^5-x^4+4x^3+1)}{(x-1)(x^4+1)(x^4-x^3+x^2-x+1)(x^4+x^3+x^2+x+1)}$$

(ignoring removable singularities)

Partial fraction expansion:

$$-\frac{2}{x^4+1}+\frac{x^3-2x^2+3x-4}{2(x^4-x^3+x^2-x+1)}+\frac{x^3+2x^2+3x+4}{2(x^4+x^3+x^2+x+1)}-\frac{2}{x-1}$$

(ignoring removable singularities)

Series expansion at x = 0:

$$x+2x^2+x^3+4x^4+6x^5+O(x^6)$$

(Taylor series)

Series expansion at x = ∞:

$$-\frac{1}{x}-\frac{2}{x^2}-\left(\frac{1}{x}\right)^3-\frac{4}{x^4}+O\left(\left(\frac{1}{x}\right)^5\right)$$

(Laurent series)

Derivative:

$$\frac{d}{dx}\left(\frac{x}{1-x^2}+\frac{2x^2}{1-x^4}+\frac{4x^4}{1-x^8}+\frac{5x^5}{1-x^{10}}\right)=$$
$$-\frac{4x}{x^4-1}+\frac{2x^2}{(1-x^2)^2}+\frac{1}{1-x^2}+\frac{50x^{14}}{(1-x^{10})^2}+\frac{32x^{11}}{(1-x^8)^2}-\frac{25x^4}{x^{10}-1}-\frac{16x^3}{x^8-1}+\frac{8x^5}{(1-x^4)^2}$$

Indefinite integral:

$$\int\left(\frac{x}{1-x^2}+\frac{2x^2}{1-x^4}+\frac{4x^4}{1-x^8}+\frac{5x^5}{1-x^{10}}\right)dx =$$

$$\frac{1}{8}\left(-4\log(1-x^2)+2\sqrt{2}\log\left(x^2-\sqrt{2}\,x+1\right)-2\sqrt{2}\log\left(x^2+\sqrt{2}\,x+1\right)+\right.$$
$$\left(1+\sqrt{5}\right)\log\left(2x^2+\left(-1-\sqrt{5}\right)x+2\right)-\left(\sqrt{5}-1\right)\log\left(2x^2+\left(1-\sqrt{5}\right)x+2\right)-$$
$$\left(\sqrt{5}-1\right)\log\left(2x^2+\left(\sqrt{5}-1\right)x+2\right)+\left(1+\sqrt{5}\right)\log\left(2x^2+\left(1+\sqrt{5}\right)x+2\right)-$$
$$12\log(1-x)+4\log(x+1)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+$$
$$2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x-\sqrt{5}+1}{\sqrt{2(5+\sqrt{5})}}\right)-2\sqrt{2\left(5+\sqrt{5}\right)}$$
$$\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2(5+\sqrt{5})}}\right)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+$$
$$\left.4\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\,x\right)-4\sqrt{2}\tan^{-1}\left(\sqrt{2}\,x+1\right)\right)+\text{constant}$$

(assuming a complex-valued logarithm)

Or:

Indefinite integral:

$$\int\left(\frac{x}{1-x^2}+\frac{2x^2}{1-x^4}+\frac{4x^4}{1-x^8}+\frac{5x^5}{1-x^{10}}\right)dx \approx$$
$$0.125\,(4.70228\tan^{-1}(0.425325\,(3.23607-4x))-4\log(1-x^2)+$$
$$2.82843\log(x^2-1.41421x+1)-2.82843\log(x^2+1.41421x+1)+$$
$$3.23607\log(2x^2-3.23607x+2)-1.23607\log(2x^2-1.23607x+2)-$$
$$1.23607\log(2x^2+1.23607x+2)+3.23607\log(2x^2+3.23607x+2)-$$
$$12\log(1-x)+4\log(x+1)+5.65685\tan^{-1}(1-1.41421x)-$$
$$5.65685\tan^{-1}(1.41421x+1)+7.60845\tan^{-1}(0.262866\,(4x-1.23607))-$$
$$7.60845\tan^{-1}(0.262866\,(4x+1.23607))+$$
$$4.70228\tan^{-1}(0.425325\,(4x+3.23607)))+\text{constant}$$

(assuming a complex-valued logarithm)

For x = 1, we obtain:

7.60845 tan^(-1)(0.262866 (3.23607)) - 7.60845 tan^(-1)(0.262866 (5.23607)) + 4.70228 tan^(-1)(0.425325 (7.23607))

Input interpretation:

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) + \tan^{-1}(0.262866 \times 5.23607) \times (-7.60845) + 4.70228 \tan^{-1}(0.425325 \times 7.23607)$$

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

Result:

4.10125...

(result in radians)

4.10125…

Alternative representations:

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = 7.60845 \operatorname{sc}^{-1}(0.850653 \mid 0) - 7.60845 \operatorname{sc}^{-1}(1.37638 \mid 0) + 4.70228 \operatorname{sc}^{-1}(3.07768 \mid 0)$$

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = 7.60845 \cot^{-1}\left(\frac{1}{0.850653}\right) - 7.60845 \cot^{-1}\left(\frac{1}{1.37638}\right) + 4.70228 \cot^{-1}\left(\frac{1}{3.07768}\right)$$

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = 7.60845 \tan^{-1}(1, 0.850653) - 7.60845 \tan^{-1}(1, 1.37638) + 4.70228 \tan^{-1}(1, 3.07768)$$

Series representations:

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = \sum_{k=0}^{\infty} \left(\frac{7.60845 \left(-\frac{1}{5}\right)^k 1.70131^{1+2k} F_{1+2k} \left(\frac{1}{1+\sqrt{1.57889}}\right)^{1+2k}}{1+2k} - \frac{7.60845 \left(-\frac{1}{5}\right)^k 2.75277^{1+2k} F_{1+2k} \left(\frac{1}{1+\sqrt{2.51555}}\right)^{1+2k}}{1+2k} + \frac{4.70228 \left(-\frac{1}{5}\right)^k 6.15536^{1+2k} F_{1+2k} \left(\frac{1}{1+\sqrt{8.5777}}\right)^{1+2k}}{1+2k} \right)$$

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = 0 + 4.70228 \tan^{-1}(z_0) + \sum_{k=1}^{\infty} \frac{1}{k} i \left(3.80423 (0.850653 - z_0)^k - 3.80423 (1.37638 - z_0)^k + 2.35114 (3.07768 - z_0)^k\right) \left(-(-i - z_0)^{-k} + (i - z_0)^{-k}\right)$$

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

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = 0 + 4.70228 \tan^{-1}(x) + 7.60845 \pi \left\lfloor \frac{\arg(i (0.850653 - x))}{2 \pi} \right\rfloor - 7.60845 \pi \left\lfloor \frac{\arg(i (1.37638 - x))}{2 \pi} \right\rfloor + 4.70228 \pi \left\lfloor \frac{\arg(i (3.07768 - x))}{2 \pi} \right\rfloor + \sum_{k=1}^{\infty} \frac{1}{k} i \left(3.80423 (0.850653 - x)^k - 3.80423 (1.37638 - x)^k + 2.35114 (3.07768 - x)^k\right) \left(-(-i - x)^{-k} + (i - x)^{-k}\right)$$ for $(i x \in \mathbb{R}$ and $i x < -1)$

Integral representations:

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = \int_0^1 \frac{0.806497 + 0.360688 t^2 + 4.94426 t^4}{0.0770138 + 0.931109 t^2 + 2.01539 t^4 + t^6} \, dt$$

$$7.60845 \tan^{-1}(0.262866 \times 3.23607) - 7.60845 \tan^{-1}(0.262866 \times 5.23607) + 4.70228 \tan^{-1}(0.425325 \times 7.23607) = \int_{-i \infty+\gamma}^{i \infty+\gamma} \frac{1}{\pi^{3/2}} e^{-3.95593 s} \left(-3.61803 e^{1.60721 s} + 2.61804 e^{2.89314 s} - 1.61804 e^{3.41151 s}\right) i \Gamma\left(\frac{1}{2} - s\right) \Gamma(1 - s) \Gamma(s)^2 \, ds$$ for $0 < \gamma < \frac{1}{2}$

$$7.60845\tan^{-1}(0.262866\times 3.23607) - 7.60845\tan^{-1}(0.262866\times 5.23607) + 4.70228\tan^{-1}(0.425325\times 7.23607) = \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1}{i\pi\,\Gamma\left(\frac{3}{2}-s\right)} e^{-2.88727 s} \left(3.61803 e^{0.638921 s} - 2.61804 e^{2.24835 s} + 1.61804 e^{3.21078 s}\right) \Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)\,ds \quad \text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$7.60845\tan^{-1}(0.262866\times 3.23607) - 7.60845\tan^{-1}(0.262866\times 5.23607) + 4.70228\tan^{-1}(0.425325\times 7.23607) = \frac{6.47215}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.72361 k^2}{1+2k}} - \frac{10.4722}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{1.89444 k^2}{1+2k}} + \frac{14.4721}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{9.47212 k^2}{1+2k}} = \frac{6.47215}{1+\frac{0.72361}{3+\frac{2.89444}{5+\frac{6.51249}{7+\frac{11.5778}{9+\dots}}}}} - \frac{10.4722}{1+\frac{1.89444}{3+\frac{7.57774}{5+\frac{17.0499}{7+\frac{30.311}{9+\dots}}}}} + \frac{14.4721}{1+\frac{9.47212}{3+\frac{37.8885}{5+\frac{85.2491}{7+\frac{151.554}{9+\dots}}}}}$$

$$7.60845\tan^{-1}(0.262866\times 3.23607) - 7.60845\tan^{-1}(0.262866\times 5.23607) + 4.70228\tan^{-1}(0.425325\times 7.23607) = \frac{6.47215}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{0.72361(1-2k)^2}{1.72361+0.55278 k}} - \frac{10.4722}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{1.89444(1-2k)^2}{2.89444-1.78887 k}} + \frac{14.4721}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{9.47212(1-2k)^2}{10.4721-16.9442 k}} = \frac{6.47215}{1+\frac{0.72361}{2.27639+\frac{6.51249}{2.82917+\frac{18.0903}{3.38195+\frac{35.4569}{3.93473+\dots}}}}} - \frac{10.4722}{1+\frac{1.89444}{1.10556+\frac{17.0499}{-0.683305+\frac{47.3609}{-2.47218+\frac{92.8273}{-4.26105+\dots}}}}} + \frac{14.4721}{1+\frac{9.47212}{-6.47212+\frac{85.2491}{-23.4164+\frac{236.803}{-40.3606+\frac{464.134}{-57.3049+\dots}}}}}$$

