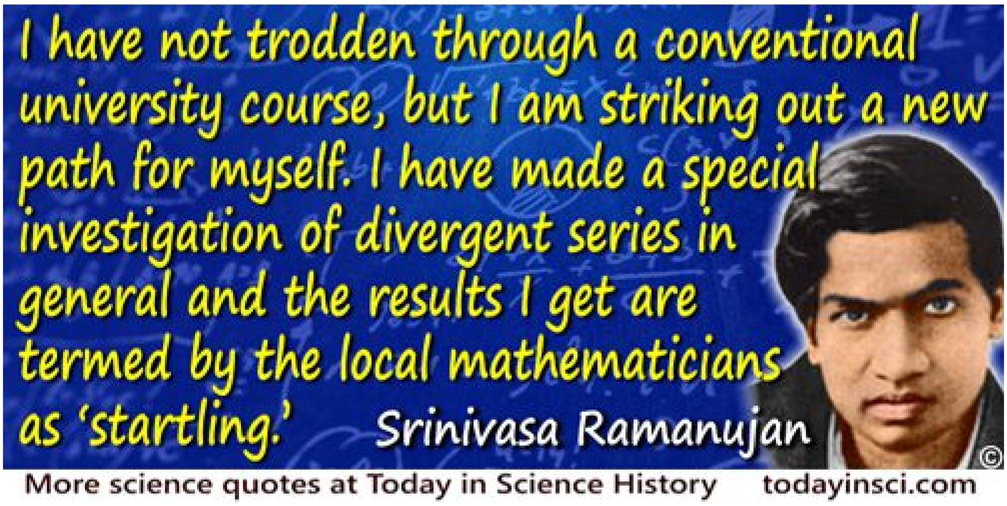
On some formulas of Manuscript Book 1 of Srinivasa Ramanujan: new possible mathematical connections with various parameters of Particle Physics and Cosmology part II.

Michele Nardelli[1], **Antonio Nardelli**

Abstract

In this research thesis, we have analyzed further formulas of Manuscript Book 1 of Srinivasa Ramanujan and described new possible mathematical connections with various parameters of Particle Physics and Cosmology (Cosmological Constant, some parameters of Dark Energy)

[1] M.Nardelli have studied by Dipartimento di Scienze della Terra Università degli Studi di Napoli Federico II, Largo S. Marcellino, 10 - 80138 Napoli, Dipartimento di Matematica ed Applicazioni "R. Caccioppoli" - Università degli Studi di Napoli "Federico II" – Polo delle Scienze e delle Tecnologie Monte S. Angelo, Via Cintia (Fuorigrotta), 80126 Napoli, Italy



https://todayinsci.com/R/Ramanujan_Srinivasa/RamanujanSrinivasa-Quotations.htm

Summary

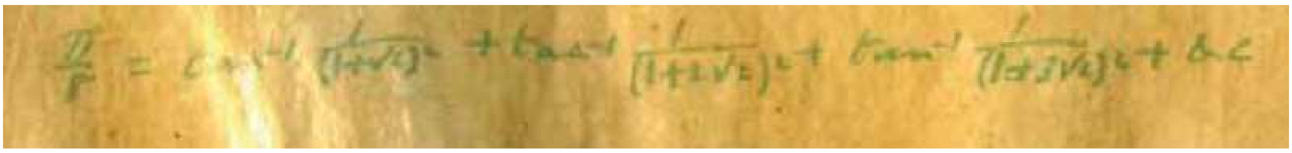
In this research thesis, we have analyzed the possible and new connections between different formulas of Manuscript Book 1 of Srinivasa Ramanujan and some parameters concerning Particle Physics and Cosmology. In the course of the discussion we describe and highlight the connections between some developments of Ramanujan equations and particles type solutions such as the mass of the Higgs boson, and the masses of other baryons and mesons, principally $f_0(1710)$ scalar meson candidate “glueball”. Moreover, solutions of Ramanujan equations, connected with the mass of the π meson 139.57 have been described and highlighted. Furthermore, we have obtained also the values of some black hole entropies, the value of the Cosmological Constant and some parameters of Dark Energy.

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

From:

MANUSCRIPT BOOK 1 OF SRINIVASA RAMANUJAN

Page 16



tan^-1(1/(1+sqrt2)^2)+tan^-1(1/(1+2sqrt2)^2)+tan^-1(1/(1+3sqrt2)^2)+...

Input interpretation:

$$\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\cdots$$

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

Result:

$$\sum_{n=0}^{\infty} \tan^{-1}\left(\frac{1}{(\sqrt{2}\, n + \sqrt{2} + 1)^2}\right) \approx \sum_{n=0}^{\infty} \tan^{-1}\left(\frac{1}{(1.41421\, n + 2.41421)^2}\right)$$

Approximated sum:

$$\sum_{n=1}^{\infty} \tan^{-1}\left(\frac{1}{(1 + \sqrt{2}\, n)^2}\right) \approx 0.390214$$

$0.390214 \approx \frac{\pi}{8} = 0.392699081698$

If we take

tan^-1(1/(1+sqrt2)^2)+tan^-1(1/(1+2sqrt2)^2)+tan^-1(1/(1+3sqrt2)^2)+tan^-1(1/(1+4sqrt2)^2)+tan^-1(1/(1+5sqrt2)^2)+tan^-1(1/(1+6sqrt2)^2)+tan^-1(1/(1+12sqrt2)^2)+tan^-1(1/(1+24sqrt2)^2)

we obtain:

Input:

$$\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)$$

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

Exact Result:

$$\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)$$

(result in radians)

Decimal approximation:

0.32734970681272064544443811279819288296753662817310421 6641...

(result in radians)

0.327349706…

Alternate forms:

$$\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2}-216\,845\,894\,344}{156\,747\,794\,826}\right)$$

$$\cot^{-1}\left(\left(1+\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+2\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+3\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+4\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+5\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+6\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+12\sqrt{2}\right)^2\right)+\cot^{-1}\left(\left(1+24\sqrt{2}\right)^2\right)$$

$$\tan^{-1}\left(\frac{1153-48\sqrt{2}}{1\,324\,801}\right)+\tan^{-1}\left(\frac{289-24\sqrt{2}}{82\,369}\right)+\tan^{-1}\left(\frac{73-12\sqrt{2}}{5041}\right)+\tan^{-1}\left(\frac{51-10\sqrt{2}}{2401}\right)+\tan^{-1}\left(\frac{1}{961}\left(33-8\sqrt{2}\right)\right)+\tan^{-1}\left(\frac{1}{289}\left(19-6\sqrt{2}\right)\right)+\tan^{-1}\left(\frac{1}{49}\left(9-4\sqrt{2}\right)\right)+\tan^{-1}\left(3-2\sqrt{2}\right)$$

$\cot^{-1}(x)$ is the inverse cotangent function

Alternative representations:

$$\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)=$$
$$\operatorname{sc}^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\,\middle|\,0\right)+\operatorname{sc}^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\,\middle|\,0\right)$$

$$\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)=$$

$$\tan^{-1}\left(1,\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(1,\frac{1}{(1+24\sqrt{2})^2}\right)$$

$$\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)=$$

$$i\tanh^{-1}\left(-\frac{i}{(1+\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+2\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+3\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+4\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+5\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+6\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+12\sqrt{2})^2}\right)+i\tanh^{-1}\left(-\frac{i}{(1+24\sqrt{2})^2}\right)$$

From the previous expression, we obtain:

1/(((tan^-1(1/(1+sqrt2)^2)+tan^-1(1/(1+2sqrt2)^2)+tan^-1(1/(1+3sqrt2)^2)+...)))

Input interpretation:

$$\frac{1}{\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\cdots}$$

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

Results:

$$\frac{1}{\sum_{n=0}^{\infty}\tan^{-1}\left(\frac{1}{(\sqrt{2}\,n+\sqrt{2}+1)^2}\right)}$$

1/(sum_(n=0)^∞ tan^(-1)(1/(sqrt(2) n + sqrt(2) + 1)^2))

Input interpretation:

$$\frac{1}{\sum_{n=0}^{\infty} \tan^{-1}\left(\frac{1}{(\sqrt{2}\, n + \sqrt{2} + 1)^2}\right)}$$

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

Result:

2.54648

2.54648

(((1/(sum_(n=0)^∞ tan^(-1)(1/(sqrt(2) n + sqrt(2) + 1)^2)))))^5+29+Pi

Where 29 is a Lucas number

Input interpretation:

$$\left(\frac{1}{\sum_{n=0}^{\infty} \tan^{-1}\left(\frac{1}{(\sqrt{2}\, n + \sqrt{2} + 1)^2}\right)}\right)^5 + 29 + \pi$$

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

Result:

139.22

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

And:

(((1/(sum_(n=0)^∞ tan^(-1)(1/(sqrt(2) n + sqrt(2) + 1)^2)))))^5+18

Where 18 is a Lucas number

Input interpretation:

$$\left(\frac{1}{\sum_{n=0}^{\infty} \tan^{-1}\left(\frac{1}{(\sqrt{2}\, n + \sqrt{2} + 1)^2}\right)}\right)^5 + 18$$

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

Result:

125.078

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

From the following expression:

tan^-1(1/(1+sqrt2)^2)+tan^-1(1/(1+2sqrt2)^2)+tan^-1(1/(1+3sqrt2)^2)+tan^-1(1/(1+4sqrt2)^2)+tan^-1(1/(1+5sqrt2)^2)+tan^-1(1/(1+6sqrt2)^2)+tan^-1(1/(1+12sqrt2)^2)+tan^-1(1/(1+24sqrt2)^2)

we obtain:

[1/(((tan^-1(1/(1+sqrt2)^2)+tan^-1(1/(1+2sqrt2)^2)+tan^-1(1/(1+3sqrt2)^2)+tan^-1(1/(1+4sqrt2)^2)+tan^-1(1/(1+5sqrt2)^2)+tan^-1(1/(1+6sqrt2)^2)+tan^-1(1/(1+12sqrt2)^2)+tan^-1(1/(1+24sqrt2)^2))))]^5

Input:

$$\left(1\Big/\left(\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)\right)\right)^5$$

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

Exact Result:

$$1 / \left(\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right) + \tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)\right)^5$$

(result in radians)

Decimal approximation:

266.0358831303531310292452360902628407164242284220609033941...

(result in radians)

266.03588313….

Alternate forms:

$$\frac{1}{\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

$$1 / \left(\cot^{-1}\left(\left(1+\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+2\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+3\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+4\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+5\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+6\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+12\sqrt{2}\right)^2\right) + \cot^{-1}\left(\left(1+24\sqrt{2}\right)^2\right)\right)^5$$

$$1 / \left(\tan^{-1}\left(\frac{1153-48\sqrt{2}}{1324801}\right) + \tan^{-1}\left(\frac{289-24\sqrt{2}}{82369}\right) + \tan^{-1}\left(\frac{73-12\sqrt{2}}{5041}\right) + \tan^{-1}\left(\frac{51-10\sqrt{2}}{2401}\right) + \tan^{-1}\left(\frac{1}{961}\left(33-8\sqrt{2}\right)\right) + \tan^{-1}\left(\frac{1}{289}\left(19-6\sqrt{2}\right)\right) + \tan^{-1}\left(\frac{1}{49}\left(9-4\sqrt{2}\right)\right) + \tan^{-1}\left(3-2\sqrt{2}\right)\right)^5$$

$\cot^{-1}(x)$ is the inverse cotangent function

Alternative representations:

$$\left(1\Big/\left(\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)\right)\right)^5 =$$

$$\left(1\Big/\left(\mathrm{sc}^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\,\middle|\,0\right)+\mathrm{sc}^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\,\middle|\,0\right)\right)\right)^5$$

$$\left(1\Big/\left(\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)\right)\right)^5 =$$

$$\left(1\Big/\left(\tan^{-1}\left(1,\ \frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(1,\ \frac{1}{(1+24\sqrt{2})^2}\right)\right)\right)^5$$

$$\left(1\Big/\left(\tan^{-1}\left(\frac{1}{(1+\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+2\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+3\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+4\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+5\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+6\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+12\sqrt{2})^2}\right)+\tan^{-1}\left(\frac{1}{(1+24\sqrt{2})^2}\right)\right)\right)^5 =$$

$$\left(1\Big/\left(\cot^{-1}\left(\frac{1}{\frac{1}{(1+\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+2\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+3\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+4\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+5\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+6\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+12\sqrt{2})^2}}\right)+\cot^{-1}\left(\frac{1}{\frac{1}{(1+24\sqrt{2})^2}}\right)\right)\right)^5$$

From the following alternate form

$$\frac{1}{\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

We obtain:

1/2((1/tan^(-1)((-216845894344 + 190969859251 sqrt(2))/156747794826)^5))+5+golden ratio

Where 5 is a Fibonacci number

Input:

$$\frac{1}{2}\times\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+5+\phi$$

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

ϕ is the golden ratio

Exact Result:

$$\phi+5+\frac{1}{2\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

(result in radians)

Decimal approximation:

139.6359755539264603628272048794970584759324233908362145591...