$$7.60845\tan^{-1}(0.262866\times 3.23607) - 7.60845\tan^{-1}(0.262866\times 5.23607) + 4.70228\tan^{-1}(0.425325\times 7.23607) = 10.4721 - \frac{4.68331}{3 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{0.72361\left(1+(-1)^{1+k}+k\right)^2}{3+2k}} + \frac{19.8388}{3 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{1.89444\left(1+(-1)^{1+k}+k\right)^2}{3+2k}} - \frac{137.082}{3 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{9.47212\left(1+(-1)^{1+k}+k\right)^2}{3+2k}} =$$

$$10.4721 - \frac{4.68331}{3 + \frac{6.51249}{5+\frac{2.89444}{7+\frac{18.0903}{9+\frac{11.5778}{11+\ldots}}}}} + \frac{19.8388}{3 + \frac{17.0499}{5+\frac{7.57774}{7+\frac{47.3609}{9+\frac{30.311}{11+\ldots}}}}} - \frac{137.082}{3 + \frac{85.2491}{5+\frac{37.8885}{7+\frac{236.803}{9+\frac{151.554}{11+\ldots}}}}}$$

$$7.60845\tan^{-1}(0.262866\times 3.23607) - 7.60845\tan^{-1}(0.262866\times 5.23607) + 4.70228\tan^{-1}(0.425325\times 7.23607) = \frac{6.47215}{1.72361 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{1.44722\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.36181+0.361805(-1)^k\right)(1+2k)}} - \frac{10.4722}{2.89444 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{3.78887\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1.94722+0.947218(-1)^k\right)(1+2k)}} + \frac{14.4721}{10.4721 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{18.9442\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(5.73606+4.73606(-1)^k\right)(1+2k)}} =$$

$$\frac{6.47215}{1.72361 + -\frac{1.44722}{3-\frac{1.44722}{8.61805-\frac{8.68332}{7-\frac{8.68332}{15.5125+\ldots}}}}} - \frac{10.4722}{2.89444 + -\frac{3.78887}{3-\frac{3.78887}{14.4722-\frac{22.7332}{7-\frac{22.7332}{26.0499+\ldots}}}}} + \frac{14.4721}{10.4721 + -\frac{18.9442}{3-\frac{18.9442}{52.3606-\frac{113.665}{7-\frac{113.665}{94.2491+\ldots}}}}}$$

For x = 2, also

1/8 [(-4 log(1 - 4) + 2 sqrt(2) log(4 - sqrt(2)*2 + 1) - 2 sqrt(2) log(4 + sqrt(2)*2 + 1) + (1 + sqrt(5)) log(8 + (-1 - sqrt(5))*2 + 2) - (sqrt(5) - 1) log(8 + (1 - sqrt(5))*2+ 2) - (sqrt(5) - 1) log(8 + (sqrt(5) - 1)*2 + 2) + (1 + sqrt(5)) log(8 + (1 + sqrt(5))*2 + 2) -

12 log(-1) + 4 log(3) + 2 sqrt(10 - 2 sqrt(5)) tan^(-1)((-8 + sqrt(5) + 1)/sqrt(10 - 2 sqrt(5))) + 2 sqrt(2 (5 + sqrt(5))) tan^(-1)((8 - sqrt(5) + 1)/sqrt(2 (5 + sqrt(5)))) - 2 sqrt(2 (5 + sqrt(5))) tan^(-1)((8+ sqrt(5) - 1)/sqrt(2 (5 + sqrt(5)))) + 2 sqrt(10 - 2 sqrt(5)) tan^(-1)((8+ sqrt(5) + 1)/sqrt(10 - 2 sqrt(5))) + 4 sqrt(2) tan^(-1)(1 - sqrt(2) *2) - 4 sqrt(2) tan^(-1)(sqrt(2) *2+ 1))]

a)

(-4 log(1 - 4) + 2 sqrt(2) log(4 - sqrt(2)*2 + 1) - 2 sqrt(2) log(4 + sqrt(2)*2 + 1) + (1 + sqrt(5)) log(8 + (-1 - sqrt(5))*2 + 2)

$$-4\log(1-4)+2\sqrt{2}\,\log\left(4-\sqrt{2}\times 2+1\right)-2\sqrt{2}\,\log\left(4+\sqrt{2}\times 2+1\right)+\left(1+\sqrt{5}\right)\log\left(8+\left(-1-\sqrt{5}\right)\times 2+2\right)$$

$$-4(\log(3)+i\pi)+2\sqrt{2}\,\log\left(5-2\sqrt{2}\right)-2\sqrt{2}\,\log\left(5+2\sqrt{2}\right)+\left(1+\sqrt{5}\right)\log\left(10+2\left(-1-\sqrt{5}\right)\right)$$

$$-3.941682243193027065940196493297539308951633135214733 0489\ldots-12.566370614359172953850573533118011536788677597500423283\ldots\, i$$

$r \approx 13.1701$ (radius), $\theta \approx -107.415°$ (angle)

13.1701

b)

- (sqrt(5) - 1) log(8 + (1 - sqrt(5))*2+ 2) - (sqrt(5) - 1) log(8 + (sqrt(5) - 1)*2 + 2) + (1 + sqrt(5)) log(8 + (1 + sqrt(5))*2 + 2)

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

$$-\left(\sqrt{5}-1\right)\log\left(10+2\left(1-\sqrt{5}\right)\right)-\left(\sqrt{5}-1\right)\log\left(10+2\left(\sqrt{5}-1\right)\right)+\left(1+\sqrt{5}\right)\log\left(10+2\left(1+\sqrt{5}\right)\right)$$

3.452040581111875270859068819714559114804957185053154150551...

3.452040581...

c)

- 12 log(-1) + 4 log(3) + 2 sqrt(10 - 2 sqrt(5)) tan^(-1)((-8 + sqrt(5) + 1)/sqrt(10 - 2 sqrt(5))) + 2 sqrt(2 (5 + sqrt(5))) tan^(-1)((8 - sqrt(5) + 1)/sqrt(2 (5 + sqrt(5))))

$$-12\log(-1)+4\log(3)+2\sqrt{10-2\sqrt{5}}\,\tan^{-1}\left(\frac{-8+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+2\sqrt{2\left(5+\sqrt{5}\right)}\,\tan^{-1}\left(\frac{8-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)$$

$$-12\,i\,\pi+4\log(3)+2\sqrt{10-2\sqrt{5}}\,\tan^{-1}\left(\frac{\sqrt{5}-7}{\sqrt{10-2\sqrt{5}}}\right)+2\sqrt{2\left(5+\sqrt{5}\right)}\,\tan^{-1}\left(\frac{9-\sqrt{5}}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)$$

(result in radians)

7.21717284178781349901818172918281695482839113281501969193... - 37.6991118430775188615517205993540346103660327925012698516... i

(result in radians)

$r \approx 38.3837$ (radius), $\theta \approx -79.1623°$ (angle)

38.3837

d)

- 2 sqrt(2 (5 + sqrt(5))) tan^(-1)((8+ sqrt(5) - 1)/sqrt(2 (5 + sqrt(5)))) + 2 sqrt(10 - 2 sqrt(5)) tan^(-1)((8+ sqrt(5) + 1)/sqrt(10 - 2 sqrt(5)))

$$-2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{8+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{8+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)$$

$$2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{9+\sqrt{5}}{\sqrt{10-2\sqrt{5}}}\right)-2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{7+\sqrt{5}}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)$$

(result in radians)

−2.56223886262039834557339289027171407738727835210221986001...

(result in radians)

-2.562238862…

e)

4 sqrt(2) tan^(-1)(1 - sqrt(2) *2) - 4 sqrt(2) tan^(-1)(sqrt(2) *2+ 1)

$$4\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\times 2\right)-4\sqrt{2}\tan^{-1}\left(\sqrt{2}\times 2+1\right)$$

$$4\sqrt{2}\tan^{-1}\left(1-2\sqrt{2}\right)-4\sqrt{2}\tan^{-1}\left(1+2\sqrt{2}\right)$$

(result in radians)

−13.4951229807907334893190893660401176478898557291179671568...

(result in radians)

-13.49512298...

Thence, the final result of integral is the following:

1/8(13.1701+3.452040581+38.3837-2.562238862-13.49512298)

Input interpretation:

$$\frac{1}{8}(13.1701+3.452040581+38.3837-2.562238862-13.49512298)$$

Result:

4.868559842375

4.868559842375

From:

$$\int\left(\frac{x}{1-x^2}+\frac{2x^2}{1-x^4}+\frac{4x^4}{1-x^8}+\frac{5x^5}{1-x^{10}}\right)dx =$$

$$\frac{1}{8}\Bigg(-4\log(1-x^2)+2\sqrt{2}\log\left(x^2-\sqrt{2}\,x+1\right)-2\sqrt{2}\log\left(x^2+\sqrt{2}\,x+1\right)+$$
$$\left(1+\sqrt{5}\right)\log\left(2x^2+\left(-1-\sqrt{5}\right)x+2\right)-\left(\sqrt{5}-1\right)\log\left(2x^2+\left(1-\sqrt{5}\right)x+2\right)-$$
$$\left(\sqrt{5}-1\right)\log\left(2x^2+\left(\sqrt{5}-1\right)x+2\right)+\left(1+\sqrt{5}\right)\log\left(2x^2+\left(1+\sqrt{5}\right)x+2\right)-$$
$$12\log(1-x)+4\log(x+1)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+$$
$$2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x-\sqrt{5}+1}{\sqrt{2(5+\sqrt{5})}}\right)-2\sqrt{2\left(5+\sqrt{5}\right)}$$
$$\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2(5+\sqrt{5})}}\right)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+$$
$$4\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\,x\right)-4\sqrt{2}\tan^{-1}\left(\sqrt{2}\,x+1\right)\Bigg)+\text{constant}$$

(assuming a complex-valued logarithm)

Multiplying by 1/3 all the integral, we obtain:

1/3*[integral(x/(1 - x^2) + (2 x^2)/(1 - x^4) + (4 x^4)/(1 - x^8) + (5 x^5)/(1 - x^10))] dx =

1/24 [(-4 log(1 - x^2) + 2 sqrt(2) log(x^2 - sqrt(2) x + 1) - 2 sqrt(2) log(x^2 + sqrt(2) x + 1) + (1 + sqrt(5)) log(2 x^2 + (-1 - sqrt(5)) x + 2) - (sqrt(5) - 1) log(2 x^2 + (1 - sqrt(5)) x + 2) - (sqrt(5) - 1) log(2 x^2 + (sqrt(5) - 1) x + 2) + (1 + sqrt(5)) log(2 x^2 + (1 + sqrt(5)) x + 2) - 12 log(1 - x) + 4 log(x + 1) + 2 sqrt(10 - 2 sqrt(5)) tan^(-1)((-4 x + sqrt(5) + 1)/sqrt(10 - 2 sqrt(5))) + 2 sqrt(2 (5 + sqrt(5))) tan^(-1)((4 x - sqrt(5) + 1)/sqrt(2 (5 + sqrt(5)))) - 2 sqrt(2 (5 + sqrt(5))) tan^(-1)((4 x + sqrt(5) - 1)/sqrt(2 (5 + sqrt(5)))) + 2 sqrt(10 - 2 sqrt(5)) tan^(-1)((4 x + sqrt(5) + 1)/sqrt(10 - 2 sqrt(5))) + 4 sqrt(2) tan^(-1)(1 - sqrt(2) x) - 4 sqrt(2) tan^(-1)(sqrt(2) x + 1))]

Indefinite integral:

$$\frac{1}{3}\int\left(\frac{x}{1-x^2}+\frac{2x^2}{1-x^4}+\frac{4x^4}{1-x^8}+\frac{5x^5}{1-x^{10}}\right)dx =$$

$$\frac{1}{24}\Bigg(-4\log(1-x^2)+2\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-$$
$$2\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-\left(\sqrt{5}-1\right)\log\left(x^2-\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)-$$
$$\left(\sqrt{5}-1\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)+\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+$$
$$\left(1+\sqrt{5}\right)\log\left(\frac{1}{2}\left(2x^2+\sqrt{5}x+x+2\right)\right)-12\log(1-x)+$$
$$4\log(x+1)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+$$
$$2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x-\sqrt{5}+1}{\sqrt{2(5+\sqrt{5})}}\right)-2\sqrt{2\left(5+\sqrt{5}\right)}$$
$$\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2(5+\sqrt{5})}}\right)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+$$
$$4\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)-4\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\Bigg)+\text{constant}$$

(assuming a complex-valued logarithm)

1/24(13.1701+3.452040581+38.3837-2.562238862-13.49512298)

Input interpretation:

$$\frac{1}{24}(13.1701+3.452040581+38.3837-2.562238862-13.49512298)$$

Result:

1.622853280791666666666666666666666666666666666666666...

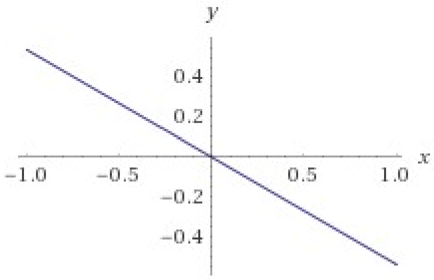
1.622853280791666666...

1/3*integral(2/(1 - 2^2) + (2*2^2)/(1 - 2^4) + (4*2^4)/(1 - 2^8) + (5*2^5)/(1 - 2^10))dx

Indefinite integral:

$$\frac{1}{3}\int\left(\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}\right)dx = -\frac{3106\,x}{5797} + \text{constant}$$

Plot:



(x from -1 to 1)

For x = 2 and constant = 0.551264527988492

Input interpretation:

$$\frac{3106\times 2}{5797} + 0.551264527988492$$

Result:

1.622853280791666055545972054510953941693979644643781266172...

1.622853280791666….

Or:

(3106*2)/5797 +0.551285598

Where 0.551285598 is the mathematical constant concerning the vertex solid angle

Input interpretation:

$$\frac{3106\times 2}{5797} + 0.551285598$$

Result:

1.622874350803174055545972054510953941693979644643781266172...

1.622874350803....

We have that:

x/(1-x^2)+(2x^2)/(1-x^4)+(4x^4)/(1-x^8)+(5x^5)/(1-x^10)...

for x = 2, we obtain:

2/(1-2^2)+(2*2^2)/(1-2^4)+(4*2^4)/(1-2^8)+(5*2^5)/(1-2^10)

Input:

$$\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}$$

Exact result:

$$-\frac{9318}{5797}$$

Decimal approximation:

-1.60738312920476108331895808176643091254096946696567189925...

-1.6073831292....

-1/(((2/(1-2^2)+(2*2^2)/(1-2^4)+(4*2^4)/(1-2^8)+(5*2^5)/(1-2^10))))

Input:

$$-\frac{1}{\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}$$

Exact result:

$$\frac{5797}{9318}$$

Decimal approximation:

0.622129212277312728053230306932818201330757673320455033268...

0.622129212...

(((-1/(((2/(1-2^2)+(2*2^2)/(1-2^4)+(4*2^4)/(1-2^8)+(5*2^5)/(1-2^10)))))))^1/64

Input:

$$\sqrt[64]{-\frac{1}{\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}}$$

Result:

$$\sqrt[64]{\frac{5797}{9318}}$$

Decimal approximation:

0.9926116870343508974018481084832317126896574153512718700650...

0.992611687… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate form:

$$\frac{\sqrt[64]{5797}\ 9318^{63/64}}{9318}$$

2*log base 0.99261168703435 (((-1/(((2/(1-2^2)+(2*2^2)/(1-2^4)+(4*2^4)/(1-2^8)+(5*2^5)/(1-2^10)))))))+11+1/golden ratio

Input interpretation:

$$2\log_{0.99261168703435}\left(-\frac{1}{\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.618033989...

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

Alternative representation:

$$2\log_{0.992611687034350000}\left(-\frac{1}{\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\frac{2\log\left(-\frac{1}{-\frac{2}{3}+\frac{8}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}\right)}{\log(0.992611687034350000)}$$

Series representations:

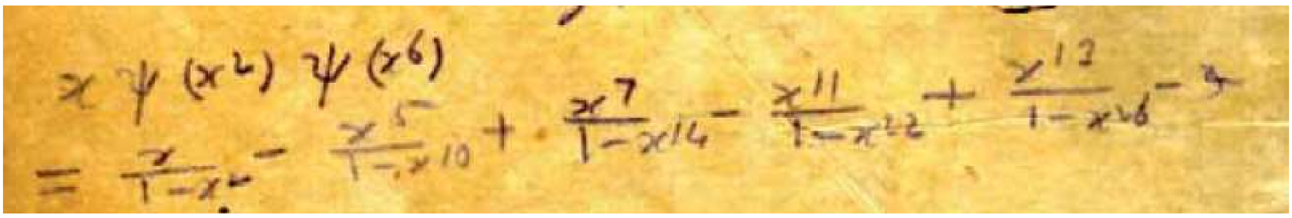
$$2\log_{0.992611687034350000}\left(-\frac{1}{\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{3521}{9318}\right)^k}{k}}{\log(0.992611687034350000)}$$

$$2\log_{0.992611687034350000}\left(-\frac{1}{\frac{2}{1-2^2}+\frac{2\times 2^2}{1-2^4}+\frac{4\times 2^4}{1-2^8}+\frac{5\times 2^5}{1-2^{10}}}\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-269.6977911328972\log\left(\frac{5797}{9318}\right)-2\log\left(\frac{5797}{9318}\right)\sum_{k=0}^{\infty}(-0.007388312965650000)^k\,G(k)$$

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



For x = 2, we obtain:

2/(1-2^2)-2^5/(1-2^10)+2^7/(1-2^14)-2^11/(1-2^22)+2^13/(1-2^26)

Input:

$$\frac{2}{1-2^2} - \frac{2^5}{1-2^{10}} + \frac{2^7}{1-2^{14}} - \frac{2^{11}}{1-2^{22}} + \frac{2^{13}}{1-2^{26}}$$

Exact result:

$$-\frac{112\,316\,372\,440\,473\,074\,242}{174\,720\,950\,108\,243\,807\,763}$$

Decimal approximation:

−0.64283288507125444891761669607510143990132564600064508054...

-0.64283288507125…

Alternate form:

$$-\frac{112\,316\,372\,440\,473\,074\,242}{174\,720\,950\,108\,243\,807\,763}$$

(((-2/(1-2^2)-2^5/(1-2^10)+2^7/(1-2^14)-2^11/(1-2^22)+2^13/(1-2^26)))^1/32

Input:

$$\sqrt[32]{-\frac{2}{1-2^2} - \frac{2^5}{1-2^{10}} + \frac{2^7}{1-2^{14}} - \frac{2^{11}}{1-2^{22}} + \frac{2^{13}}{1-2^{26}}}$$

Result:

$$\sqrt[32]{\frac{40\,214\,964\,790\,172\,889\,814}{58\,240\,316\,702\,747\,935\,921}}$$

Decimal approximation:

0.988493627498942626382411128459586468294061421849699448776...

0.988493627… result practically equal to the dilaton value **0.989117352243** = $\boldsymbol{\phi}$

Alternate form:

$$\frac{\sqrt[32]{40\,214\,964\,790\,172\,889\,814\ 58\,240\,316\,702\,747\,935\,921^{31/32}}}{58\,240\,316\,702\,747\,935\,921}$$

4*log base 0.988493627((((-2/(1-2^2)-2^5/(1-2^10)+2^7/(1-2^14)-2^11/(1-2^22)+2^13/(1-2^26)))))+11+1/golden ratio

Input interpretation:

$$4 \log_{0.988493627}\left(-\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.6180...

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

Alternative representation:

$$4 \log_{0.988494}\left(-\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}+\frac{4 \log\left(\frac{-2}{-3}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)}{\log(0.988494)}$$

Series representations:

$$4 \log_{0.988494}\left(-\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-\frac{4 \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{18025351912575046107}{58240316702747935921}\right)^k}{k}}{\log(0.988494)}$$

$$4 \log_{0.988494}\left(-\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}-345.633 \log\left(\frac{40214964790172889814}{58240316702747935921}\right)-4 \log\left(\frac{40214964790172889814}{58240316702747935921}\right) \sum_{k=0}^{\infty} (-0.0115064)^k G(k)$$

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

-((-1+2/(1-2^2)-2^5/(1-2^10)+2^7/(1-2^14)-2^11/(1-2^22)+2^13/(1-2^26)))

Input:

$$-\left(-1+\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)$$

Exact result:

$$\frac{287037322548716882005}{174720950108243807763}$$

Decimal approximation:

1.642832885071254448917616696075101439901325646000645080543...

1.64283288507… ≈ $\zeta(2) = \frac{\pi^2}{6}$ = 1.644934 ...