(result in radians)

139.635975… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$\frac{1}{2}\left(11+\sqrt{5}\right)+\frac{1}{2\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

$$5+\frac{1}{2}\left(1+\sqrt{5}\right)+\frac{1}{2\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

$$\phi + 5 + \frac{16}{\left(\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2} - 216\,845\,894\,344}{156\,747\,794\,826}\right) - \tan^{-1}\left(\frac{216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)\right)^5}$$

Alternative representations:

$$\frac{1}{\tan^{-1}\left(\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5 2} + 5 + \phi = 5 + \phi + \frac{1}{2\,\mathrm{sc}^{-1}\left(\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\,\middle|\,0\right)^5}$$

$$\frac{1}{\tan^{-1}\left(\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5 2} + 5 + \phi = 5 + \phi + \frac{1}{2\tan^{-1}\left(1, \frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5}$$

$$\frac{1}{\tan^{-1}\left(\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5 2} + 5 + \phi = 5 + \phi + \frac{1}{2\cot^{-1}\left(\frac{1}{\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}}\right)^5}$$

Series representations:

$$\frac{1}{\tan^{-1}\left(\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5 2} + 5 + \phi = 5 + \phi + \frac{1}{2\left(\sum_{k=0}^{\infty} \frac{(-1)^k\, 156\,747\,794\,826^{-1-2k}\left(-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}\right)^{1+2k}}{1+2k}\right)^5}$$

$$\frac{1}{\tan^{-1}\left(\frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5 2} + 5 + \phi = 5 + \phi - (16\,i) \Bigg/ \left(\log(2) - \log\left(i\left(-i + \frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)\right) - \sum_{k=1}^{\infty} \frac{\left(\frac{i}{2}\right)^k \left(-i + \frac{-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^k}{k}\right)^5$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2}+5+\phi=$$

$$5+\phi-(16\,i)\Big/\left(-\log(2)+\log\left(-i\left(i+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)\right)+\sum_{k=1}^{\infty}\frac{\left(-\frac{i}{2}\right)^k\left(i+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^k}{k}\right)^5$$

Continued fraction representations:

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2}+5+\phi=5+\phi+\left(47312642310909092068219567484966973846403528990332452688\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(-216845894344+190969859251\sqrt{2}\right)^2 k^2}{24569871182813792370276}}{1+2k}\right)^5\right)\Big/\left(-216845894344+190969859251\sqrt{2}\right)^5=5+\phi+$$

$$\left(47312642310909092068219567484966973846403528990332452688\left(1+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(24569871182813792370276\left(3+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(6142467795703448092569\left(5+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(2729985686979310263364\left(7+\left(4\left(-216845894344+190969859251\sqrt{2}\right)^2\right)\Big/(6142467795703448092569(9+\ldots))\right)\right)\right)\right)\right)\right)\right)^5\right)\Big/\left(-216845894344+190969859251\sqrt{2}\right)^5$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2}+5+\phi=5+\phi+$$

$$\left(47312642310909092068219567484966973846403528990332452688\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(216845894344-190969859251\sqrt{2}\right)^2 k^2}{24569871182813792370276}}{1+2k}\right)^5\right)\Big/\left(-216845894344+190969859251\sqrt{2}\right)^5=5+\phi+$$

$$\Big(47312642310909092068219567484966973846403528990332452688\Big(1+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\Big(24569871182813792370276\Big(3+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\Big(6142467795703448092569\Big(5+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\Big(2729985686979310263364\Big(7+\Big(4\left(216845894344-190969859251\sqrt{2}\right)^2\Big)\Big/(6142467795703448092569(9+\ldots))\Big)\Big)\Big)\Big)\Big)\Big)\Big)^5\Big)\Big/\left(-216845894344+190969859251\sqrt{2}\right)^5$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2}+5+\phi=5+\phi+$$

$$\left(47312642310909092068219567484966973846403528990332452688\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{(216845894344-190969859251\sqrt{2})^2(1-2k)^2}{24569871182813792370276}}{1+2k-\frac{(216845894344-190969859251\sqrt{2})^2(-1+2k)}{24569871182813792370276}}\right)^5\right)\Big/$$

$$\left(-216845894344+190969859251\sqrt{2}\right)^5=5+\phi+$$

$$\left(47312642310909092068219567484966973846403528990332452688\left(1+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(24569871182813792370276\left(3-\frac{(216845894344-190969859251\sqrt{2})^2}{24569871182813792370276}+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(2729985686979310263364\left(5-\frac{(216845894344-190969859251\sqrt{2})^2}{8189957060937930790092}+\left(25\left(216845894344-190969859251\sqrt{2}\right)^2\right)\Big/\left(24569871182813792370276\left(7-\left(5\left(216845894344-190969859251\sqrt{2}\right)^2\right)\Big/24569871182813792370276+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(501425942506403925924\left(9-\frac{(216845894344-190969859251\sqrt{2})^2}{3509981597544827481468}+\ldots\right)\right)\right)\right)\right)\right)\right)\right)\right)^5\right)\Big/$$

$$\left(-216845894344+190969859251\sqrt{2}\right)^5$$

1/2((1/tan^(-1)((-216845894344 + 190969859251 sqrt(2))/156747794826)^5))-11+Pi

Where 11 is a Lucas number

Input:

$$\frac{1}{2}\times\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}-11+\pi$$

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

Exact Result:

$$-11+\pi+\frac{1}{2\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

(result in radians)

Decimal approximation:

125.1595342187663587530852614284109232424092836104055575180...

(result in radians)

125.159534… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$-11+\pi+\frac{16}{\left(\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)-\tan^{-1}\left(\frac{216845894344-190969859251\sqrt{2}}{156747794826}\right)\right)^5}$$

$$-11+\pi-(16\,i)\Big/\left(\log\left(1-\frac{i\,(190969859251\sqrt{2}-216845894344)}{156747794826}\right)-\log\left(1+\frac{i\,(190969859251\sqrt{2}-216845894344)}{156747794826}\right)\right)^5$$

$$\left(1-22\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5+2\pi\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5\right)\Big/\left(2\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5\right)$$

$\log(x)$ is the natural logarithm

Alternative representations:

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi + \frac{1}{2\,\text{sc}^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826} \,\middle|\, 0\right)^5}$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi + \frac{1}{2\tan^{-1}\left(1, \frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi + \frac{1}{2\cot^{-1}\left(\frac{1}{\frac{-216845894344+190969859251\sqrt{2}}{156747794826}}\right)^5}$$

Series representations:

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi + \frac{1}{2\left(\sum_{k=0}^{\infty} \frac{(-1)^k\, 156747794826^{-1-2k}\left(-216845894344+190969859251\sqrt{2}\right)^{1+2k}}{1+2k}\right)^5}$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi - (16\,i) \Bigg/ \left(\log(2) - \log\left(i\left(-i + \frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)\right) - \sum_{k=1}^{\infty} \frac{\left(\frac{i}{2}\right)^k \left(-i + \frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^k}{k}\right)^5$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi =$$

$$-11 + \pi - (16 i) \Bigg/ \left(-\log(2) + \log\left(-i\left(i + \frac{-216845894344 + 190969859251\sqrt{2}}{156747794826}\right)\right) + \sum_{k=1}^{\infty} \frac{\left(-\frac{i}{2}\right)^k \left(i + \frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^k}{k}\right)^5$$

Continued fraction representations:

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi + \left(47312642310909092068219567484966973846403528990332452688 \left(1 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{\frac{\left(-216845894344+190969859251\sqrt{2}\right)^2 k^2}{24569871182813792370276}}{1 + 2k}\right)^5\right) \Bigg/ \left(-216845894344 + 190969859251\sqrt{2}\right)^5 = -11 + \pi + \left(47312642310909092068219567484966973846403528990332452688 \left(1 + \left(-216845894344 + 190969859251\sqrt{2}\right)^2 \Big/ \left(24569871182813792370276 \left(3 + \left(-216845894344 + 190969859251\sqrt{2}\right)^2 \Big/ \left(6142467795703448092569 \left(5 + \left(-216845894344 + 190969859251\sqrt{2}\right)^2 \Big/ \left(2729985686979310263364 \left(7 + \left(4\left(-216845894344 + 190969859251\sqrt{2}\right)^2\right) \Big/ (6142467795703448092569 (9 + \ldots))\right)\right)\right)\right)\right)\right)\right)^5\right) \Bigg/ \left(-216845894344 + 190969859251\sqrt{2}\right)^5$$

$$\frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5 2} - 11 + \pi = -11 + \pi + \left(47312642310909092068219567484966973846403528990332452688 \left(1 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{\frac{\left(216845894344-190969859251\sqrt{2}\right)^2 k^2}{24569871182813792370276}}{1+2k}\right)^5\right) \Big/ \left(-216845894344 + 190969859251\sqrt{2}\right)^5 = -11 + \pi +$$

$$\left(47312642310909092068219567484966973846403528990332452688 \left(1 + \left(216845894344 - 190969859251\sqrt{2}\right)^2 \Big/ \left(24569871182813792370276 \left(3 + \left(216845894344 - 190969859251\sqrt{2}\right)^2 \Big/ \left(6142467795703448092569 \left(5 + \left(216845894344 - 190969859251\sqrt{2}\right)^2 \Big/ \left(2729985686979310263364 \left(7 + \left(4\left(216845894344 - 190969859251\sqrt{2}\right)^2\right) \Big/ (6142467795703448092569 (9 + \ldots))\right)\right)\right)\right)\right)\right)\right)^5\right) \Big/ \left(-216845894344 + 190969859251\sqrt{2}\right)^5$$

$$\frac{1}{\tan^{-1}\left(\frac{-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5 2} - 11 + \pi = -11 + \pi + \left(47\,312\,642\,310\,909\,092\,068\,219\,567\,484\,966\,973\,846\,403\,528\,990\,332\,452\,688 \left(1 + \underset{k=1}{\overset{\infty}{\mathrm{K}}} \frac{\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2 (1-2k)^2}{24\,569\,871\,182\,813\,792\,370\,276}}{1+2k-\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2 (-1+2k)}{24\,569\,871\,182\,813\,792\,370\,276}}\right)^5\right) \Big/ \left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^5 = -11 + \pi +$$

$$\left(47\,312\,642\,310\,909\,092\,068\,219\,567\,484\,966\,973\,846\,403\,528\,990\,332\,452\,688 \left(1 + \left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2 \Big/ \left(24\,569\,871\,182\,813\,792\,370\,276 \left(3 - \frac{\left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2}{24\,569\,871\,182\,813\,792\,370\,276} + \left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2 \Big/ \left(2\,729\,985\,686\,979\,310\,263\,364 \left(5 - \frac{\left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2}{8\,189\,957\,060\,937\,930\,790\,092} + \left(25\left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2\right) \Big/ \left(24\,569\,871\,182\,813\,792\,370\,276 \left(7 - \left(5\left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2\right) \Big/ 24\,569\,871\,182\,813\,792\,370\,276 + \left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2 \Big/ \left(501\,425\,942\,506\,403\,925\,924 \left(9 - \frac{\left(216\,845\,894\,344 - 190\,969\,859\,251\sqrt{2}\right)^2}{3\,509\,981\,597\,544\,827\,481\,468} + \ldots\right)\right)\right)\right)\right)\right)\right)\right)\right)^5\right) \Big/ \left(-216\,845\,894\,344 + 190\,969\,859\,251\sqrt{2}\right)^5$$

2Pi*((1/tan^(-1)((-216845894344 + 190969859251 sqrt(2))/156747794826)^5))+47+11-1/golden ratio

Where 47 and 11 are Lucas numbers

Input:

$$2\pi \times \frac{1}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5} + 47 + 11 - \frac{1}{\phi}$$

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

ϕ is the golden ratio

Exact Result:

$$-\frac{1}{\phi} + 58 + \frac{2\pi}{\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

(result in radians)

Decimal approximation:

1728.934718078430510743282317395182371646810220521659841850...

(result in radians)

1728.934718….

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

Alternate forms:

$$58 - \frac{2}{1+\sqrt{5}} + \frac{2\pi}{\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

$$\frac{1}{2}\left(117-\sqrt{5}\right) + \frac{2\pi}{\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

$$\frac{2\left(28+29\sqrt{5}\right)}{1+\sqrt{5}} + \frac{2\pi}{\tan^{-1}\left(\frac{190969859251\sqrt{2}-216845894344}{156747794826}\right)^5}$$

Alternative representations:

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+\frac{2\pi}{\operatorname{sc}^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\,\middle|\,0\right)^5}$$

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+\frac{2\pi}{\tan^{-1}\left(1,\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}$$

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+\frac{2\pi}{\cot^{-1}\left(\frac{1}{\frac{-216845894344+190969859251\sqrt{2}}{156747794826}}\right)^5}$$

Series representations:

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+\frac{2\pi}{\left(\sum_{k=0}^{\infty}\frac{(-1)^k\,156747794826^{-1-2k}\left(-216845894344+190969859251\sqrt{2}\right)^{1+2k}}{1+2k}\right)^5}$$

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}-(64\,i\,\pi)\Bigg/\left(\log(2)-\log\left(i\left(-i+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)\right)-\sum_{k=1}^{\infty}\frac{\left(\frac{i}{2}\right)^k\left(-i+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^k}{k}\right)^5$$

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=$$

$$58-\frac{1}{\phi}-(64\,i\,\pi)\Bigg/\left(-\log(2)+\log\left(-i\left(i+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)\right)+\sum_{k=1}^{\infty}\frac{\left(-\frac{i}{2}\right)^k\left(i+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^k}{k}\right)^5$$

Continued fraction representations:

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+\left(189250569243636368272878269939867895385614115961329810752\,\pi\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(-216845894344+190969859251\sqrt{2}\right)^2k^2}{24569871182813792370276}}{1+2k}\right)^5\right)\Bigg/\left(-216845894344+190969859251\sqrt{2}\right)^5=58-\frac{1}{\phi}+$$

$$\left(189250569243636368272878269939867895385614115961329810752\,\pi\left(1+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(24569871182813792370276\left(3+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(6142467795703448092569\left(5+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(2729985686979310263364\left(7+\left(4\left(-216845894344+190969859251\sqrt{2}\right)^2\right)\Big/\left(6142467795703448092569(9+\ldots)\right)\right)\right)\right)\right)\right)\right)\right)^5\right)\Bigg/\left(-216845894344+190969859251\sqrt{2}\right)^5$$