Alternate form:

$$\frac{287037322548716882005}{174720950108243807763}$$

-24*1/10^3 -((-1+2/(1-2^2)-2^5/(1-2^10)+2^7/(1-2^14)-2^11/(1-2^22)+2^13/(1-2^26)))

where 24 corresponding to the physical vibrations of a bosonic string.

Input:

$$-24\times\frac{1}{10^3}-\left(-1+\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)$$

Exact result:

$$\frac{35355502468264878827336}{21840118763530475970375}$$

Decimal approximation:

1.618832885071254448917616696075101439901325646000645080543...

1.61883288507… result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternate form:

$$\frac{35355502468264878827336}{21840118763530475970375}$$

-1*1/10^27*(((-29*1/10^3 +((-1+2/(1-2^2)-2^5/(1-2^10)+2^7/(1-2^14)-2^11/(1-2^22)+2^13/(1-2^26))))))

Where 29 is a Lucas number

Input:

$$-\frac{1}{10^{27}}\left(-29\times\frac{1}{10^3}+\left(-1+\frac{2}{1-2^2}-\frac{2^5}{1-2^{10}}+\frac{2^7}{1-2^{14}}-\frac{2^{11}}{1-2^{22}}+\frac{2^{13}}{1-2^{26}}\right)\right)$$

Exact result:

$$\frac{292104230101855952430127}{174720950108243807763000000000000000000000000000}$$

Decimal approximation:

$1.671832885071254448917616696075101439901325646000645... \times 10^{-27}$

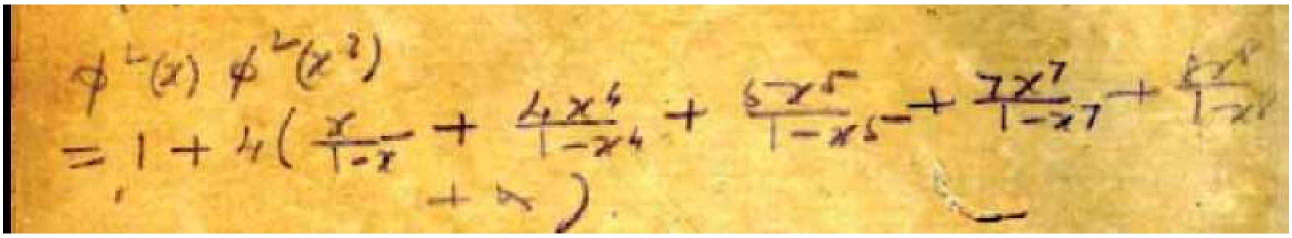
$1.67183288507…*10^{-27}$ result practically equal to the value of the formula:

$$m_{p'} = 2\times\frac{\eta}{R}m_P = 1.6714213\times10^{-27}\text{ kg}$$

that is the holographic proton mass (N. Haramein)

Alternate form:

$$\frac{292104230101855952430127}{174720950108243807763000000000000000000000000000}$$



For x = 2, we obtain:

1+4(2/(1-2)+(4*2^4)/(1-2^4)+(5*2^5)/(1-2^5)+(7*2^7)/(1-2^7)+(8*2^8)/(1-2^8))

Input:

$$1+4\left(\frac{2}{1-2}+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)$$

Exact result:

$$-\frac{105\,471\,193}{1\,003\,935}$$

Decimal approximation:

−105.05779059401256057414075612464950420096918625209799 4392...

-105.057790594...

-((1+4(2/(1-2)+(4*2^4)/(1-2^4)+(5*2^5)/(1-2^5)+(7*2^7)/(1-2^7)+(8*2^8)/(1-2^8))))+34+1/golden ratio

Input:

$$-\left(1+4\left(\frac{2}{1-2}+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)\right)+34+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{1}{\phi}+\frac{139\,604\,983}{1\,003\,935}$$

Decimal approximation:

139.67582458276245542234534295901514231868949543190375 72542...

139.6758245827… result practically equal to the rest mass of Pion meson 139.57

Alternate forms:

$$\frac{278\,206\,031 + 1\,003\,935\sqrt{5}}{2\,007\,870}$$

$$\frac{139\,604\,983\,\phi + 1\,003\,935}{1\,003\,935\,\phi}$$

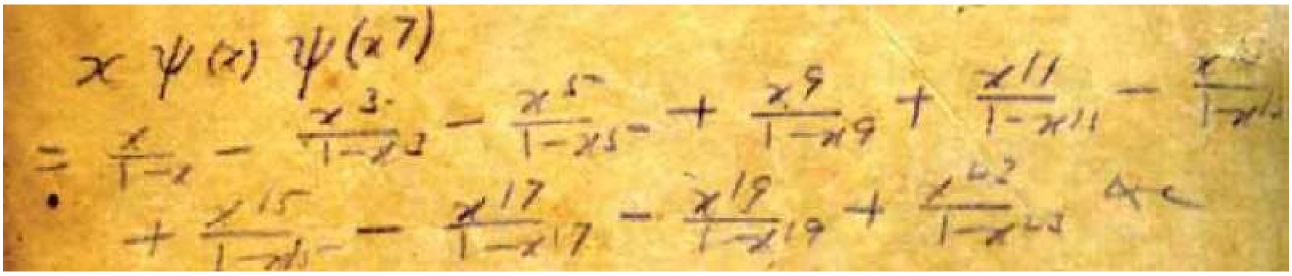
$$\frac{\sqrt{5}}{2} + \frac{278\,206\,031}{2\,007\,870}$$

Alternative representations:

$$-\left(1+4\left(\frac{2}{1-2}+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)\right)+34+\frac{1}{\phi} = 33-4\left(-2+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)+\frac{1}{2\sin(54\,°)}$$

$$-\left(1+4\left(\frac{2}{1-2}+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)\right)+34+\frac{1}{\phi} = 33+-\frac{1}{2\cos(216\,°)}-4\left(-2+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)$$

$$-\left(1+4\left(\frac{2}{1-2}+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)\right)+34+\frac{1}{\phi} = 33-4\left(-2+\frac{4\times 2^4}{1-2^4}+\frac{5\times 2^5}{1-2^5}+\frac{7\times 2^7}{1-2^7}+\frac{8\times 2^8}{1-2^8}\right)+-\frac{1}{2\sin(666\,°)}$$



For x = 2, we obtain:

2/(1-2)-2^3/(1-2^3)-2^5/(1-2^5)+2^9/(1-2^9)+2^11/(1-2^11)- 2^13/(1-2^13)+2^15/(1-2^15)- 2^17/(1-2^17)-2^19/(1-2^19)+ 2^23/(1-2^23)

Input:

$$\frac{2}{1-2} - \frac{2^3}{1-2^3} - \frac{2^5}{1-2^5} + \frac{2^9}{1-2^9} + \frac{2^{11}}{1-2^{11}} - \frac{2^{13}}{1-2^{13}} + \frac{2^{15}}{1-2^{15}} - \frac{2^{17}}{1-2^{17}} - \frac{2^{19}}{1-2^{19}} + \frac{2^{23}}{1-2^{23}}$$

Exact result:

$$-\frac{2\,732\,169\,985\,131\,547\,176\,255\,351\,845\,238}{3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239}$$

Decimal approximation:

−0.827229275272495219912894463562442696991223434021306833 24...

-0.82722927527…

Alternate form:

$$-\frac{2\,732\,169\,985\,131\,547\,176\,255\,351\,845\,238}{3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239}$$

1/10^27 * (((18*1/10^3)+(((-2*[2/(1-2)-2^3/(1-2^3)-2^5/(1-2^5)+2^9/(1-2^9)+2^11/(1-2^11)- 2^13/(1-2^13)+2^15/(1-2^15)- 2^17/(1-2^17)-2^19/(1-2^19)+ 2^23/(1-2^23)])))))

Where 18 is a Lucas number

Input:

$$\frac{1}{10^{27}}\left(18\times\frac{1}{10^3} - 2\left(\frac{2}{1-2} - \frac{2^3}{1-2^3} - \frac{2^5}{1-2^5} + \frac{2^9}{1-2^9} + \frac{2^{11}}{1-2^{11}} - \frac{2^{13}}{1-2^{13}} + \frac{2^{15}}{1-2^{15}} - \frac{2^{17}}{1-2^{17}} - \frac{2^{19}}{1-2^{19}} + \frac{2^{23}}{1-2^{23}}\right)\right)$$

Exact result:

$$\frac{2\,761\,895\,153\,958\,634\,392\,396\,019\,884\,896\,151}{1\,651\,398\,268\,171\,512\,007\,814\,891\,092\,119\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Decimal approximation:

$1.6724585505449904398257889271248853939824468680426136... \times 10^{-27}$

$1.67245855054…*10^{-27}$ result practically equal to the proton mass

Alternate form:

$$\frac{2\,761\,895\,153\,958\,634\,392\,396\,019\,884\,896\,151}{1\,651\,398\,268\,171\,512\,007\,814\,891\,092\,119\,500\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

(((2/(1-2)-2^3/(1-2^3)-2^5/(1-2^5)+2^9/(1-2^9)+2^11/(1-2^11)- 2^13/(1-2^13)+2^15/(1-2^15)- 2^17/(1-2^17)-2^19/(1-2^19)+ 2^23/(1-2^23))))^1/16

Input:

$$\left(\frac{2}{1-2}-\frac{2^3}{1-2^3}-\frac{2^5}{1-2^5}+\frac{2^9}{1-2^9}+\frac{2^{11}}{1-2^{11}}-\frac{2^{13}}{1-2^{13}}+\frac{2^{15}}{1-2^{15}}-\frac{2^{17}}{1-2^{17}}-\frac{2^{19}}{1-2^{19}}+\frac{2^{23}}{1-2^{23}}\right)\text{^}(1/16)$$

Result:

$$\sqrt[16]{-\frac{2\,732\,169\,985\,131\,547\,176\,255\,351\,845\,238}{3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239}}$$

Decimal approximation:

0.9692271203553046862859404477016671826637481027876856 7320... + 0.1927912610384423729140909807097952570681618345659137 2135... i

Polar coordinates:

$r \approx 0.988215$ (radius), $\theta \approx 11.25°$ (angle)

0.988215 result practically equal to the dilaton value **0.989117352243 = ϕ**

Alternate forms:

$$\left(\sqrt[16]{-2\,732\,169\,985\,131\,547\,176\,255\,351\,845\,238}\ 3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239^{15/16}\right)/3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239$$

$$\sqrt[16]{\frac{2\,732\,169\,985\,131\,547\,176\,255\,351\,845\,238}{3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239}}\cos\left(\frac{\pi}{16}\right)+i\sqrt[16]{\frac{2\,732\,169\,985\,131\,547\,176\,255\,351\,845\,238}{3\,302\,796\,536\,343\,024\,015\,629\,782\,184\,239}}\sin\left(\frac{\pi}{16}\right)$$

8*log base 0.988215 -(((((2/(1-2)-2^3/(1-2^3)-2^5/(1-2^5)+2^9/(1-2^9)+2^11/(1-2^11)- 2^13/(1-2^13)+2^15/(1-2^15)- 2^17/(1-2^17)-2^19/(1-2^19)+ 2^23/(1-2^23))))))+11+1/golden ratio

Input interpretation:

$$8\log_{0.988215}\left(-\left(\frac{2}{1-2}-\frac{2^3}{1-2^3}-\frac{2^5}{1-2^5}+\frac{2^9}{1-2^9}+\frac{2^{11}}{1-2^{11}}-\frac{2^{13}}{1-2^{13}}+\frac{2^{15}}{1-2^{15}}-\frac{2^{17}}{1-2^{17}}-\frac{2^{19}}{1-2^{19}}+\frac{2^{23}}{1-2^{23}}\right)\right)+11+\frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.614...