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+$$

$$\left(189250569243636368272878269939867895385614115961329810752\,\pi\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(216845894344-190969859251\sqrt{2}\right)^2 k^2}{24569871182813792370276}}{1+2k}\right)^5\right)\Big/\left(-216845894344+190969859251\sqrt{2}\right)^5=58-\frac{1}{\phi}+$$

$$\left(189250569243636368272878269939867895385614115961329810752\,\pi\left(1+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(24569871182813792370276\left(3+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(6142467795703448092569\left(5+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(2729985686979310263364\left(7+\left(4\left(216845894344-190969859251\sqrt{2}\right)^2\right)\Big/(6142467795703448092569(9+\ldots))\right)\right)\right)\right)\right)\right)\right)^5\right)\Big/\left(-216845894344+190969859251\sqrt{2}\right)^5$$

$$\frac{2\pi}{\tan^{-1}\left(\frac{-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)^5}+47+11-\frac{1}{\phi}=58-\frac{1}{\phi}+$$

$$\left(189\,250\,569\,243\,636\,368\,272\,878\,269\,939\,867\,895\,385\,614\,115\,961\,329\,810\,752\right.$$

$$\left.\pi\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2(1-2k)^2}{24\,569\,871\,182\,813\,792\,370\,276}}{1+2k-\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2(-1+2k)}{24\,569\,871\,182\,813\,792\,370\,276}}\right)^5\right)\Big/$$

$$\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^5=58-\frac{1}{\phi}+$$

$$\left(189\,250\,569\,243\,636\,368\,272\,878\,269\,939\,867\,895\,385\,614\,115\,961\,329\,810\,752\right.$$

$$\pi\left(1+\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2\Big/\right.$$

$$\left(24\,569\,871\,182\,813\,792\,370\,276\right.$$

$$\left(3-\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2}{24\,569\,871\,182\,813\,792\,370\,276}+\right.$$

$$\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2\Big/$$

$$\left(2\,729\,985\,686\,979\,310\,263\,364\right.$$

$$\left(5-\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2}{8\,189\,957\,060\,937\,930\,790\,092}+\right.$$

$$\left(25\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2\right)\Big/\left(24\,569\,871\,182\,813\,792\,370\,276\right.$$

$$\left(7-\left(5\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2\right)\Big/24\,569\,871\,182\,813\,792\,370\,276+\right.$$

$$\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2\Big/\left(501\,425\,942\,506\,403\,925\,924\left(9-\right.\right.$$

$$\frac{\left(216\,845\,894\,344-190\,969\,859\,251\sqrt{2}\right)^2}{3\,509\,981\,597\,544\,827\,481\,468}$$

$$\left.\left.\left.\left.\left.\left.\left.\left.\left.\left.+\ldots\right)\right)\right)\right)\right)\right)\right)\right)\right)^5\right)\Big/$$

$$\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^5$$

From the previous expression, by the alternate form

$$\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2}-216\,845\,894\,344}{156\,747\,794\,826}\right)$$

We obtain:

1/10^52((((tan^(-1)((-216845894344 + 190969859251 sqrt(2))/156747794826) + 1/golden ratio + (18-2)/10^2 + 2/10^4))))

Where 18 and 2 are Lucas numbers

Input:

$$\frac{1}{10^{52}}\left(\tan^{-1}\left(\frac{-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}\right)$$

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

ϕ is the golden ratio

Exact Result:

$$\frac{\frac{1}{\phi}+\frac{801}{5000}+\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2}-216\,845\,894\,344}{156\,747\,794\,826}\right)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

(result in radians)

Decimal approximation:

$1.1055836955626154936490249471638310006878458079788670\ldots\times10^{-52}$

(result in radians)

$1.105583695\ldots*10^{-52}$ result practically equal to the value of Cosmological Constant $1.1056*10^{-52}\ m^{-2}$

Alternate forms:

$$\frac{\phi\left(801+5000\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2}-216\,845\,894\,344}{156\,747\,794\,826}\right)\right)+5000}{50\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\phi}$$

$$\frac{\frac{2500\sqrt{5}-1699}{5000}+\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2}-216\,845\,894\,344}{156\,747\,794\,826}\right)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\frac{801}{5000}+\frac{2}{1+\sqrt{5}}+\tan^{-1}\left(\frac{190\,969\,859\,251\sqrt{2}-216\,845\,894\,344}{156\,747\,794\,826}\right)}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Alternative representations:

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} = \frac{\text{sc}^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\,\middle|\,0\right)+\frac{1}{\phi}+\frac{16}{10^2}+\frac{2}{10^4}}{10^{52}}$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} = \frac{\tan^{-1}\left(1, \frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{16}{10^2}+\frac{2}{10^4}}{10^{52}}$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} = \frac{i\tanh^{-1}\left(-\frac{i\left(-216845894344+190969859251\sqrt{2}\right)}{156747794826}\right)+\frac{1}{\phi}+\frac{16}{10^2}+\frac{2}{10^4}}{10^{52}}$$

Series representations:

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} = \frac{801}{50\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{1}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\phi} + \frac{\sum_{k=0}^{\infty}\frac{(-1)^k\,156747794826^{-1-2k}\left(-216845894344+190969859251\sqrt{2}\right)^{1+2k}}{1+2k}}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} =$$

$$\frac{801}{50\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} + \frac{1}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,\phi} + \left(\sum_{k=0}^{\infty} \frac{1}{1+2k}\left(-\frac{1}{5}\right)^k \left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^{1+2k} \left(78\,373\,897\,413 \left(1+\sqrt{1+\frac{\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2}{30\,712\,338\,978\,517\,240\,462\,845}}\right)\right)^{-1-2k} F_{1+2k}\right) / 10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} =$$

$$\left(\frac{801}{5000}+\frac{1}{\phi}+\frac{1}{313\,495\,589\,652}\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right) \sum_{j=0}^{\infty} \operatorname{Res}_{s=-j} \frac{1}{\Gamma\left(\frac{3}{2}-s\right)} 24\,569\,871\,182\,813\,792\,370\,276^s \left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^{-2s} \Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)\right) / 10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

Integral representations:

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} =$$

$$\left(\frac{801}{5000}+\frac{1}{\phi}+\frac{-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}}{156\,747\,794\,826} \int_0^1 \frac{1}{1+\frac{\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2 t^2}{24\,569\,871\,182\,813\,792\,370\,276}}\,dt\right) / 10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} =$$

$$\left(\frac{801}{5000}+\frac{1}{\phi}-\frac{i\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)}{626\,991\,179\,304\,\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\Gamma\left(\frac{3}{2}-s\right)}\,24\,569\,871\,182\,813\,792\,370\,276^s\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^{-2s}\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)\,ds\right)\Big/ 10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

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

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}} =$$

$$\left(\frac{801}{5000}+\frac{1}{\phi}-\frac{i\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)}{626\,991\,179\,304\,\pi^{3/2}}\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(1+\frac{\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2}{24\,569\,871\,182\,813\,792\,370\,276}\right)^{-s}\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\,\Gamma(s)^2\,ds\right)\Big/ 10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

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

Continued fraction representations:

$$\frac{\tan^{-1}\left(\frac{-216845\,894344+190969\,859251\sqrt{2}}{156\,747\,794\,826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}}=$$

$$\frac{\frac{801}{5000}+\frac{1}{\phi}+\frac{-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}}{156747\,794826\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2 k^2}{24\,569\,871\,182\,813\,792\,370\,276}}{1+2k}\right)}}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}=$$

$$\left(\frac{801}{5000}+\frac{1}{\phi}+\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)\Big/\left(156\,747\,794\,826\left(1+\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2\Big/\left(24\,569\,871\,182\,813\,792\,370\,276\left(3+\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2\Big/\left(6\,142\,467\,795\,703\,448\,092\,569\left(5+\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2\Big/\left(2\,729\,985\,686\,979\,310\,263\,364\left(7+\left(4\left(-216\,845\,894\,344+190\,969\,859\,251\sqrt{2}\right)^2\right)\Big/(6\,142\,467\,795\,703\,448\,092\,569(9+\ldots))\right)\right)\right)\right)\right)\right)\right)\right)\right)\Big/$$

$$10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}}=$$

$$\frac{\frac{801}{5000}+\frac{1}{\phi}+\frac{-216845894344+190969859251\sqrt{2}}{156747794826\left(1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(216845894344-190969859251\sqrt{2}\right)^2k^2}{24569871182813792370276}}{1+2k}\right)}}{10000000000000000000000000000000000000000000000000000}=$$

$$\left(\frac{801}{5000}+\frac{1}{\phi}+\left(-216845894344+190969859251\sqrt{2}\right)\Big/\left(156747794826\left(1+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(24569871182813792370276\left(3+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(6142467795703448092569\left(5+\left(216845894344-190969859251\sqrt{2}\right)^2\Big/\left(2729985686979310263364\left(7+\left(4\left(216845894344-190969859251\sqrt{2}\right)^2\right)\Big/(6142467795703448092569(9+\ldots))\right)\right)\right)\right)\right)\right)\right)\right)\right)\Big/10000000000000000000000000000000000000000000000000000$$

$$\frac{\tan^{-1}\left(\frac{-216845894344+190969859251\sqrt{2}}{156747794826}\right)+\frac{1}{\phi}+\frac{18-2}{10^2}+\frac{2}{10^4}}{10^{52}}=$$

$$\left(\frac{801}{5000}+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}+\frac{1}{\phi}-\left(-216845894344+190969859251\sqrt{2}\right)^3\Big/\left(3851273127064946263818986668991976\left(3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{\frac{\left(-216845894344+190969859251\sqrt{2}\right)^2\left(1+(-1)^{1+k}+k\right)^2}{24569871182813792370276}}{3+2k}\right)\right)\right)\Big/$$

$$10000000000000000000000000000000000000000000000000000=$$

$$\left(\frac{801}{5000}+\frac{-216845894344+190969859251\sqrt{2}}{156747794826}+\frac{1}{\phi}-\left(-216845894344+190969859251\sqrt{2}\right)^3\Big/\left(3851273127064946263818986668991976\left(3+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(2729985686979310263364\left(5+\left(-216845894344+190969859251\sqrt{2}\right)^2\Big/\left(6142467795703448092569\left(7+\left(25\left(-216845894344+190969859251\sqrt{2}\right)^2\right)\Big/\left(24569871182813792370276\left(9+\left(4\left(-216845894344+190969859251\sqrt{2}\right)^2\right)\Big/\left(6142467795703448092569\left(11+\ldots\right)\right)\right)\right)\right)\right)\right)\right)\right)\right)\right)\Big/$$

$$10000000000000000000000000000000000000000000000000000$$

With regard Pi/8, we obtain:

Pi/8

Input:

$\frac{\pi}{8}$

Decimal approximation:

0.3926990816987241548078304229099378605246461749218882276 21...

0.392699081….

Property:

$\frac{\pi}{8}$ is a transcendental number

Alternative representations:

$$\frac{\pi}{8} = \frac{180\,°}{8}$$

$$\frac{\pi}{8} = -\frac{1}{8}\, i \log(-1)$$

$$\frac{\pi}{8} = \frac{1}{8} \cos^{-1}(-1)$$

Series representations:

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

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

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

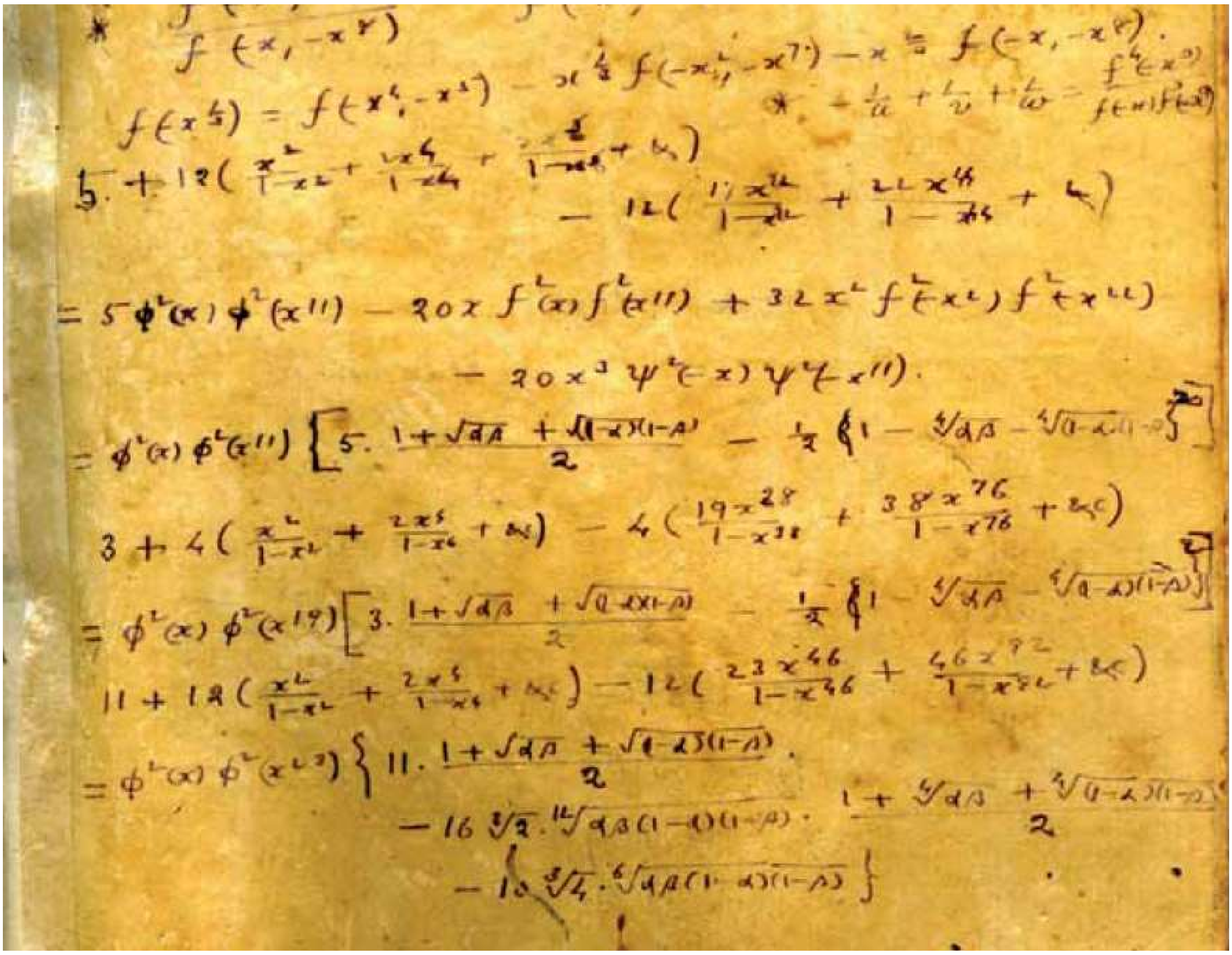
Integral representations:

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

$$\frac{\pi}{8} = \frac{1}{4} \int_0^1 \frac{1}{\sqrt{1-t^2}}\, dt$$

$$\frac{\pi}{8} = \frac{1}{4} \int_0^{\infty} \frac{1}{1+t^2}\, dt$$

Page 310 Manuscript 1



11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))

Input:

$$11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)$$

Exact result:

$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{330\,117\,343\,809\,434\,739\,973\,099\,793}$$

Decimal approximation:

797.40000000000392219590139592023927696384525370066764323338...

797.4…

Alternate form:

$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{330\,117\,343\,809\,434\,739\,973\,099\,793}$$

Mixed fraction:

$$797\frac{132046937525068680882108990}{330117343809434739973099793}$$

Continued fraction:

$$797+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{10\,198\,368\,721+\cfrac{1}{6899+\cfrac{1}{1+\cfrac{1}{1\,274\,796\,089+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\frac{1}{7}}}}}}}}}}}}}$$

2((11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))))+123+11

Where 123 and 11 are Lucas numbers

Input:

$$2\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+123+11$$

Exact result:

$$\frac{570\,706\,863\,977\,753\,368\,035\,280\,660\,284}{330\,117\,343\,809\,434\,739\,973\,099\,793}$$

Decimal approximation:

1728.8000000000078443918027918404785539276905074013352864 67...

1728.8….

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

Alternate form:

$$\frac{570706863977753368035280660284}{330117343809434739973099793}$$

Mixed fraction:

$$1728\frac{264093875050137361764217980}{330117343809434739973099793}$$

Continued fraction:

$$1728+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{5099184360+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3449+\cfrac{1}{2+\cfrac{1}{637398044+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\frac{1}{2}}}}}}}}}}}}$$

((11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))))-18+Pi

Where 18 is a Lucas number

Input:

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi$$

Result:

$$\frac{257293457765074731119926847737}{330117343809434739973099793}+\pi$$

Decimal approximation:

782.5415926535937154343640393035187798480424231000427490548...

782.541592…. result practically equal to the rest mass of Omega meson 782.65

Property:

$$\frac{257293457765074731119926847737}{330117343809434739973099793}+\pi \text{ is a transcendental number}$$

Alternate forms:

$$\frac{257293457765074731119926847737+330117343809434739973099793\,\pi}{330117343809434739973099793}$$

$$\frac{257293457765074731119926847737+330117343809434739973099793\,\pi}{330117343809434739973099793}$$

Continued fraction:

$$782+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{22+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{31+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Alternative representations:

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi=$$

$$-7+180\,°+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)$$

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = -7-i\log(-1)+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)$$

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = -7+\cos^{-1}(-1)+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)$$

Series representations:

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = \frac{257293457765074731119926847737}{330117343809434739973099793}+4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = \frac{257293457765074731119926847737}{330117343809434739973099793}+\sum_{k=0}^{\infty}-\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}$$

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = \frac{257293457765074731119926847737}{330117343809434739973099793}+\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = \frac{257293457765074731119926847737}{330117343809434739973099793}+4\int_0^1\sqrt{1-t^2}\,dt$$

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi = \frac{257293457765074731119926847737}{330117343809434739973099793}+2\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-18+\pi=$$
$$\frac{257\,293\,457\,765\,074\,731\,119\,926\,847\,737}{330\,117\,343\,809\,434\,739\,973\,099\,793}+2\int_0^\infty \frac{1}{1+t^2}\,dt$$

1/6((11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))))+2Pi+1/golden ratio

Input:

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{1}{\phi}+\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+2\pi$$

Decimal approximation:

139.80121929593013502444677292096452338008885692866724837 63...

139.80121929…. result practically equal to the rest mass of Pion meson 139.57 MeV

Property:

$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+2\pi \text{ is a transcendental number}$$

Alternate forms:

$$\left(262\,245\,217\,922\,216\,252\,219\,523\,344\,632+990\,352\,031\,428\,304\,219\,919\,299\,379\sqrt{5}+3\,961\,408\,125\,713\,216\,879\,677\,197\,516\,\pi\right)/1\,980\,704\,062\,856\,608\,439\,838\,598\,758$$

$$(263\,235\,569\,953\,644\,556\,439\,442\,644\,011\,\phi+3\,961\,408\,125\,713\,216\,879\,677\,197\,516\,\pi\,\phi+1\,980\,704\,062\,856\,608\,439\,838\,598\,758)/(1\,980\,704\,062\,856\,608\,439\,838\,598\,758\,\phi)$$

$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{2}{1+\sqrt{5}}+2\pi$$

Alternative representations:

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=$$
$$2\pi+-\frac{1}{2\cos(216\,°)}+\frac{1}{6}\left(11+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=$$
$$360\,°+-\frac{1}{2\cos(216\,°)}+\frac{1}{6}\left(11+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=$$
$$2\pi+\frac{1}{2\cos\left(\frac{\pi}{5}\right)}+\frac{1}{6}\left(11+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)$$

Series representations:

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=$$
$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+8\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=$$
$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+\sum_{k=0}^{\infty}-\frac{8\,(-1)^k\,1195^{-1-2k}\left(5^{1+2k}-4\times 239^{1+2k}\right)}{1+2k}$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=$$
$$\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+2\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+8\int_0^1\sqrt{1-t^2}\,dt$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+4\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)+2\pi+\frac{1}{\phi}=\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}+\frac{1}{\phi}+4\int_0^\infty\frac{1}{1+t^2}\,dt$$

1/6((11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))))-7-1/golden ratio

where 7 is a Lucas number

Input:

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-7-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{249\,370\,641\,513\,648\,297\,360\,572\,452\,705}{1\,980\,704\,062\,856\,608\,439\,838\,598\,758}-\frac{1}{\phi}$$

Decimal approximation:

125.28196601125075885111231248567424137625389977030551101 01...

125.281966…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$\frac{250360993545076601580491752084 - 990352031428304219919299379\sqrt{5}}{1980704062856608439838598758}$$

$$-\frac{1980704062856608439838598758 - 249370641513648297360572452705\,\phi}{1980704062856608439838598758\,\phi}$$

$$\frac{249370641513648297360572452705\,\phi - 1980704062856608439838598758}{1980704062856608439838598758\,\phi}$$

Alternative representations:

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-7-\frac{1}{\phi} = -7+\frac{1}{6}\left(11+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-\frac{1}{2\sin(54^\circ)}$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-7-\frac{1}{\phi} = -7--\frac{1}{2\cos(216^\circ)}+\frac{1}{6}\left(11+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)$$

$$\frac{1}{6}\left(11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)-7-\frac{1}{\phi} = -7+\frac{1}{6}\left(11+12\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)\right)--\frac{1}{2\sin(666^\circ)}$$

1/10^52((((1+1/((11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))))+(76+29)/10^3-7/10^4))))

where 7, 29 and 76 are Lucas numbers

Input:

$$\frac{1}{10^{52}}\left(1+\frac{1}{11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)}+\frac{76+29}{10^3}-\frac{7}{10^4}\right)$$

Exact result:

2910211572436191184160496115743473 /
26323556995364455643944264401100000000000000000000000000000000000000000000000000000000

Decimal approximation:

$1.1055540757461750628057051019715804684585174184916532... \times 10^{-52}$

$1.105554075...*10^{-52}$ result practically equal to the value of Cosmological Constant $1.1056*10^{-52}$ m^{-2}

Alternate form:

2 910 211 572 436 191 184 160 496 115 743 473 / 26 323 556 995 364 455 643 944 264 401 100 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Or:

1/10^52(((((11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92))))))^1/(76-11)-26/10^4)))

Input:

$$\frac{1}{10^{52}}\left(\sqrt[76-11]{11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)}-\frac{26}{10^4}\right)$$

Result:

$$\frac{\sqrt[65]{\frac{263235569953644556439442644011}{330117343809434739973099793}}-\frac{13}{5000}}{10000000000000000000000000000000000000000000000000000}$$

Decimal approximation:

$1.1056587600373385535582711646108932935595666539265738... \times 10^{-52}$

$1.10565876...*10^{-52}$ result practically equal to the value of Cosmological Constant $1.1056*10^{-52}$ m^{-2}

Alternate forms:

$$\left(5000 \times 330117343809434739973099793^{64/65}\sqrt[65]{263235569953644556439442644011} - 4291525469522651619650297309\right) / 16505867190471736998654989650000000000000000000000000000000000000000000000000000$$

$$\frac{5000\sqrt[65]{\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{330\,117\,343\,809\,434\,739\,973\,099\,793}}-13}{50\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\sqrt[65]{\frac{263\,235\,569\,953\,644\,556\,439\,442\,644\,011}{330\,117\,343\,809\,434\,739\,973\,099\,793}}}{10\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000} - \frac{13}{50\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

3+4(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-4((((19*2^38)/(1-2^38)+(38*2^76)/(1-2^76))))

Input:

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)$$

Exact result:

$$\frac{1\,093\,742\,054\,024\,961\,387\,511\,299}{5\,037\,190\,915\,060\,954\,894\,609}$$

Decimal approximation:

217.133333333609819722675321072534102312558158607927131597 4...

217.13333….

Alternate form:

$$\frac{1\,093\,742\,054\,024\,961\,387\,511\,299}{5\,037\,190\,915\,060\,954\,894\,609}$$

Mixed fraction:

$$217\frac{671625456734175381146}{5037190915060954894609}$$

Continued fraction:

$$217+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{16074730+\cfrac{1}{1+\cfrac{1}{14+\cfrac{1}{75+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{2009340+\cfrac{1}{2+\cfrac{1}{29+\cfrac{1}{1+\frac{1}{9}}}}}}}}}}}}}}$$

3+4(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-4((((19*2^38)/(1-2^38)+(38*2^76)/(1-2^76))))
- 76 - golden ratio

Where 76 is a Lucas number

Input:

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)-76-\phi$$

ϕ is the golden ratio

Result:

$$\frac{710915544480328815521015}{5037190915060954894609}-\phi$$

Decimal approximation:

139.51529934485992487447073423816846419483784942812136873 53...

139.515299…. result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$\frac{1416793898045596676147421-5037190915060954894609\sqrt{5}}{10074381830121909789218}$$

$$\frac{710915544480328815521015-5037190915060954894609\,\phi}{5037190915060954894609}$$

$$\frac{1416793898045596676147421}{10074381830121909789218} - \frac{\sqrt{5}}{2}$$

Alternative representations:

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)-76-\phi = -73+4\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)-2\sin(54\,°)$$

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)-76-\phi = -73+2\cos(216\,°)+4\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)$$

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)-76-\phi = -73+4\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)+2\sin(666\,°)$$

3+4(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-4((((19*2^38)/(1-2^38)+(38*2^76)/(1-2^76)))) - 89 - golden ratio^2

Input:

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)-89-\phi^2$$

ϕ is the golden ratio

Result:

$$\frac{645432062584536401891098}{5037190915060954894609} - \phi^2$$

Decimal approximation:

125.51529934485992487447073423816846419483784942812136873 53...

125.515299… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$\frac{1\,275\,752\,552\,423\,889\,939\,098\,369 - 5\,037\,190\,915\,060\,954\,894\,609\sqrt{5}}{10\,074\,381\,830\,121\,909\,789\,218}$$

$$\frac{1\,275\,752\,552\,423\,889\,939\,098\,369}{10\,074\,381\,830\,121\,909\,789\,218} - \frac{\sqrt{5}}{2}$$

$$\frac{645\,432\,062\,584\,536\,401\,891\,098 - 5\,037\,190\,915\,060\,954\,894\,609\,\phi^2}{5\,037\,190\,915\,060\,954\,894\,609}$$

Alternative representations:

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)-89-\phi^2 = -86+4\left(-\frac{4}{3}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)-(2\sin(54°))^2$$

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)-89-\phi^2 = -86-(-2\cos(216°))^2+4\left(-\frac{4}{3}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)$$

$$3+4\left(\frac{2^2}{1-2^2}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)-89-\phi^2 = -86+4\left(-\frac{4}{3}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)-(-2\sin(666°))^2$$

8* (((3+4(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-4((((19*2^38)/(1-2^38)+(38*2^76)/(1-2^76)))))))-8

Where 8 is a Fibonacci number

Input:

$$8\left(3+4\left(\frac{2^2}{1-2^2}+\frac{2\times2^4}{1-2^4}\right)-4\left(\frac{19\times2^{38}}{1-2^{38}}+\frac{38\times2^{76}}{1-2^{76}}\right)\right)-8$$

Exact result:

$$\frac{8\,709\,638\,904\,879\,203\,460\,933\,520}{5\,037\,190\,915\,060\,954\,894\,609}$$

Decimal approximation:

1729.066666668878557781402568580272818500465268863417052779...

1729.066…

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

Alternate form:

$$\frac{8709638904879203460933520}{5037190915060954894609}$$

2* (((3+4(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-4((((19*2^38)/(1-2^38)+(38*2^76)/(1-2^76)))))))+47+golden ratio

Where 47 is a Lucas number

Input:

$$2\left(3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)+47+\phi$$

ϕ is the golden ratio

Result:

$$\phi+\frac{2424232081057787655069221}{5037190915060954894609}$$

Decimal approximation:

482.8847006559695342935552289794338427428366263956600260571...

482.8847006… result very near to Holographic Ricci dark energy model, where

$\chi^2_{\rm RDE} = 483.130.$

Alternate forms:

$$\frac{4853501353030636265033051 + 5037190915060954894609\sqrt{5}}{10074381830121909789218}$$

$$\frac{5037190915060954894609\,\phi + 2424232081057787655069221}{5037190915060954894609}$$

$$\frac{4853501353030636265033051}{10074381830121909789218} + \frac{\sqrt{5}}{2}$$

Alternative representations:

$$2\left(3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)+47+\phi = 47+2\left(3+4\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)+2\sin(54°)$$

$$2\left(3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)+47+\phi = 47-2\cos(216°)+2\left(3+4\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)$$

$$2\left(3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)+47+\phi = 47+2\left(3+4\left(-\frac{4}{3}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)-2\sin(666°)$$

We observe also that from the sum of the two results, adding 5 that is a Fibonacci number, we obtain:

11+12(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-12((((23*2^46)/(1-2^46)+(46*2^92)/(1-2^92)))) + (((3+4(((2^2/(1-2^2))+(2*2^4)/(1-2^4)))-4((((19*2^38)/(1-2^38)+(38*2^76)/(1-2^76)))))))+5

Input:

$$11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{23\times 2^{46}}{1-2^{46}}+\frac{46\times 2^{92}}{1-2^{92}}\right)+\left(3+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{19\times 2^{38}}{1-2^{38}}+\frac{38\times 2^{76}}{1-2^{76}}\right)\right)+5$$

Exact result:

$$\frac{1695345363604491043436883743614143568419476425677491}{1662864085140938431378392734842904212377354715937}$$

Decimal approximation:

1019.533333333613741918576716992773379276403412308594774831...