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

Alternative representation:

$$8\log_{0.988215}\left(-\left(\frac{2}{1-2}-\frac{2^3}{1-2^3}-\frac{2^5}{1-2^5}+\frac{2^9}{1-2^9}+\frac{2^{11}}{1-2^{11}}-\frac{2^{13}}{1-2^{13}}+\frac{2^{15}}{1-2^{15}}-\frac{2^{17}}{1-2^{17}}-\frac{2^{19}}{1-2^{19}}+\frac{2^{23}}{1-2^{23}}\right)\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}+\frac{8\log\left(2+-\frac{8}{7}+\frac{2^5}{1-2^5}-\frac{2^9}{1-2^9}-\frac{2^{11}}{1-2^{11}}+\frac{2^{13}}{1-2^{13}}-\frac{2^{15}}{1-2^{15}}+\frac{2^{17}}{1-2^{17}}+\frac{2^{19}}{1-2^{19}}-\frac{2^{23}}{1-2^{23}}\right)}{\log(0.988215)}$$

Series representations:

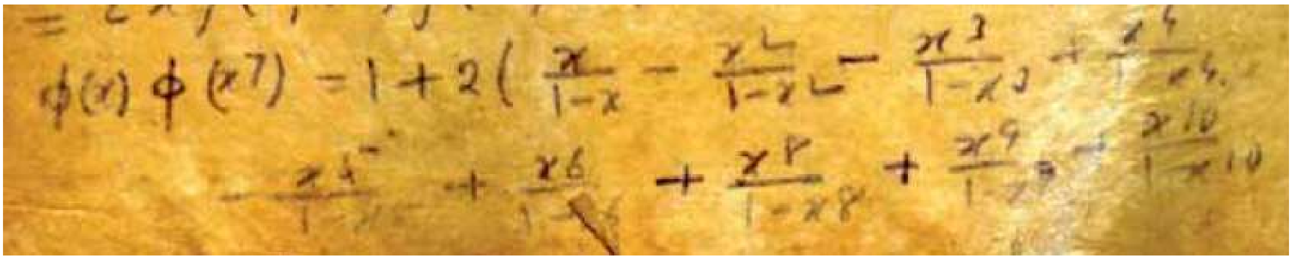
$$8\log_{0.988215}\left(-\left(\frac{2}{1-2}-\frac{2^3}{1-2^3}-\frac{2^5}{1-2^5}+\frac{2^9}{1-2^9}+\frac{2^{11}}{1-2^{11}}-\frac{2^{13}}{1-2^{13}}+\frac{2^{15}}{1-2^{15}}-\frac{2^{17}}{1-2^{17}}-\frac{2^{19}}{1-2^{19}}+\frac{2^{23}}{1-2^{23}}\right)\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-\frac{8\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{570626551211476839374430339001}{3302796536343024015629782184239}\right)^k}{k}}{\log(0.988215)}$$

$$8\log_{0.988215}\left(-\left(\frac{2}{1-2}-\frac{2^3}{1-2^3}-\frac{2^5}{1-2^5}+\frac{2^9}{1-2^9}+\frac{2^{11}}{1-2^{11}}-\frac{2^{13}}{1-2^{13}}+\frac{2^{15}}{1-2^{15}}-\frac{2^{17}}{1-2^{17}}-\frac{2^{19}}{1-2^{19}}+\frac{2^{23}}{1-2^{23}}\right)\right)+11+\frac{1}{\phi}=$$

$$11+\frac{1}{\phi}-674.829\log\left(\frac{2732169985131547176255351845238}{3302796536343024015629782184239}\right)-8\log\left(\frac{2732169985131547176255351845238}{3302796536343024015629782184239}\right)\sum_{k=0}^{\infty}(-0.011785)^k\,G(k)$$

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



For x = 2, we obtain:

1+2(2/(1-2)-(2^2)/(1-4)-(2^3)/(1-8)+(2^4)/(1-16)-(2^5)/(1-32)+(2^6)/(1-64)+(2^8)/(1-256)+(2^9)/(1-512)+(2^10)/(1-1024))

Input:

$$1+2\left(\frac{2}{1-2}-\frac{2^2}{1-4}-\frac{2^3}{1-8}+\frac{2^4}{1-16}-\frac{2^5}{1-32}+\frac{2^6}{1-64}+\frac{2^8}{1-256}+\frac{2^9}{1-512}+\frac{2^{10}}{1-1024}\right)$$

Exact result:

$$-\frac{821392933}{133302015}$$

Decimal approximation:

−6.16189434945900855287146259567044054060248076520073608789...

-6.161894349459.....

-(18+4)((((1+2(2/(1-2)-(2^2)/(1-4)-(2^3)/(1-8)+(2^4)/(1-16)-(2^5)/(1-32)+(2^6)/(1-64)+(2^8)/(1-256)+(2^9)/(1-512)+(2^10)/(1-1024))))))+4

Input:

$$-(18+4)\left(1+2\left(\frac{2}{1-2}-\frac{2^2}{1-4}-\frac{2^3}{1-8}+\frac{2^4}{1-16}-\frac{2^5}{1-32}+\frac{2^6}{1-64}+\frac{2^8}{1-256}+\frac{2^9}{1-512}+\frac{2^{10}}{1-1024}\right)\right)+4$$

Exact result:

$$\frac{1691259326}{12118365}$$

Decimal approximation:

139.5616756880981881631721771047496918932545768344161939337...

139.561675688098..... result practically equal to the rest mass of Pion meson 139.57

From the results of above expression

-1.6073831292 -0.64283288507125 -105.057790594 -0.82722927527

-6.161894349459

we obtain:

-(-1+1/-1.6073831292 *1/ -0.64283288507125 *1/ -105.057790594 *1/ -0.82722927527 *1/ -6.161894349459)

Input interpretation:

$$-\left(-1+-\frac{1}{1.6073831292}\left(-\frac{1}{0.64283288507125}\right)\left(-\frac{1}{105.057790594}\right)\left(-\frac{1}{0.82722927527}\right)\left(-\frac{1}{6.161894349459}\right)\right)$$

Result:

1.001807232808681385922392462130095367937323337620356209257...

1.001807232808... result practically equal to the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{2\pi}{5}}}{\sqrt{\varphi\sqrt{5}-\varphi}}=1+\frac{e^{-2\pi}}{1+\frac{e^{-4\pi}}{1+\frac{e^{-6\pi}}{1+\frac{e^{-8\pi}}{1+\dots}}}}\approx 1.0018674362$$

http://www.bitman.name/math/article/102/109/

Note that:

1/[-(-1+1/-1.6073831292 *1/ -0.64283288507125 *1/ -105.057790594 *1/ -0.82722927527 *1/ -6.161894349459)]^6

Input interpretation:

$$1\Big/\left(-\left(-1+-\frac{1}{1.6073831292}\left(-\frac{1}{0.64283288507125}\right)\left(-\frac{1}{105.057790594}\right)\left(-\frac{1}{0.82722927527}\right)\left(-\frac{1}{6.161894349459}\right)\right)\right)^6$$

Result:

0.989224861841272302472237075291828264418396430748362794653...

0.9892248618... result practically equal to the dilaton value $\mathbf{0.989117352243 = \phi}$

21*1/log base 0.9892248618((1/[-(-1+1/-1.6073831292 *1/ -0.64283288507125 *1/ -105.057790594 *1/ -0.82722927527 *1/ -6.161894349459)]))-Pi+golden ratio^2

Where 21 is a Fibonacci number

Input interpretation:

$$21\times 1 / \log_{0.9892248618}\left(-\left(1/\left(-1+-\frac{1}{1.6073831292}\left(-\frac{1}{0.64283288507125}\right)\left(-\frac{1}{105.057790594}\right)\left(-\frac{1}{0.82722927527}\right)\left(-\frac{1}{6.161894349459}\right)\right)\right)\right)-\pi+\phi^2$$

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

ϕ is the golden ratio

Result:

125.47644...

125.47644… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18

Alternative representation:

$$21/\log_{0.989225}(-(1/(-1+-(1/(0.642832885071250000(-1.60738312920000)(-105.0577905940000)(-0.827229275270000(-6.16189434945900000))))))) - \pi+\phi^2 = -\pi+\phi^2+21 / \frac{1}{\log(0.989225)} \log\left(1/(1--(1/(105.0577905940000(-6.16189434945900000)(-1.60738312920000)(-0.827229275270000)(-0.642832885071250000))))\right)$$

Series representations:

$$21/\log_{0.989225}(-(1/(-1+-(1/(0.642832885071250000 (-1.60738312920000)(-105.0577905940000) (-0.827229275270000(-6.1618943494590000))))))) - \pi + \phi^2 = \phi^2 - \pi - \frac{21\log(0.989225)}{\sum_{k=1}^{\infty} \frac{(-1)^k (-0.00180397261019428)^k}{k}}$$

$$21/\log_{0.989225}(-(1/(-1+-(1/(0.642832885071250000(-1.60738312920000) (-105.0577905940000)(-0.827229275270000 (-6.1618943494590000))))))) - \pi + \phi^2 = \phi^2 - \pi - \frac{21}{\log(0.99819602738980572)\left(92.3062 + \sum_{k=0}^{\infty}(-0.0107751)^k G(k)\right)}$$

for

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

21*1/log base 0.9892248618((1/[-(-1+1/-1.6073831292 *1/ -0.64283288507125 *1/ -105.057790594 *1/ -0.82722927527 *1/ -6.161894349459)]))-5+18+1/golden ratio

Where 21 and 5 are Fibonacci numbers, while 18 is a Lucas number

Input interpretation:

$$21\times 1 \Big/ \log_{0.9892248618}\left(-\left(1\Big/\left(-1+-\frac{1}{1.6073831292}\left(-\frac{1}{0.64283288507125}\right)\left(-\frac{1}{105.057790594}\right)\left(-\frac{1}{0.82722927527}\right)\left(-\frac{1}{6.161894349459}\right)\right)\right)\right) - 5 + 18 + \frac{1}{\phi}$$

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

ϕ is the golden ratio

Result:

139.61803...