1019.5333… result practically equal to the rest mass of Phi meson 1019.445

Alternate form:

$$\frac{1695345363604491043436883743614143568419476425677491}{1662864085140938431378392734842904212377354715937}$$

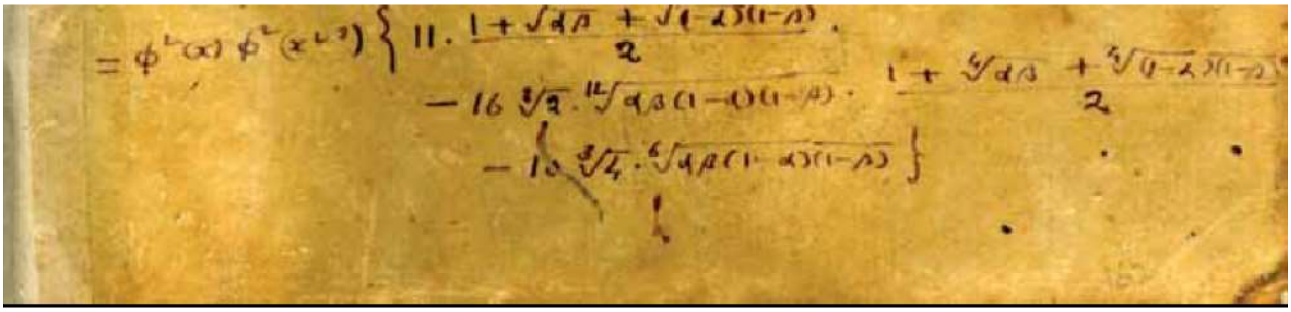
Mixed fraction:

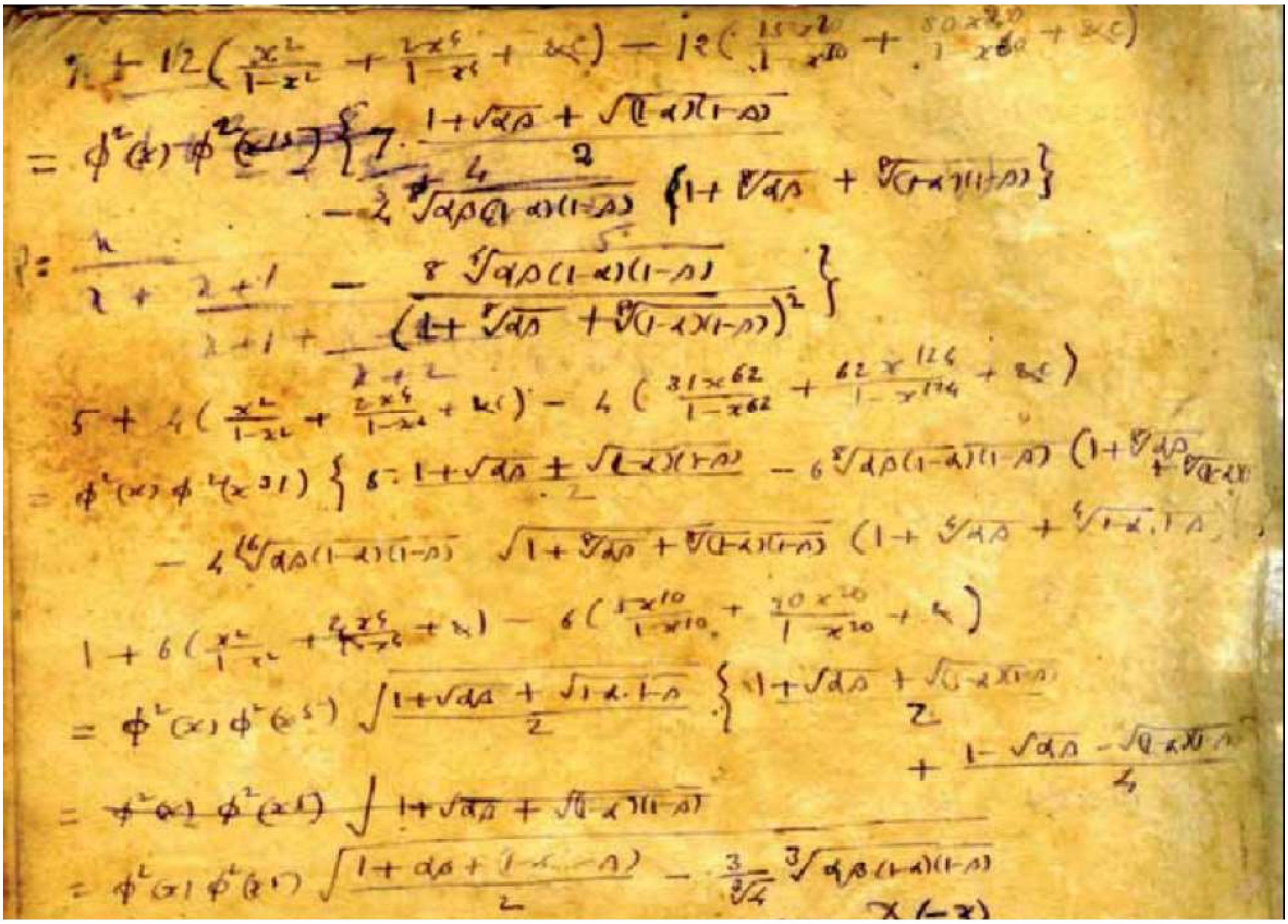
$$1019\frac{886860845874781862301546809224176006951970137688}{1662864085140938431378392734842904212377354715937}$$

Continued fraction:

$$1019+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{15849886+\cfrac{1}{3+\cfrac{1}{19+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\frac{1}{4}}}}}}}}}}}}}}}}$$

Page 311





Now, we have that:

11+12 (((2^2/(1-2^2))+((2*2^4)/(1-2^4))))-12(((15*2^10)/(1-2^10))+(30*2^20)/(1-2^20))

Input:

$$11+12\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-12\left(\frac{15\times 2^{10}}{1-2^{10}}+\frac{30\times 2^{20}}{1-2^{20}}\right)$$

Exact result:

$$\frac{35\,621\,931}{69\,905}$$

Decimal approximation:

509.57629640226021028538731135111937629640226021028538731 13...

509.5762964…

Mixed fraction:

$$509\frac{40286}{69905}$$

Continued fraction:

$$509+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{19+\cfrac{1}{1+\cfrac{1}{4}}}}}}}}}}}$$

5+4 (((2^2/(1-2^2))+((2*2^4)/(1-2^4))))-4(((31*2^62)/(1-2^62))+(62*2^124)/(1-2^124))

Input:

$$5+4\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-4\left(\frac{31\times 2^{62}}{1-2^{62}}+\frac{62\times 2^{124}}{1-2^{124}}\right)$$

Exact result:

$$\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}$$

Decimal approximation:

363.13333333333333336022154721097384331420951873514352589 65...

363.1333…

Alternate form:

$$\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}$$

Mixed fraction:

$$363\frac{189045759400521406714034756461833482}{1417843195503910264430727530965700881}$$

Continued fraction:

$$363+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{165293405678400+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{123+\cfrac{1}{7+\cfrac{1}{1+1\times\frac{1}{1}}}}}}}}}}}$$

1+6 (((2^2/(1-2^2))+((2*2^4)/(1-2^4))))-6(((5*2^10)/(1-2^10))+(10*2^20)/(1-2^20))

Input:

$$1+6\left(\frac{2^2}{1-2^2}+\frac{2\times 2^4}{1-2^4}\right)-6\left(\frac{5\times 2^{10}}{1-2^{10}}+\frac{10\times 2^{20}}{1-2^{20}}\right)$$

Exact result:

$$\frac{981877}{13981}$$

Decimal approximation:

70.229382733710035047564551891853229382733710035047564551 89...

70.2293827…

Mixed fraction:

$$70\frac{3207}{13981}$$

Continued fraction:

$$70+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{2+\frac{1}{3}}}}}}}}}}}$$

We observe that, from the sum of the three results:

35621931/69905+514866125727319947395068128497011253285/1417843195503910264430727530965700881+981877/13981

We obtain:

(35621931/69905)+(514866125727319947395068128497011253285/1417843195503910264430727530965700881)+(981877/13981)-4

Where 4 is a Lucas number

Input:

$$\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}+\frac{981877}{13981}-4$$

Exact result:

$$\frac{93062309800060263697797495157845549949832101}{99114328581700847035030008052157320086305}$$

Decimal approximation:

938.93901246930357869317341045394644899334548898047647775 97...

938.93901246… result practically equal to the rest mass of neutron mass in MeV

2*((((35621931/69905)+(514866125727319947395068128497011253285/1417843195503910264430727530965700881)+(981877/13981))))-123-29-Pi-golden ratio

Where 123 and 29 are Lucas numbers

Input:

$$2\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-123-29-\pi-\phi$$

ϕ is the golden ratio

Result:

$$-\phi+\frac{171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282}{99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305}-\pi$$

Decimal approximation:

1729.118398296267469299679590690247756984773499381772086836...

1729.118398…

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

Property:

$$\frac{171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282}{99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305}-\phi-\pi$$ is a transcendental number

Alternate forms:

$$\left(343\,605\,198\,240\,129\,509\,998\,066\,308\,304\,308\,734\,294\,386\,259-99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305\sqrt{5}-198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610\,\pi\right)/198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610$$

$$(-99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305\,\phi+171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282-99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305\,\pi)/99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305$$

$$\frac{343605198240129509998066308304308734294386259}{198228657163401694070060016104314640172610} - \frac{\sqrt{5}}{2} - \pi$$

Alternative representations:

$$2\left(\frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881} + \frac{981877}{13981}\right) - 123 - 29 - \pi - \phi = -152 - \pi + 2\cos(216\,°) + 2\left(\frac{981877}{13981} + \frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}\right)$$

$$2\left(\frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881} + \frac{981877}{13981}\right) - 123 - 29 - \pi - \phi = -152 - 180\,° + 2\cos(216\,°) + 2\left(\frac{981877}{13981} + \frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}\right)$$

$$2\left(\frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881} + \frac{981877}{13981}\right) - 123 - 29 - \pi - \phi = -152 - \pi - 2\cos\left(\frac{\pi}{5}\right) + 2\left(\frac{981877}{13981} + \frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}\right)$$

Series representations:

$$2\left(\frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881} + \frac{981877}{13981}\right) - 123 - 29 - \pi - \phi = \frac{171852156284355605422550669156180445807236282}{99114328581700847035030008052157320086305} - \phi - 4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$2\left(\frac{35621931}{69905} + \frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881} + \frac{981877}{13981}\right) - 123 - 29 - \pi - \phi = \frac{171852156284355605422550669156180445807236282}{99114328581700847035030008052157320086305} - \phi + \sum_{k=0}^{\infty}\frac{4(-1)^k\,1195^{-1-2k}\left(5^{1+2k} - 4\times 239^{1+2k}\right)}{1+2k}$$

$$2\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-123-29-\pi-\phi=\frac{171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282}{99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305}-\phi-\sum_{k=0}^{\infty}\left(-\frac{1}{4}\right)^k\left(\frac{1}{1+2k}+\frac{2}{1+4k}+\frac{1}{3+4k}\right)$$

Integral representations:

$$2\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-123-29-\pi-\phi=\frac{171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282}{99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305}-\phi-4\int_0^1\sqrt{1-t^2}\,dt$$

$$2\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-123-29-\pi-\phi=\frac{171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282}{99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305}-\phi-2\int_0^1\frac{1}{\sqrt{1-t^2}}\,dt$$

$$2\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-123-29-\pi-\phi=\frac{171\,852\,156\,284\,355\,605\,422\,550\,669\,156\,180\,445\,807\,236\,282}{99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305}-\phi-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

1/7((((35621931/69905)+(514866125727319947395068128497011253285/1417843195503910264430727530965700881)+(981877/13981))))+5

Input:

$$\frac{1}{7}\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)+5$$

Exact result:

$$\frac{96\,927\,768\,614\,746\,596\,732\,163\,665\,471\,879\,685\,433\,197\,996}{693\,800\,300\,071\,905\,929\,245\,210\,056\,365\,101\,240\,604\,135}$$

Decimal approximation:

139.70557320990051124188191577913520699904935556863949 68228...

139.705573… result practically equal to the rest mass of Pion meson 139.57 MeV

Mixed fraction:

$$139\frac{489526904751672567079467637130612989223231}{693800300071905929245210056365101240604135}$$

Continued fraction:

$$139+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{34+\cfrac{1}{1+\cfrac{1}{3\,020\,096+\cfrac{1}{1+\cfrac{1}{20}}}}}}}}}}}}}}}}$$

1/7((((35621931/69905)+(514866125727319947395068128497011253285/14178431955039102644307275309657 00881)+(981877/13981))))-11+golden ratio

Where 11 is a Lucas number

Input:

$$\frac{1}{7}\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-11+\phi$$

ϕ is the golden ratio

Result:

$$\phi + \frac{85\,826\,963\,813\,596\,101\,864\,240\,304\,570\,038\,065\,583\,531\,836}{693\,800\,300\,071\,905\,929\,245\,210\,056\,365\,101\,240\,604\,135}$$

Decimal approximation:

125.3236071986504060900865026135008451167696647484452596849...