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

Alternative representation:

$$21/\log_{0.989225}(-(1/(-1+-(1/(0.642832885071250000(-1.60738312920000)(-105.0577905940000)(-0.827229275270000(-6.1618943494590000)))))))-5+18+\frac{1}{\phi}=13+\frac{1}{\phi}+21\Big/\frac{1}{\log(0.989225)}\log\left(1/(1--(1/(105.0577905940000(-6.1618943494590000)(-1.60738312920000)(-0.827229275270000)(-0.642832885071250000)))))\right)$$

Series representations:

$$21/\log_{0.989225}(-(1/(-1+-(1/(0.642832885071250000(-1.60738312920000)(-105.0577905940000)(-0.827229275270000(-6.1618943494590000)))))))-5+18+\frac{1}{\phi}=13+\frac{1}{\phi}-\frac{21\log(0.989225)}{\sum_{k=1}^{\infty}\frac{(-1)^k(-0.00180397261019428)^k}{k}}$$

$$21/\log_{0.989225}(-(1/(-1+-(1/(0.642832885071250000(-1.60738312920000)(-105.0577905940000)(-0.827229275270000(-6.1618943494590000)))))))-5+18+\frac{1}{\phi}=13+\frac{1}{\phi}-\frac{21}{\log(0.99819602738980572)\left(92.3062+\sum_{k=0}^{\infty}(-0.0107751)^k G(k)\right)}$$

for

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

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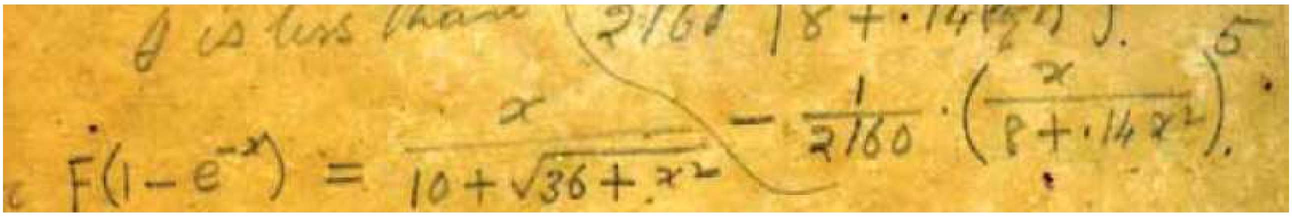


For x = 18, we obtain:

18/(10+sqrt(36+18^2)) – 1/2160 * (18/(8+14*18^3))^5

Input:

$$\frac{18}{10+\sqrt{36+18^2}}-\frac{1}{2160}\left(\frac{18}{8+14\times 18^3}\right)^5$$

Result:

$$\frac{18}{10+6\sqrt{10}}-\frac{2187}{9\,075\,708\,061\,687\,780\,786\,749\,440}$$

Decimal approximation:

0.621253797300711414830068653214948104631976939406456177439...

0.6212537973…

Alternate forms:

$$\frac{9\left(5\,445\,424\,837\,012\,668\,472\,049\,664\sqrt{10}-9\,075\,708\,061\,687\,780\,786\,752\,599\right)}{117\,984\,204\,801\,941\,150\,227\,742\,720}$$

$$\frac{27\sqrt{10}}{65}-\frac{81\,681\,372\,555\,190\,027\,080\,773\,391}{117\,984\,204\,801\,941\,150\,227\,742\,720}$$

$$\frac{49\,008\,823\,533\,114\,016\,248\,446\,976\sqrt{10}-81\,681\,372\,555\,190\,027\,080\,773\,391}{117\,984\,204\,801\,941\,150\,227\,742\,720}$$

Minimal polynomial:

$$1\,070\,790\,198\,672\,799\,474\,772\,222\,730\,814\,213\,662\,594\,057\,424\,076\,800\,x^2+1\,482\,632\,582\,777\,722\,349\,685\,132\,151\,731\,484\,146\,490\,560\,272\,302\,080\,x-1\,334\,369\,324\,499\,950\,114\,715\,797\,205\,614\,156\,009\,131\,066\,472\,446\,683$$

1/(((18/(10+sqrt(36+18^2)) – 1/2160 * (18/(8+14*18^3))^5)))

Input:

$$\frac{1}{\frac{18}{10+\sqrt{36+18^2}} - \frac{1}{2160}\left(\frac{18}{8+14\times 18^3}\right)^5}$$

Result:

$$\frac{1}{\frac{18}{10+6\sqrt{10}} - \frac{2187}{9075708061687780786749440}}$$

Decimal approximation:

1.609648108945015332889144423294764565669127214084266903221...

1.6096481089...

From which, we can to obtain:

(-x/9075708061687780786749440 + 18/(10 + 6 sqrt(10)))=0.621253797300711414830068653214948104631976939406456177439

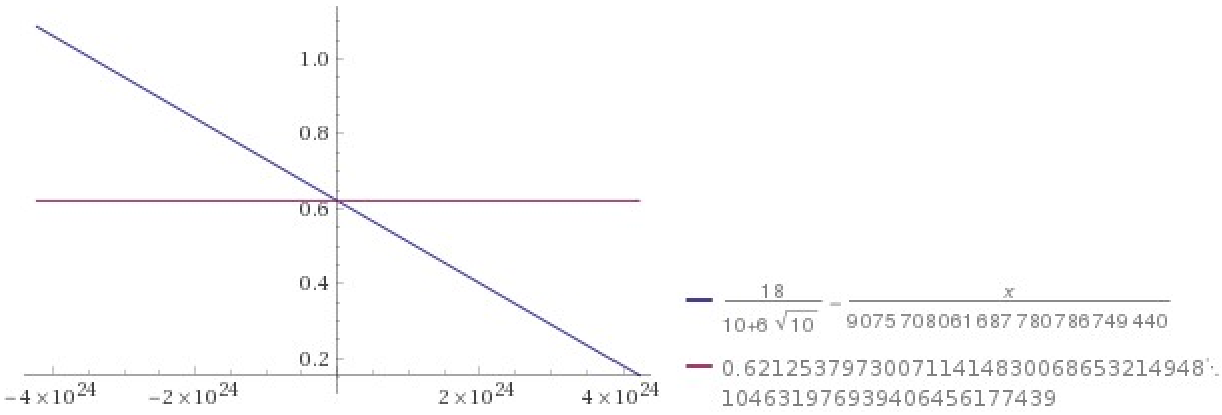
Input interpretation:

$$-\frac{x}{9075708061687780786749440} + \frac{18}{10+6\sqrt{10}} = 0.621253797300711414830068653214948104631976939406456177439$$

Result:

$$\frac{18}{10+6\sqrt{10}} - \frac{x}{9075708061687780786749440} = 0.621253797300711414830068653214948104631976939406456177439$$

Plot:



Alternate forms:

$$2.4097293402728629768442615940311987 1\times 10^{-22} - \frac{x}{9075708061687780786749440} = 0$$

$$\frac{1}{65}\left(27\sqrt{10} - 45\right) - \frac{x}{9075708061687780786749440} = 0.621253797300711414830068653214948104631976939406456177439$$

$$\frac{9}{5+3\sqrt{10}} - \frac{x}{9075708061687780786749440} = 0.621253797300711414830068653214948104631976939406456177439$$

Solution:

$x \approx 2187.0000000000000000000000000000001$

Integer solution:

$x = 2187$

2187

And:

(-(x+76)/9075708061687780786749440 + 18/(10 + 6 sqrt(10)))=0.621253797300711414830068653214948104631976939406456177439

Where 76 is a Lucas number

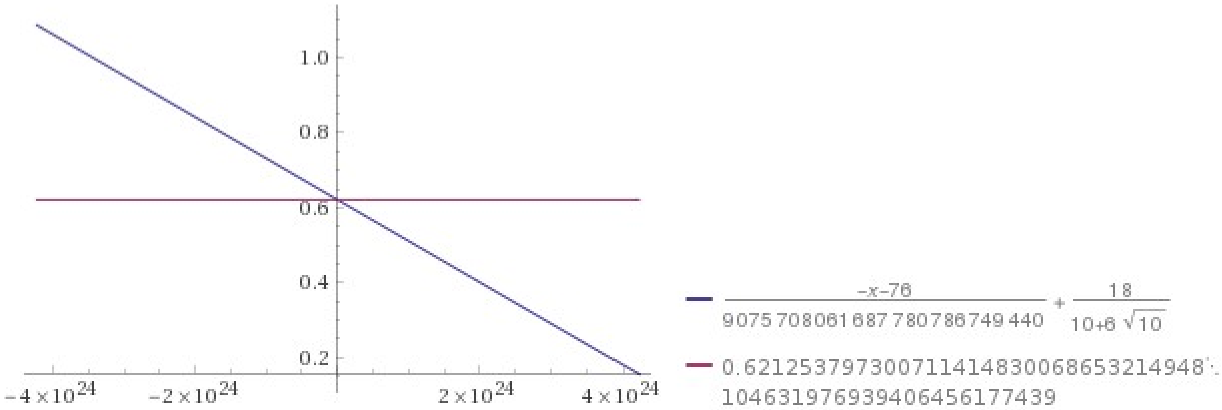
Input interpretation:

$$-\frac{x+76}{9075708061687780786749440} + \frac{18}{10+6\sqrt{10}} = 0.621253797300711414830068653214948104631976939406456177439$$

Result:

$$\frac{-x-76}{9075708061687780786749440} + \frac{18}{10+6\sqrt{10}} = 0.621253797300711414830068653214948104631976939406456177439$$

Plot:



Alternate forms:

$$2.32598931747417180801016745541831755\times 10^{-22} - \frac{x}{9075708061687780786749440} = 0$$

$$\frac{-x-76}{9075708061687780786749440} + \frac{1}{65}\left(27\sqrt{10} - 45\right) = 0.621253797300711414830068653214948104631976939406456177439$$

$$\frac{-x-76}{9075708061687780786749440} + \frac{9}{5+3\sqrt{10}} = 0.621253797300711414830068653214948104631976939406456177439$$

Expanded form:

$$-\frac{x}{9075708061687780786749440} + \frac{18}{10+6\sqrt{10}} - \frac{19}{2268927015421945196687360} = 0.621253797300711414830068653214948104631976939406456177439$$

Solution:

$x \approx 2111.00000000000000000000000000000001$

Integer solution:

$x = 2111$

2111 result very near to the rest mass of strange D meson 2112.3

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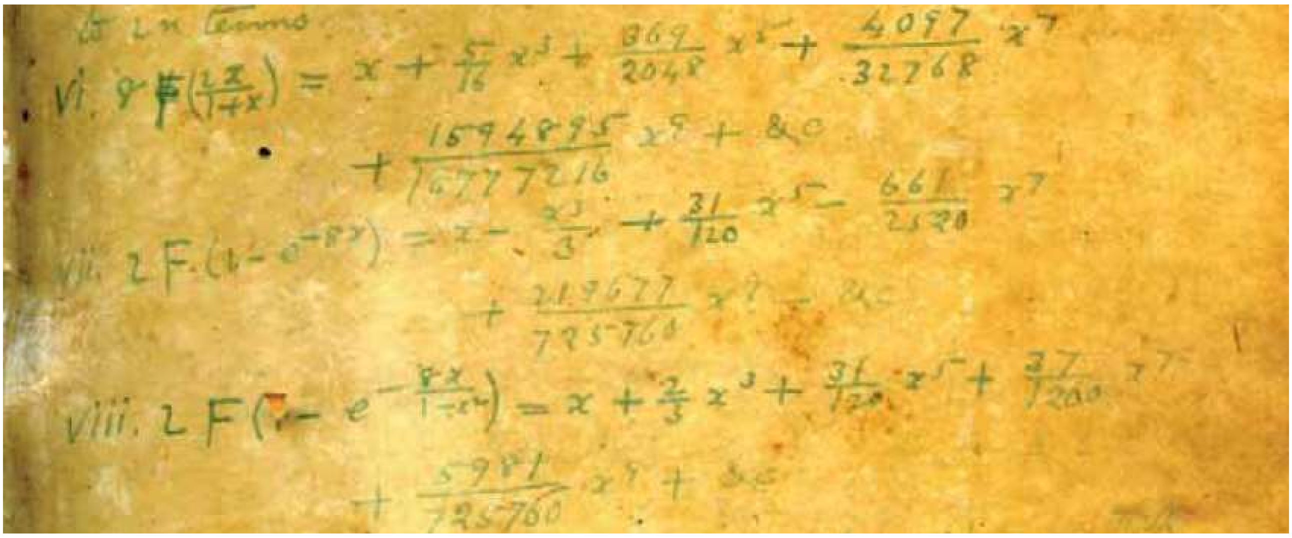

For x = 2, we obtain:

2+(5/16)*2^3+(369/2048)*2^5+(4097/32268)*2^7+(1594895/16777216)*2^9

Input:

$$2+\frac{5}{16}\times 2^3+\frac{369}{2048}\times 2^5+\frac{4097}{32\,268}\times 2^7+\frac{1\,594\,895}{16\,777\,216}\times 2^9$$

Exact result:

$$\frac{19\,875\,643\,565}{264\,339\,456}$$

Decimal approximation:

75.18984818142320758956241477624891533407710425189041775133...

75.18984818142320.....

2-(2^3)/3+(31/120)*2^5-(661/2520)*2^7+(219677/725760)*2^9

Input:

$$2-\frac{2^3}{3}+\frac{31}{120}\times 2^5-\frac{661}{2520}\times 2^7+\frac{219\,677}{725\,760}\times 2^9$$

Exact result:

$$\frac{365\,716}{2835}$$

Decimal approximation:

129.0003527336860670194003527336860670194003527336860670194...

129.000352733686067……

2+(2/3)*2^3+(31/120)*2^5+(37/1260)*2^7+(5981/725760)*2^9

Input:

$$2+\frac{2}{3}\times 2^3+\frac{31}{120}\times 2^5+\frac{37}{1260}\times 2^7+\frac{5981}{725760}\times 2^9$$

Exact result:

$$\frac{66844}{2835}$$

Decimal approximation:

23.578130511463844797178130511463844797178130511463844797 17...

23.5781305114638…… result very near to the black hole entropy 23.6954

(19875643565/264339456 + 365716/2835 + 66844/2835)-76-11-golden ratio

where 76 and 11 are Lucas number

Input:

$$\left(\frac{19875643565}{264339456}+\frac{365716}{2835}+\frac{66844}{2835}\right)-76-11-\phi$$

ϕ is the golden ratio

Result:

$$\frac{7032807964601}{49960157184}-\phi$$

Decimal approximation:

139.15029743782322455793631118703318903293527831723456670 57...

139.1502974 result practically equal to the rest mass of Pion meson 139.57

Alternate forms:

$$\frac{7007827886009-24980078592\sqrt{5}}{49960157184}$$

$$\frac{7032807964601-49960157184\,\phi}{49960157184}$$

$$\frac{7007827886009}{49960157184} - \frac{\sqrt{5}}{2}$$

Alternative representations:

$$\left(\frac{19875643565}{264339456} + \frac{365716}{2835} + \frac{66844}{2835}\right) - 76 - 11 - \phi = -87 + \frac{432560}{2835} + \frac{19875643565}{264339456} - 2\sin(54°)$$

$$\left(\frac{19875643565}{264339456} + \frac{365716}{2835} + \frac{66844}{2835}\right) - 76 - 11 - \phi = -87 + 2\cos(216°) + \frac{432560}{2835} + \frac{19875643565}{264339456}$$

$$\left(\frac{19875643565}{264339456} + \frac{365716}{2835} + \frac{66844}{2835}\right) - 76 - 11 - \phi = -87 + \frac{432560}{2835} + \frac{19875643565}{264339456} + 2\sin(666°)$$

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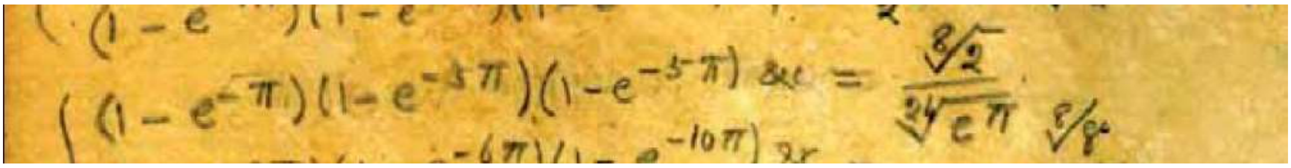


(1-e^(-Pi))(1-e^(-3Pi))(1-e^(-5Pi))

Input:

$$(1 - e^{-\pi})(1 - e^{-3\pi})(1 - e^{-5\pi})$$

Decimal approximation:

0.956708725383334259887083150002997516798687988267252736507...

0.9567087253…. result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 (see Appendix) and to the value of the following Rogers-Ramanujan continued fraction:

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

From:

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

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

We know that α' is the Regge slope (string tension). With regard the Omega mesons, the values are:

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

Property:
$(1-e^{-5\pi})(1-e^{-3\pi})(1-e^{-\pi})$ is a transcendental number

Alternate forms:
$(e^{-5\pi}-1)(e^{-3\pi}-1)(1-e^{-\pi})$

$(1-e^{-5\pi})(1-e^{-3\pi})(1+\sinh(\pi)-\cosh(\pi))$

$e^{-9\pi}(e^{\pi}-1)^3(1+e^{\pi}+e^{2\pi})(1+e^{\pi}+e^{2\pi}+e^{3\pi}+e^{4\pi})$

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

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

Alternative representations:

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = \left(1-e^{i\log(-1)}\right)\left(1-e^{3i\log(-1)}\right)\left(1-e^{5i\log(-1)}\right)$$

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = \left(1-e^{-900^\circ}\right)\left(1-e^{-540^\circ}\right)\left(1-e^{-180^\circ}\right)$$

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = \left(1-\exp^{-\pi}(z)\right)\left(1-\exp^{-3\pi}(z)\right)\left(1-\exp^{-5\pi}(z)\right) \quad \text{for } z=1$$

Series representations:

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = 1-e^{-36\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{-32\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{-24\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-e^{-20\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{-16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-e^{-12\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-e^{-4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}$$

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

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

Integral representations:

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = 1-e^{-36\int_0^1\sqrt{1-t^2}\,dt}+e^{-32\int_0^1\sqrt{1-t^2}\,dt}+e^{-24\int_0^1\sqrt{1-t^2}\,dt}-e^{-20\int_0^1\sqrt{1-t^2}\,dt}+e^{-16\int_0^1\sqrt{1-t^2}\,dt}-e^{-12\int_0^1\sqrt{1-t^2}\,dt}-e^{-4\int_0^1\sqrt{1-t^2}\,dt}$$

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = 1-e^{-24\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-64/3\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-16\int_0^{\infty}\sin^3(t)/t^3\,dt}-e^{-40/3\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-32/3\int_0^{\infty}\sin^3(t)/t^3\,dt}-e^{-8\int_0^{\infty}\sin^3(t)/t^3\,dt}-e^{-8/3\int_0^{\infty}\sin^3(t)/t^3\,dt}$$

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi}) = 1-\exp\left(-\frac{3\sqrt{3}}{4}-24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)+$$
$$\exp\left(-8\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)\right)-$$
$$\exp\left(-5\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)\right)-$$
$$\exp\left(-3\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)\right)-$$
$$\exp\left(-\frac{3\sqrt{3}}{4}-24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt-8\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)\right)+$$
$$\exp\left(-\frac{3\sqrt{3}}{4}-24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt-5\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)\right)+$$
$$\exp\left(-\frac{3\sqrt{3}}{4}-24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt-3\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{-(-1+t)t}\,dt\right)\right)$$

(((2)^1/8))/(((e^Pi)^1/24))

Input:

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}}$$

Exact result:

$$\sqrt[8]{2}\,e^{-\pi/24}$$

Decimal approximation:

0.956708725113587003449038717361890724715615702454393013400...