125.323607… result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$\left(172\,347\,727\,927\,264\,109\,657\,725\,819\,196\,441\,232\,407\,667\,807 + 693\,800\,300\,071\,905\,929\,245\,210\,056\,365\,101\,240\,604\,135\sqrt{5}\right) / 1\,387\,600\,600\,143\,811\,858\,490\,420\,112\,730\,202\,481\,208\,270$$

$$(693\,800\,300\,071\,905\,929\,245\,210\,056\,365\,101\,240\,604\,135\,\phi + 85\,826\,963\,813\,596\,101\,864\,240\,304\,570\,038\,065\,583\,531\,836) / 693\,800\,300\,071\,905\,929\,245\,210\,056\,365\,101\,240\,604\,135$$

$$\frac{172\,347\,727\,927\,264\,109\,657\,725\,819\,196\,441\,232\,407\,667\,807}{1\,387\,600\,600\,143\,811\,858\,490\,420\,112\,730\,202\,481\,208\,270} + \frac{\sqrt{5}}{2}$$

Alternative representations:

$$\frac{1}{7}\left(\frac{35\,621\,931}{69\,905} + \frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881} + \frac{981\,877}{13\,981}\right) - 11 + \phi = -11 + \frac{1}{7}\left(\frac{981\,877}{13\,981} + \frac{35\,621\,931}{69\,905} + \frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}\right) + 2\sin(54\,°)$$

$$\frac{1}{7}\left(\frac{35\,621\,931}{69\,905} + \frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881} + \frac{981\,877}{13\,981}\right) - 11 + \phi = -11 - 2\cos(216\,°) + \frac{1}{7}\left(\frac{981\,877}{13\,981} + \frac{35\,621\,931}{69\,905} + \frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}\right)$$

$$\frac{1}{7}\left(\frac{35\,621\,931}{69\,905} + \frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881} + \frac{981\,877}{13\,981}\right) - 11 + \phi = -11 + \frac{1}{7}\left(\frac{981\,877}{13\,981} + \frac{35\,621\,931}{69\,905} + \frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}\right) - 2\sin(666\,°)$$

1/2((((35621931/69905)+(514866125727319947395068128497011253285/1417843195503910264430727530965700881)+(981877/13981))))-7-1/golden ratio

Where 7 is a Lucas number

Input:

$$\frac{1}{2}\left(\frac{35\,621\,931}{69\,905}+\frac{514\,866\,125\,727\,319\,947\,395\,068\,128\,497\,011\,253\,285}{1\,417\,843\,195\,503\,910\,264\,430\,727\,530\,965\,700\,881}+\frac{981\,877}{13\,981}\right)-7-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{92\,071\,166\,514\,243\,255\,227\,447\,195\,077\,323\,976\,748\,969\,051}{198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610}-\frac{1}{\phi}$$

Decimal approximation:

463.85147224590189449838211839260758637895243531043247601 77...

463.8514722459… result very near to Holographic Dark Energy model, where

$\chi^2_{\text{HDE}} = 465.912.$

Alternate forms:

$$\left(92\,170\,280\,842\,824\,956\,074\,482\,225\,085\,376\,134\,069\,055\,356-99\,114\,328\,581\,700\,847\,035\,030\,008\,052\,157\,320\,086\,305\sqrt{5}\right)/198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610$$

$$-((198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610-92\,071\,166\,514\,243\,255\,227\,447\,195\,077\,323\,976\,748\,969\,051\,\phi)/(198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610\,\phi))$$

$$(92\,071\,166\,514\,243\,255\,227\,447\,195\,077\,323\,976\,748\,969\,051\,\phi-198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610)/(198\,228\,657\,163\,401\,694\,070\,060\,016\,104\,314\,640\,172\,610\,\phi)$$

Alternative representations:

$$\frac{1}{2}\left(\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}+\frac{981877}{13981}\right)-7-\frac{1}{\phi}=-7+\frac{1}{2}\left(\frac{981877}{13981}+\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}\right)-\frac{1}{2\sin(54°)}$$

$$\frac{1}{2}\left(\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}+\frac{981877}{13981}\right)-7-\frac{1}{\phi}=-7+\frac{1}{2}\left(\frac{981877}{13981}+\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}\right)--\frac{1}{2\cos(216°)}$$

$$\frac{1}{2}\left(\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}+\frac{981877}{13981}\right)-7-\frac{1}{\phi}=-7+\frac{1}{2}\left(\frac{981877}{13981}+\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}\right)--\frac{1}{2\sin(666°)}$$

And:

1/10^52((((1+1/((((35621931/69905)+(514866125727319947395068128497011253285/1417843195503910264430727530965700881)+(981877/13981))))+(7+3)/10^2+(47-2)/10^4))))

Where 2, 3, 7 and 47 are Lucas numbers

Input:

$$\frac{1}{10^{52}}\left(1+\frac{1}{\frac{35621931}{69905}+\frac{514866125727319947395068128497011253285}{1417843195503910264430727530965700881}+\frac{981877}{13981}}+\frac{7+3}{10^2}+\frac{47-2}{10^4}\right)$$

Exact result:

206648645212844432886906251970933996559634312089 / 1869175342287741341718752303801083584603546420000000000000000000000000000000000000000000000000000000000000000

Decimal approximation:

$1.1055605139746856682141664262726504850514268403606160\ldots \times 10^{-52}$

1.1055605…*10^{-52} result practically equal to the value of Cosmological Constant 1.1056*10^{-52} m^{-2}

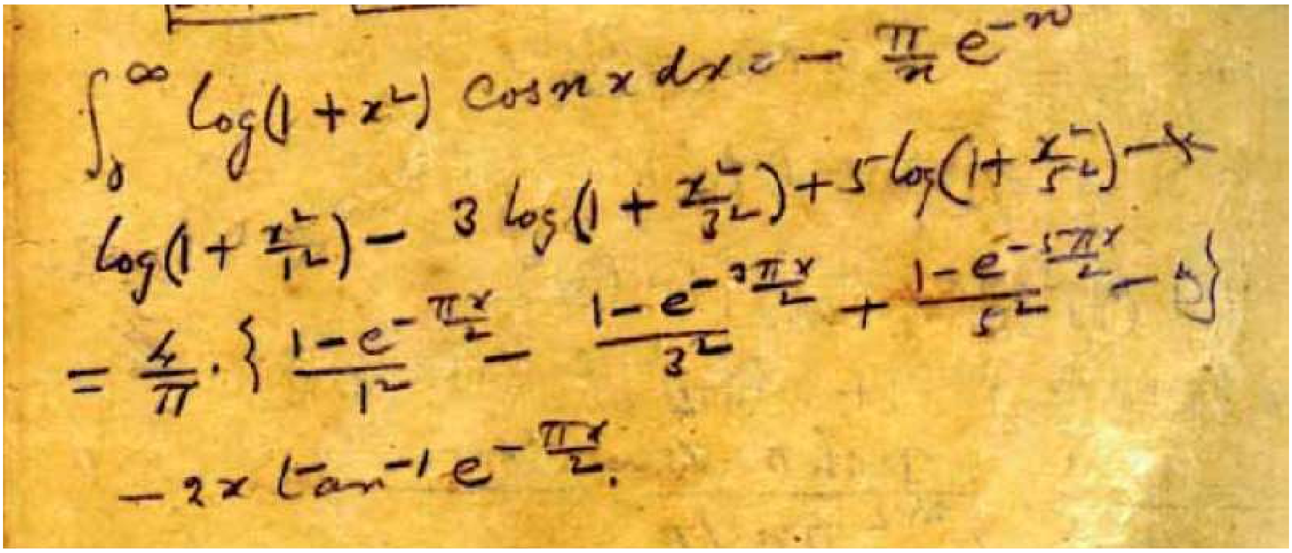
Alternate form:

206 648 645 212 844 432 886 906 251 970 933 996 559 634 312 089 /
1 869 175 342 287 741 341 718 752 303 801 083 584 603 546 420 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Continued fraction:

$$\cfrac{1}{9\,045\,185\,562\,975\,861\,517\,070\,790\,391\,337\,765\,558\,947\,244\,523\,684\,128 + \cfrac{1}{3}}$$

Page 324



$$\int_0^\infty \log(1+x^2)\cos nx\,dx = -\frac{\pi}{n}e^{-n}$$

$$\log\left(1+\frac{x^2}{1^2}\right) - 3\log\left(1+\frac{x^2}{3^2}\right) + 5\log\left(1+\frac{x^2}{5^2}\right) - \&c$$

$$= \frac{4}{\pi}\cdot\left\{\frac{1-e^{-\frac{\pi x}{2}}}{1^2} - \frac{1-e^{-\frac{3\pi x}{2}}}{3^2} + \frac{1-e^{-\frac{5\pi x}{2}}}{5^2} - \&c\right\}$$

$$-2x\tan^{-1}e^{-\frac{\pi x}{2}}.$$

integrate [ln(1+x^2) cos2x] dx – Pi/2*e^(-2)

Input:

$$\int \log(1+x^2)\cos(2x)\,dx - \frac{\frac{\pi}{2}}{e^2}$$

log(x) is the natural logarithm

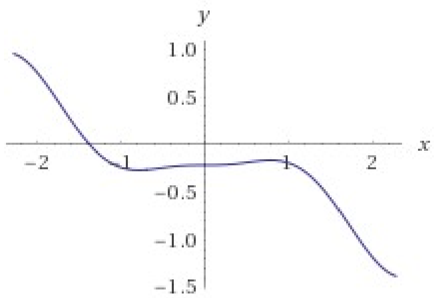
Exact result:

$$-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left(e^4-1\right)\text{Ci}(2i-2x)+i\left(e^4-1\right)\text{Ci}(2x+2i)+e^4\,\text{Si}(2i-2x)+\text{Si}(2i-2x)-e^4\,\text{Si}(2x+2i)-\text{Si}(2x+2i)+2e^2\log\left(x^2+1\right)\sin(2x)\right)$$

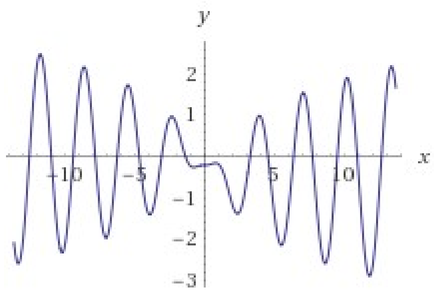
Ci(x) is the cosine integral

Si(x) is the sine integral

Plots:



(x from −2.3 to 2.3)



(x from −13.7 to 13.7)

Series expansion of the integral at x = 0:

$$-\frac{\pi}{2e^2}+\frac{x^3}{3}-\frac{x^5}{2}+\frac{2x^7}{7}+O\left(x^9\right)$$

(Taylor series)

Series expansion of the integral at x = -i:

$$\frac{1}{4e^2}\,i\left(-e^4\,\text{Ci}(4i)+\text{Ci}(4i)+e^4\,\text{Shi}(4)+\text{Shi}(4)-\left(e^4-1\right)\log(1-ix)+\left(e^4-1\right)\log(x+i)+2i\pi+e^4\gamma-\gamma\right)+\frac{\left(1+e^4\right)(x+i)(-1+\log(2-2ix))}{2e^2}+\frac{i(x+i)^2\left(4\left(e^4-1\right)\log(2-2ix)-e^4+3\right)}{8e^2}+\frac{(x+i)^3\left(-48\left(1+e^4\right)\log(2-2ix)-5e^4+43\right)}{144e^2}+O\left((x+i)^4\right)$$

(generalized Puiseux series)

Series expansion of the integral at x = i:

$$\frac{1}{2e^2}\Bigg(\bigg(-\frac{1}{2}i\left(-e^4\log(ix+1)+\log(2ix+2)+e^4\log(x-i)-\log(2(x-i))+e^4\,\mathrm{Shi}(4)+\mathrm{Shi}(4)-e^4\,\mathrm{Ci}(4i)+\mathrm{Ci}(4i)+ie^4\pi-3i\pi+e^4\gamma-\gamma\right)+\left(1+e^4\right)(\log(2ix+2)-1)(x-i)-\frac{1}{4}i\left(4\left(-1+e^4\right)\log(2ix+2)-e^4+3\right)(x-i)^2+\frac{1}{72}\left(-48\left(1+e^4\right)\log(2ix+2)-5e^4+43\right)(x-i)^3+O\left((x-i)^4\right)\bigg)+\pi\left\lceil\frac{\arg(x-i)}{2\pi}\right\rceil+e^4\pi\left\lfloor-\frac{\arg(x-i)}{2\pi}\right\rfloor\Bigg)$$

Series expansion of the integral at x = ∞:

$$\sin(2x)\left(\log(x)+\frac{1}{2x^2}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\left(-\frac{i\left(-8i\pi-2\log(2)+2e^4\log(2)+\log(4)-e^4\log(4)\right)}{8e^2}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2-2ix)\left(\frac{i}{16e^2x^2}+\frac{1}{8e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2-2ix)\left(\frac{ie^2}{16x^2}+\frac{e^2}{8x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2-2ix)\left(\frac{1}{8e^2x}-\frac{i}{8e^2x^2}-\frac{3}{16e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2-2ix)\left(-\frac{e^2}{8x}+\frac{ie^2}{8x^2}+\frac{3e^2}{16x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2+2ix)\left(-\frac{i}{16e^2x^2}+\frac{1}{8e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2+2ix)\left(-\frac{ie^2}{16x^2}+\frac{e^2}{8x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2+2ix)\left(\frac{1}{8e^2x}+\frac{i}{8e^2x^2}-\frac{3}{16e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\sinh(2+2ix)\left(-\frac{e^2}{8x}-\frac{ie^2}{8x^2}+\frac{3e^2}{16x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2+2ix)\left(-\frac{i}{16e^2x^2}+\frac{1}{8e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2-2ix)\left(\frac{i}{16e^2x^2}+\frac{1}{8e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2-2ix)\left(-\frac{ie^2}{16x^2}-\frac{e^2}{8x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+\cosh(2+2ix)\left(\frac{ie^2}{16x^2}-\frac{e^2}{8x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2-2ix)\left(\frac{1}{8e^2x}-\frac{i}{8e^2x^2}-\frac{3}{16e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2+2ix)\left(\frac{1}{8e^2x}+\frac{i}{8e^2x^2}-\frac{3}{16e^2x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2-2ix)\left(\frac{e^2}{8x}-\frac{ie^2}{8x^2}-\frac{3e^2}{16x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)+$$
$$\cosh(2+2ix)\left(\frac{e^2}{8x}+\frac{ie^2}{8x^2}-\frac{3e^2}{16x^3}+O\left(\left(\frac{1}{x}\right)^4\right)\right)$$

Indefinite integral:

$$\int \log(1+x^2)\cos(2x)\,dx - \frac{\pi}{2e^2} = -\frac{\pi}{2e^2} + \left(\text{constant} + \frac{1}{4e^2}\left(-i\left(e^4-1\right)\text{Ci}(2i-2x) + i\left(e^4-1\right)\text{Ci}(2x+2i) + e^4\,\text{Si}(2i-2x) + \text{Si}(2i-2x) - e^4\,\text{Si}(2x+2i) - \text{Si}(2x+2i) + 2e^2\log\left(x^2+1\right)\sin(2x)\right)\right)$$

From

$$-\frac{\pi}{2e^2} + \frac{1}{4e^2}\left(-i\left(e^4-1\right)\text{Ci}(2i-2x) + i\left(e^4-1\right)\text{Ci}(2x+2i) + e^4\,\text{Si}(2i-2x) + \text{Si}(2i-2x) - e^4\,\text{Si}(2x+2i) - \text{Si}(2x+2i) + 2e^2\log\left(x^2+1\right)\sin(2x)\right)$$

For x = 2, we obtain:

-π/(2 e^2) + (-i (e^4 - 1) Ci(2 i - 4) + i (e^4 - 1) Ci(4 + 2 i) + e^4 Si(2 i - 4) + Si(2 i - 4) - e^4 Si(4 + 2 i) - Si(4 + 2 i) + 2 e^2 log(4 + 1) sin(4))/(4 e^2)

Input:

$$-\frac{\pi}{2e^2} + \frac{1}{4e^2}\left(-i\left(e^4-1\right)\text{Ci}(2i-4) + i\left(e^4-1\right)\text{Ci}(4+2i) + e^4\,\text{Si}(2i-4) + \text{Si}(2i-4) - e^4\,\text{Si}(4+2i) - \text{Si}(4+2i) + 2e^2\log(4+1)\sin(4)\right)$$

$\text{Ci}(x)$ is the cosine integral

$\text{Si}(x)$ is the sine integral

$\log(x)$ is the natural logarithm

i is the imaginary unit

Exact result:

$$-\frac{\pi}{2e^2} + \frac{1}{4e^2}\left(-i\left(e^4-1\right)\text{Ci}(-4+2i) + i\left(e^4-1\right)\text{Ci}(4+2i) + \text{Si}(-4+2i) + e^4\,\text{Si}(-4+2i) - \text{Si}(4+2i) - e^4\,\text{Si}(4+2i) + 2e^2\log(5)\sin(4)\right)$$

Decimal approximation:

−1.1832133240279660145427539298108565895803770920587460814 1...