0.956708725… as above described

Property:

$\sqrt[8]{2}\,e^{-\pi/24}$ is a transcendental number

Alternative representations:

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \frac{\sqrt[8]{2}}{\sqrt[24]{e^{180\,°}}}$$

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \frac{\sqrt[8]{2}}{\sqrt[24]{\exp^{\pi}(z)}} \quad \text{for } z = 1$$

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \frac{\sqrt[8]{2}}{\sqrt[24]{e^{-i\log(-1)}}}$$

Series representations:

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \sqrt[8]{2}\, e^{-1/6 \sum_{k=0}^{\infty} (-1)^k/(1+2k)}$$

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \sqrt[8]{2} \left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{-\pi/24}$$

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \sqrt[8]{2} \left(\frac{1}{\sum_{k=0}^{\infty} \frac{(-1)^k}{k!}}\right)^{-\pi/24}$$

Integral representations:

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \sqrt[8]{2}\, e^{-1/6 \int_0^1 \sqrt{1-t^2}\, dt}$$

$$\frac{\sqrt[8]{2}}{\sqrt[24]{e^{\pi}}} = \sqrt[8]{2}\, e^{-1/12 \int_0^1 1/\sqrt{1-t^2}\, dt}$$

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

Thence:

$$\sqrt[8]{2}\, e^{-\pi/24}$$

0.956708725113587003449038717361890724715615702454393013400...

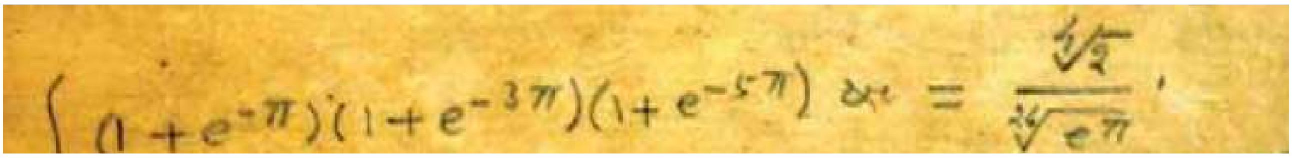
0.95670872511…..

$$(1-e^{-\pi})(1-e^{-3\pi})(1-e^{-5\pi})$$

0.9567087258383334259887083150002997516798687988267252736507...

0.95670872583…

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



(((2)^1/4))/(((e^Pi)^1/24))

Input:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{e^{\pi}}}$$

Exact result:

$$\sqrt[4]{2}\, e^{-\pi/24}$$

Decimal approximation:

1.043298262644687012527875688815591456103311209998752645741...

1.043298262644…..

Property:

$\sqrt[4]{2}\, e^{-\pi/24}$ is a transcendental number

Alternative representations:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{e^{\pi}}}=\frac{\sqrt[4]{2}}{\sqrt[24]{e^{180^{\circ}}}}$$

$$\frac{\sqrt[4]{2}}{\sqrt[24]{e^\pi}} = \frac{\sqrt[4]{2}}{\sqrt[24]{\exp^\pi(z)}} \quad \text{for } z = 1$$

$$\frac{\sqrt[4]{2}}{\sqrt[24]{e^\pi}} = \frac{\sqrt[4]{2}}{\sqrt[24]{e^{-i\log(-1)}}}$$

Series representations:

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

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

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

Integral representations:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{e^\pi}} = \sqrt[4]{2}\ e^{-1/6\int_0^1\sqrt{1-t^2}\,dt}$$

$$\frac{\sqrt[4]{2}}{\sqrt[24]{e^\pi}} = \sqrt[4]{2}\ e^{-1/12\int_0^1 1/\sqrt{1-t^2}\,dt}$$

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

(1+e^(-Pi))(1+e^(-3Pi))(1+e^(-5Pi))

Input:

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

Decimal approximation:

1.043298262350525543682520473748670633841480414792812410071...

1.04329826235…..

Property:

$(1+e^{-5\pi})(1+e^{-3\pi})(1+e^{-\pi})$ is a transcendental number

Alternate forms:

$$1+e^{-9\pi}+e^{-8\pi}+e^{-6\pi}+e^{-5\pi}+e^{-4\pi}+e^{-3\pi}+e^{-\pi}$$

$$e^{-9\pi}(1+e^{\pi})^3(1-e^{\pi}+e^{2\pi})(1-e^{\pi}+e^{2\pi}-e^{3\pi}+e^{4\pi})$$

$$e^{-9\pi}\left(1+e^{\pi}+e^{3\pi}+e^{4\pi}+e^{5\pi}+e^{6\pi}+e^{8\pi}+e^{9\pi}\right)$$

Alternative representations:

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})=\left(1+e^{i\log(-1)}\right)\left(1+e^{3i\log(-1)}\right)\left(1+e^{5i\log(-1)}\right)$$

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})=\left(1+e^{-900^\circ}\right)\left(1+e^{-540^\circ}\right)\left(1+e^{-180^\circ}\right)$$

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})=(1+\exp^{-\pi}(z))(1+\exp^{-3\pi}(z))(1+\exp^{-5\pi}(z)) \text{ for } z=1$$

Series representations:

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})= e^{-36\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\left(1+e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)^3\left(1-e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)\left(1-e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-e^{12\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)$$

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

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

Integral representations:

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi}) = \left(1+e^{-(3\sqrt{3})/4-24\int_0^{1/4}\sqrt{t-t^2}\,dt}\right) \left(1+e^{-5\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{t-t^2}\,dt\right)}\right) \left(1+e^{-3\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{t-t^2}\,dt\right)}\right)$$

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi}) = 1+e^{-24\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-64/3\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-16\int_0^{\infty}\sin^3(t)/t^3\,dt}+ e^{-40/3\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-32/3\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-8\int_0^{\infty}\sin^3(t)/t^3\,dt}+e^{-8/3\int_0^{\infty}\sin^3(t)/t^3\,dt}$$

$$(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi}) = e^{-18\int_0^{\infty}\sin(t)/t\,dt}\left(1+e^{2\int_0^{\infty}\sin(t)/t\,dt}\right)^3\left(1-e^{2\int_0^{\infty}\sin(t)/t\,dt}+e^{4\int_0^{\infty}\sin(t)/t\,dt}\right) \left(1-e^{2\int_0^{\infty}\sin(t)/t\,dt}+e^{4\int_0^{\infty}\sin(t)/t\,dt}-e^{6\int_0^{\infty}\sin(t)/t\,dt}+e^{8\int_0^{\infty}\sin(t)/t\,dt}\right)$$

From which, we obtain:

1/(((1+e^(-Pi))(1+e^(-3Pi))(1+e^(-5Pi))))

Input:

$$\frac{1}{(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})}$$

Decimal approximation:

0.95849867299407207440529454458015911029190412076885988463...

0.958498672994… result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 (see Appendix) and to the value of the following Rogers-Ramanujan continued fraction:

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

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We know that α' is the Regge slope (string tension). With regard the Omega mesons, the values are:

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

Property:

$$\frac{1}{(1+e^{-5\pi})(1+e^{-3\pi})(1+e^{-\pi})}$$ is a transcendental number

Alternate forms:

$$\frac{e^{9\pi}}{(1+e^{\pi})^3\left(1-e^{\pi}+e^{2\pi}\right)\left(1-e^{\pi}+e^{2\pi}-e^{3\pi}+e^{4\pi}\right)}$$

$$1-\frac{1}{15\,(1+e^{\pi})^3}+\frac{2}{5\,(1+e^{\pi})^2}-\frac{41}{45\,(1+e^{\pi})}+\frac{e^{\pi}-2}{9\left(1-e^{\pi}+e^{2\pi}\right)}+\frac{-1-e^{3\pi}}{5\left(1-e^{\pi}+e^{2\pi}-e^{3\pi}+e^{4\pi}\right)}$$

Alternative representations:

$$\frac{1}{(1+e^{-\pi})\left(1+e^{-3\pi}\right)\left(1+e^{-5\pi}\right)}=\frac{1}{\left(1+e^{-900^\circ}\right)\left(1+e^{-540^\circ}\right)\left(1+e^{-180^\circ}\right)}$$

$$\frac{1}{(1+e^{-\pi})\left(1+e^{-3\pi}\right)\left(1+e^{-5\pi}\right)}=\frac{1}{\left(1+e^{i\log(-1)}\right)\left(1+e^{3i\log(-1)}\right)\left(1+e^{5i\log(-1)}\right)}$$

$$\frac{1}{(1+e^{-\pi})\left(1+e^{-3\pi}\right)\left(1+e^{-5\pi}\right)}=\frac{1}{(1+\exp^{-\pi}(z))\left(1+\exp^{-3\pi}(z)\right)\left(1+\exp^{-5\pi}(z)\right)}\quad\text{for } z=1$$

Series representations:

$$\frac{1}{(1+e^{-\pi})\left(1+e^{-3\pi}\right)\left(1+e^{-5\pi}\right)}=e^{36\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\Big/\left(\left(1+e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)^3\left(1-e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)\left(1-e^{4\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{8\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-e^{12\sum_{k=0}^{\infty}(-1)^k/(1+2k)}+e^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)\right)$$

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

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

Integral representations:

$$\frac{1}{(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})} = \frac{1}{\left(1+e^{-15\int_0^{\infty}\sin^4(t)/t^4\,dt}\right)\left(1+e^{-9\int_0^{\infty}\sin^4(t)/t^4\,dt}\right)\left(1+e^{-3\int_0^{\infty}\sin^4(t)/t^4\,dt}\right)}$$

$$\frac{1}{(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})} = 1 \Bigg/ \left(\left(1+e^{-(3\sqrt{3})/4-24\int_0^{1/4}\sqrt{t-t^2}\,dt}\right)\left(1+e^{-5\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{t-t^2}\,dt\right)}\right)\left(1+e^{-3\left(\frac{3\sqrt{3}}{4}+24\int_0^{\frac{1}{4}}\sqrt{t-t^2}\,dt\right)}\right)\right)$$

$$\frac{1}{(1+e^{-\pi})(1+e^{-3\pi})(1+e^{-5\pi})} = e^{18\int_0^{\infty}\sin(t)/t\,dt} \Bigg/ \left(\left(1+e^{2\int_0^{\infty}\sin(t)/t\,dt}\right)^3 \left(1-e^{2\int_0^{\infty}\sin(t)/t\,dt}+e^{4\int_0^{\infty}\sin(t)/t\,dt}\right) \left(1-e^{2\int_0^{\infty}\sin(t)/t\,dt}+e^{4\int_0^{\infty}\sin(t)/t\,dt}-e^{6\int_0^{\infty}\sin(t)/t\,dt}+e^{8\int_0^{\infty}\sin(t)/t\,dt}\right)\right)$$

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