-1.18321332...

Alternate forms:

$$\frac{1}{4e^2}\left(e^4\left(-i\,\text{Ci}(-4+2i)+i\,\text{Ci}(4+2i)+\text{Si}(-4+2i)-\text{Si}(4+2i)\right)+ i\,\text{Ci}(-4+2i)-i\,\text{Ci}(4+2i)+\text{Si}(-4+2i)-\text{Si}(4+2i)-2\pi+e^2\log(25)\sin(4)\right)$$

$$\frac{1}{4e^2}\left(i\,\text{Ci}(-4+2i)-i\,e^4\,\text{Ci}(-4+2i)-i\,\text{Ci}(4+2i)+i\,e^4\,\text{Ci}(4+2i)+\text{Si}(-4+2i)+ e^4\,\text{Si}(-4+2i)-\text{Si}(4+2i)-e^4\,\text{Si}(4+2i)-2\pi+2e^2\log(5)\sin(4)\right)$$

$$\frac{\frac{1}{4}i\,\text{Ci}(-4+2i)-\frac{1}{4}i\,\text{Ci}(4+2i)+\frac{1}{4}\text{Si}(-4+2i)-\frac{\text{Si}(4+2i)}{4}-\frac{\pi}{2}}{e^2}+ e^2\left(-\frac{1}{4}i\,\text{Ci}(-4+2i)+\frac{1}{4}i\,\text{Ci}(4+2i)+\frac{1}{4}\text{Si}(-4+2i)-\frac{\text{Si}(4+2i)}{4}\right)+\frac{1}{2}\log(5)\sin(4)$$

Expanded form:

$$\frac{i\,\text{Ci}(-4+2i)}{4e^2}-\frac{1}{4}i\,e^2\,\text{Ci}(-4+2i)-\frac{i\,\text{Ci}(4+2i)}{4e^2}+\frac{1}{4}i\,e^2\,\text{Ci}(4+2i)+\frac{\text{Si}(-4+2i)}{4e^2}+ \frac{1}{4}e^2\,\text{Si}(-4+2i)-\frac{\text{Si}(4+2i)}{4e^2}-\frac{1}{4}e^2\,\text{Si}(4+2i)-\frac{\pi}{2e^2}+\frac{1}{2}\log(5)\sin(4)$$

Alternative representations:

$$-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left(\left(e^4-1\right)\text{Ci}(2i-4)\right)+i\left(e^4-1\right)\text{Ci}(4+2i)+e^4\,\text{Si}(2i-4)+ \text{Si}(2i-4)-e^4\,\text{Si}(4+2i)-\text{Si}(4+2i)+2e^2\log(4+1)\sin(4)\right)=$$
$$-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left((\text{Chi}(i(-4+2i))+\log(-4+2i)-\log(i(-4+2i)))\left(-1+e^4\right)\right)+ i\,(\text{Chi}(i(4+2i))+\log(4+2i)-\log(i(4+2i)))\left(-1+e^4\right)+ \frac{2\log(a)\log_a(5)\,e^2\left(-e^{-4i}+e^{4i}\right)}{2i}-i\,\text{Shi}(i(-4+2i))- i\left(e^4\,\text{Shi}(i(-4+2i))\right)+i\,\text{Shi}(i(4+2i))+i\,e^4\,\text{Shi}(i(4+2i))\right)$$

$$-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left(\left(e^4-1\right)\text{Ci}(2i-4)\right)+i\left(e^4-1\right)\text{Ci}(4+2i)+e^4\,\text{Si}(2i-4)+\text{Si}(2i-4)-e^4\,\text{Si}(4+2i)-\text{Si}(4+2i)+2e^2\log(4+1)\sin(4)\right)=-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left(\left(\log(-4+2i)+\frac{1}{2}(-\Gamma(0,-i(-4+2i))-\Gamma(0,i(-4+2i))-\log(-i(-4+2i))-\log(i(-4+2i)))\right)\left(-1+e^4\right)\right)+i\left(\log(4+2i)+\frac{1}{2}(-\Gamma(0,-i(4+2i))-\Gamma(0,i(4+2i))-\log(-i(4+2i))-\log(i(4+2i)))\right)\left(-1+e^4\right)+\frac{2\log(a)\log_a(5)\,e^2\left(-e^{-4i}+e^{4i}\right)}{2i}-i\,\text{Shi}(i(-4+2i))-i\left(e^4\,\text{Shi}(i(-4+2i))\right)+i\,\text{Shi}(i(4+2i))+i\,e^4\,\text{Shi}(i(4+2i))\right)$$

$$-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left(\left(e^4-1\right)\text{Ci}(2i-4)\right)+i\left(e^4-1\right)\text{Ci}(4+2i)+e^4\,\text{Si}(2i-4)+\text{Si}(2i-4)-e^4\,\text{Si}(4+2i)-\text{Si}(4+2i)+2e^2\log(4+1)\sin(4)\right)=-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(\frac{1}{2}i(\Gamma(0,-i(-4+2i))-\Gamma(0,i(-4+2i))+\log(-i(-4+2i))-\log(i(-4+2i)))-\frac{1}{2}i(\Gamma(0,-i(4+2i))-\Gamma(0,i(4+2i))+\log(-i(4+2i))-\log(i(4+2i)))+2\cos\left(-4+\frac{\pi}{2}\right)\log(a)\log_a(5)\,e^2-i\left(\left(\log(-4+2i)+\frac{1}{2}(-\Gamma(0,-i(-4+2i))-\Gamma(0,i(-4+2i))-\log(-i(-4+2i))-\log(i(-4+2i)))\right)\left(-1+e^4\right)\right)+i\left(\log(4+2i)+\frac{1}{2}(-\Gamma(0,-i(4+2i))-\Gamma(0,i(4+2i))-\log(-i(4+2i))-\log(i(4+2i)))\right)\left(-1+e^4\right)+\frac{1}{2}i(\Gamma(0,-i(-4+2i))-\Gamma(0,i(-4+2i))+\log(-i(-4+2i))-\log(i(-4+2i)))\,e^4-\frac{1}{2}i(\Gamma(0,-i(4+2i))-\Gamma(0,i(4+2i))+\log(-i(4+2i))-\log(i(4+2i)))\,e^4\right)$$

Series representations:

$$-\frac{\pi}{2 e^2} + \frac{1}{4 e^2} \left(-i \left(\left(e^4 - 1\right) \text{Ci}(2 i - 4)\right) + i \left(e^4 - 1\right) \text{Ci}(4 + 2 i) + e^4 \text{Si}(2 i - 4) + \text{Si}(2 i - 4) - e^4 \text{Si}(4 + 2 i) - \text{Si}(4 + 2 i) + 2 e^2 \log(4 + 1) \sin(4)\right) = \frac{1}{4 e^2} \left(-2 \pi + i \log(-4 + 2 i) - i e^4 \log(-4 + 2 i) - i \log(4 + 2 i) + i e^4 \log(4 + 2 i) + 4 e^2 \sum_{k=1}^{\infty} - \frac{i (-1)^k 2^{-3+2 k} \left((-2 + i)^{2 k} - (2 + i)^{2 k}\right) \left(-1 + e^4\right)}{e^2 k (2 k)!} + 4 e^2 \sum_{k=0}^{\infty} \left((-1)^k 2^{-1+2 k} \left((-2 + i)^{1+2 k} - (2 + i)^{1+2 k} + \left((-2 + i)^{1+2 k} - (2 + i)^{1+2 k}\right) e^4 + 4^{1+k} e^2 (1 + 2 k) \log(4)\right)\right) \Big/ \left(e^2 (1 + 2 k) (1 + 2 k)!\right) - 2 e^2 \sum_{k_1=1}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} 4^{1-k_1+2 k_2}}{(1 + 2 k_2)! k_1}\right)$$

$$-\frac{\pi}{2 e^2} + \frac{1}{4 e^2} \left(-i \left(\left(e^4 - 1\right) \text{Ci}(2 i - 4)\right) + i \left(e^4 - 1\right) \text{Ci}(4 + 2 i) + e^4 \text{Si}(2 i - 4) + \text{Si}(2 i - 4) - e^4 \text{Si}(4 + 2 i) - \text{Si}(4 + 2 i) + 2 e^2 \log(4 + 1) \sin(4)\right) = \frac{1}{4 e^2} \left(-2 \pi + i \log(-4 + 2 i) - i e^4 \log(-4 + 2 i) - i \log(4 + 2 i) + i e^4 \log(4 + 2 i) + 4 e^2 \sum_{k=1}^{\infty} - \frac{i (-1)^k 2^{-3+2 k} \left((-2 + i)^{2 k} - (2 + i)^{2 k}\right) \left(-1 + e^4\right)}{e^2 k (2 k)!} + 4 e^2 \sum_{k=0}^{\infty} \left(\frac{(-2 + i)^{1+2 k} (-1)^k 2^{-1+2 k}}{e^2 (1 + 2 k)^2 (2 k)!} + \frac{(-1)^{1+k} 2^{-1+2 k} (2 + i)^{1+2 k}}{e^2 (1 + 2 k)^2 (2 k)!} + \frac{(-2 + i)^{1+2 k} (-1)^k 2^{-1+2 k} e^2}{(1 + 2 k)^2 (2 k)!} + \frac{(-1)^{1+k} 2^{-1+2 k} (2 + i)^{1+2 k} e^2}{(1 + 2 k)^2 (2 k)!} + \frac{(-1)^k 2^{1+4 k} \log(4)}{(1 + 2 k)!}\right) - 2 e^2 \sum_{k_1=1}^{\infty} \sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2} 4^{1-k_1+2 k_2}}{(1 + 2 k_2)! k_1}\right)$$

$$-\frac{\pi}{2e^2}+\frac{1}{4e^2}\left(-i\left(\left(e^4-1\right)\operatorname{Ci}(2i-4)\right)+i\left(e^4-1\right)\operatorname{Ci}(4+2i)+e^4\operatorname{Si}(2i-4)+\operatorname{Si}(2i-4)-e^4\operatorname{Si}(4+2i)-\operatorname{Si}(4+2i)+2e^2\log(4+1)\sin(4)\right)=\frac{1}{4e^2}$$

$$\left(-2\pi+i\log(-4+2i)-ie^4\log(-4+2i)-i\log(4+2i)+ie^4\log(4+2i)+4e^2\sum_{k=1}^{\infty}-\frac{i(-1)^k 2^{-3+2k}\left((-2+i)^{2k}-(2+i)^{2k}\right)\left(-1+e^4\right)}{e^2 k(2k)!}+4e^2\sum_{k=0}^{\infty}\left(\frac{(-2+i)^{1+2k}(-1)^k 2^{-1+2k}}{e^2(1+2k)^2(2k)!}+\frac{(-1)^{1+k}2^{-1+2k}(2+i)^{1+2k}}{e^2(1+2k)^2(2k)!}+\frac{(-2+i)^{1+2k}(-1)^k 2^{-1+2k}e^2}{(1+2k)^2(2k)!}+\frac{(-1)^{1+k}2^{-1+2k}(2+i)^{1+2k}e^2}{(1+2k)^2(2k)!}+\frac{(-1)^k\left(4-\frac{\pi}{2}\right)^{2k}\log(4)}{2(2k)!}\right)-2e^2\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1+k_2}4^{-k_1}\left(4-\frac{\pi}{2}\right)^{2k_2}}{(2k_2)!\,k_1}\right)$$

ln(1+4) - 3 ln(1+4/9) + 5 ln(1+4/25)

Input:

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

log(x) is the natural logarithm

Exact result:

$$5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)$$

Decimal approximation:

1.248363597649514704720535259613067685211291893852936258545...

1.2483635…

Property:

$5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)$ is a transcendental number

Alternate forms:

$$5\log\left(\frac{29}{25}\right)+\log\left(\frac{3645}{2197}\right)$$

$6 \log(3) - 9 \log(5) - 3 \log(13) + 5 \log(29)$

$-9 \log(5) - 3 \log(13) + 5 \log(29) + \log(729)$

Alternative representations:

$$\log(1+4) - 3 \log\left(1 + \frac{4}{9}\right) + 5 \log\left(1 + \frac{4}{25}\right) = \log(a) \log_a(5) - 3 \log(a) \log_a\left(1 + \frac{4}{9}\right) + 5 \log(a) \log_a\left(1 + \frac{4}{25}\right)$$

$$\log(1+4) - 3 \log\left(1 + \frac{4}{9}\right) + 5 \log\left(1 + \frac{4}{25}\right) = \log_e(5) - 3 \log_e\left(1 + \frac{4}{9}\right) + 5 \log_e\left(1 + \frac{4}{25}\right)$$

$$\log(1+4) - 3 \log\left(1 + \frac{4}{9}\right) + 5 \log\left(1 + \frac{4}{25}\right) = -\text{Li}_1(-4) + 3 \text{Li}_1\left(-\frac{4}{9}\right) - 5 \text{Li}_1\left(-\frac{4}{25}\right)$$

Series representations:

$$\log(1+4) - 3 \log\left(1 + \frac{4}{9}\right) + 5 \log\left(1 + \frac{4}{25}\right) = 6 i \pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2 \pi} \right\rfloor + 3 \log(z_0) + \sum_{k=1}^{\infty} \frac{(-1)^{1+k} \left(5 \left(\frac{29}{25} - z_0\right)^k - 3 \left(\frac{13}{9} - z_0\right)^k + (5 - z_0)^k\right) z_0^{-k}}{k}$$

$$\log(1+4) - 3 \log\left(1 + \frac{4}{9}\right) + 5 \log\left(1 + \frac{4}{25}\right) = 10 i \pi \left\lfloor \frac{\arg\left(\frac{29}{25} - x\right)}{2 \pi} \right\rfloor - 6 i \pi \left\lfloor \frac{\arg\left(\frac{13}{9} - x\right)}{2 \pi} \right\rfloor + 2 i \pi \left\lfloor \frac{\arg(5 - x)}{2 \pi} \right\rfloor + 3 \log(x) + \sum_{k=1}^{\infty} \frac{(-1)^{1+k} \left(5 \left(\frac{29}{25} - x\right)^k - 3 \left(\frac{13}{9} - x\right)^k + (5 - x)^k\right) x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(1+4) - 3 \log\left(1 + \frac{4}{9}\right) + 5 \log\left(1 + \frac{4}{25}\right) = 5 \left\lfloor \frac{\arg\left(\frac{29}{25} - z_0\right)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) - 3 \left\lfloor \frac{\arg\left(\frac{13}{9} - z_0\right)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \left\lfloor \frac{\arg(5 - z_0)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + 3 \log(z_0) + 5 \left\lfloor \frac{\arg\left(\frac{29}{25} - z_0\right)}{2 \pi} \right\rfloor \log(z_0) - 3 \left\lfloor \frac{\arg\left(\frac{13}{9} - z_0\right)}{2 \pi} \right\rfloor \log(z_0) + \left\lfloor \frac{\arg(5 - z_0)}{2 \pi} \right\rfloor \log(z_0) + \sum_{k=1}^{\infty} \frac{(-1)^{1+k} \left(5 \left(\frac{29}{25} - z_0\right)^k - 3 \left(\frac{13}{9} - z_0\right)^k + (5 - z_0)^k\right) z_0^{-k}}{k}$$

Integral representations:

$$\log(1+4)-3\log\left(1+\frac{4}{9}\right)+5\log\left(1+\frac{4}{25}\right)=\int_1^{\frac{29}{25}}5\left(\frac{1}{t}+5\left(\frac{3}{16-25t}+\frac{1}{-24+25t}\right)\right)dt$$

$$\log(1+4)-3\log\left(1+\frac{4}{9}\right)+5\log\left(1+\frac{4}{25}\right)=\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{i\,2^{-1-2s}\left(-1+3^{1+2s}-5^{1+2s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{\pi\,\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

4/Pi((((((1-e^((-2Pi)/2))/(1)^2))-((1-e^((-6Pi)/2))/(3)^2))+((1-e^((-10Pi)/2))/(5)^2))))-2*2 tan^-1(e^((-2Pi)/2))

Input:

$$\frac{4}{\pi}\left(\left(\frac{1-e^{1/2(-2\pi)}}{1^2}-\frac{1-e^{1/2(-6\pi)}}{3^2}\right)+\frac{1-e^{1/2(-10\pi)}}{5^2}\right)-(2\times 2)\tan^{-1}\left(e^{1/2(-2\pi)}\right)$$

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

Exact Result:

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

(result in radians)

Decimal approximation:

0.954939611254082249939094312747766773216649377749888300192...

(result in radians)

0.954939611254…. 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:

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

Alternate forms:

$$-\frac{4\left(-209+9 e^{-5 \pi}-25 e^{-3 \pi}+225 e^{-\pi}+225 \pi \tan ^{-1}\left(e^{-\pi}\right)\right)}{225 \pi}$$

$$\frac{836-4 e^{-5 \pi}\left(9-25 e^{2 \pi}+225 e^{4 \pi}\right)}{225 \pi}-4 \cot ^{-1}\left(e^\pi\right)$$

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

$\cot^{-1}(x)$ is the inverse cotangent function

Continued fraction:

$$\cfrac{1}{1+\cfrac{1}{21+\cfrac{1}{5+\cfrac{1}{5+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{15+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{53+\cfrac{1}{3+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Alternative representations:

$$\frac{\left(\left(\frac{1-e^{-(2 \pi)/2}}{1^2}-\frac{1-e^{-(6 \pi)/2}}{3^2}\right)+\frac{1-e^{-(10 \pi)/2}}{5^2}\right)4}{\pi}-\tan ^{-1}\left(e^{-(2 \pi)/2}\right) 2 \times 2=$$

$$-4 \operatorname{sc}^{-1}\left(e^{-\pi} \mid 0\right)+\frac{4\left(-\frac{1}{9}\left(1-e^{-3 \pi}\right)+\frac{1}{1}\left(1-e^{-\pi}\right)+\frac{1-e^{-5 \pi}}{5^2}\right)}{\pi}$$

$$\frac{\left(\left(\frac{1-e^{-(2 \pi)/2}}{1^2}-\frac{1-e^{-(6 \pi)/2}}{3^2}\right)+\frac{1-e^{-(10 \pi)/2}}{5^2}\right)4}{\pi}-\tan ^{-1}\left(e^{-(2 \pi)/2}\right) 2 \times 2=$$

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

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = -4\cot^{-1}\left(\frac{1}{e^{-\pi}}\right)+\frac{4\left(-\frac{1}{9}\left(1-e^{-3\pi}\right)+\frac{1}{1}\left(1-e^{-\pi}\right)+\frac{1-e^{-5\pi}}{5^2}\right)}{\pi}$$

Series representations:

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = \frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}-4\sum_{k=0}^{\infty}\frac{e^{(-1-(2-i)k)\pi}}{1+2k}$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = \frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}-2i\log(2)+2i\log\left(i\left(-i+e^{-\pi}\right)\right)+2i\sum_{k=1}^{\infty}\frac{\left(\frac{1}{2}+\frac{ie^{-\pi}}{2}\right)^k}{k}$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = \frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}+2i\log(2)-2i\log\left(-i\left(i+e^{-\pi}\right)\right)-2i\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}i\left(i+e^{-\pi}\right)\right)^k}{k}$$

Integral representations:

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = \frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}-4e^{-\pi}\int_0^1\frac{1}{1+e^{-2\pi}t^2}\,dt$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = \frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}+\frac{ie^{-\pi}}{\pi^{3/2}}\int_{-i\infty+\gamma}^{i\infty+\gamma}\left(1+e^{-2\pi}\right)^{-s}\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)^2\,ds \quad \text{for } 0<\gamma<\frac{1}{2}$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2 = \frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}+\frac{ie^{-\pi}}{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{2\pi s}\,\Gamma\left(\frac{1}{2}-s\right)\Gamma(1-s)\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds \quad \text{for } 0<\gamma<\frac{1}{2}$$

Continued fraction representations:

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-\frac{4e^{-\pi}}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{e^{-2\pi}k^2}{1+2k}}=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-\frac{4e^{-\pi}}{1+\frac{e^{-2\pi}}{3+\frac{4e^{-2\pi}}{5+\frac{9e^{-2\pi}}{7+\frac{16e^{-2\pi}}{9+\ldots}}}}}$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-4\left(e^{-\pi}-\frac{e^{-3\pi}}{3+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{e^{-2\pi}\left(1+(-1)^{1+k}+k\right)^2}{3+2k}}\right)=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-4\left(e^{-\pi}-\frac{e^{-3\pi}}{3+\frac{9e^{-2\pi}}{5+\frac{4e^{-2\pi}}{7+\frac{25e^{-2\pi}}{9+\frac{16e^{-2\pi}}{11+\ldots}}}}}\right)$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-\frac{4e^{-\pi}}{1+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{e^{-2\pi}(-1+2k)^2}{1+2k-e^{-2\pi}(-1+2k)}}=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-\frac{4e^{-\pi}}{1+\frac{e^{-2\pi}}{3-e^{-2\pi}+\frac{9e^{-2\pi}}{5-3e^{-2\pi}+\frac{25e^{-2\pi}}{7-5e^{-2\pi}+\frac{49e^{-2\pi}}{9+\ldots-7e^{-2\pi}}}}}}$$

$$\frac{\left(\left(\frac{1-e^{-(2\pi)/2}}{1^2}-\frac{1-e^{-(6\pi)/2}}{3^2}\right)+\frac{1-e^{-(10\pi)/2}}{5^2}\right)4}{\pi}-\tan^{-1}\left(e^{-(2\pi)/2}\right)2\times 2=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-\frac{4e^{-\pi}}{1+e^{-2\pi}+\underset{k=1}{\overset{\infty}{\mathrm{K}}}\frac{2e^{-2\pi}\left(1-2\left\lfloor\frac{1+k}{2}\right\rfloor\right)\left\lfloor\frac{1+k}{2}\right\rfloor}{\left(1+\frac{1}{2}\left(1+(-1)^k\right)e^{-2\pi}\right)(1+2k)}}=$$

$$\frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-\frac{4e^{-\pi}}{1+e^{-2\pi}+-\frac{2e^{-2\pi}}{3-\frac{2e^{-2\pi}}{5\left(1+e^{-2\pi}\right)-\frac{12e^{-2\pi}}{7-\frac{12e^{-2\pi}}{9\left(1+e^{-2\pi}\right)+\ldots}}}}}$$

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

We obtain also:

(((5 log(29/25) - 3 log(13/9) + log(5))))x = (((4 (1 - e^(-π) + 1/25 (1 - e^(-5 π)) + 1/9 (-1 + e^(-3 π))))/π - 4 tan^(-1)(e^(-π))))

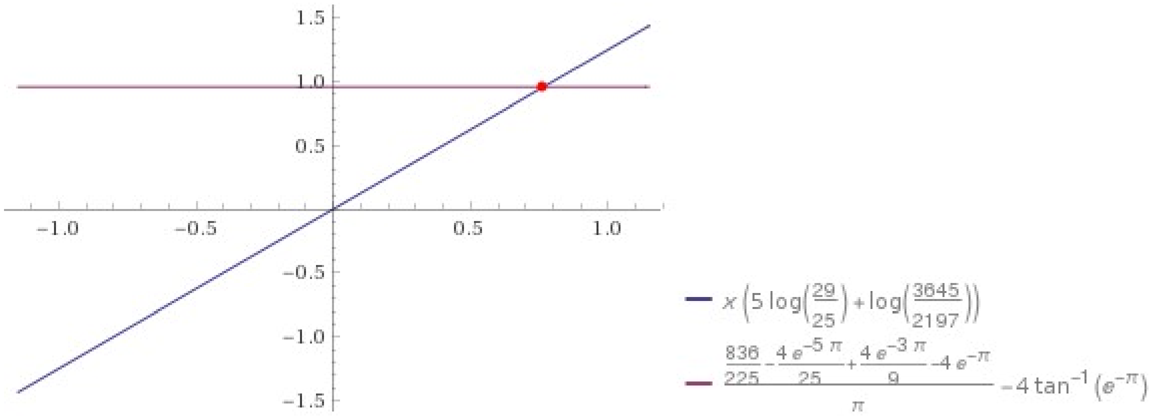
Input:

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)x = \frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(-1+e^{-3\pi}\right)\right)}{\pi}-4\tan^{-1}\left(e^{-\pi}\right)$$

log(x) is the natural logarithm

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

Plot:



Alternate forms:

$$x\left(5\log\left(\frac{29}{25}\right)+\log\left(\frac{3645}{2197}\right)\right)=\frac{836-4e^{-5\pi}\left(9-25e^{2\pi}+225e^{4\pi}\right)}{225\pi}-4\cot^{-1}\left(e^{\pi}\right)$$

$$x\left(5\log\left(\frac{29}{25}\right)+\log\left(\frac{3645}{2197}\right)\right)=\frac{\frac{836}{225}-\frac{4e^{-5\pi}}{25}+\frac{4e^{-3\pi}}{9}-4e^{-\pi}}{\pi}-4\tan^{-1}\left(e^{-\pi}\right)$$

$$x\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)= \frac{4\left(1-e^{-\pi}+\frac{1}{25}\left(1-e^{-5\pi}\right)+\frac{1}{9}\left(e^{-3\pi}-1\right)\right)}{\pi}-4\cot^{-1}\left(e^{\pi}\right)$$

$\cot^{-1}(x)$ is the inverse cotangent function

Expanded form:

$$x\log(5)-3x\log\left(\frac{13}{9}\right)+5x\log\left(\frac{29}{25}\right)=\frac{836}{225\pi}-\frac{4e^{-5\pi}}{25\pi}+\frac{4e^{-3\pi}}{9\pi}-\frac{4e^{-\pi}}{\pi}-4\tan^{-1}\left(e^{-\pi}\right)$$

Alternate forms assuming x>0:

$$x(-9\log(5)-3\log(13)+5\log(29)+\log(729))=\frac{\frac{836}{225}-\frac{4e^{-5\pi}}{25}+\frac{4e^{-3\pi}}{9}-4e^{-\pi}}{\pi}-4\tan^{-1}(e^{-\pi})$$

$$5x(\log(29)-2\log(5))-3x(\log(13)-2\log(3))+x\log(5)=\frac{4\left(1-e^{-\pi}+\frac{1}{25}(1-e^{-5\pi})+\frac{1}{9}(e^{-3\pi}-1)\right)}{\pi}-4\tan^{-1}(e^{-\pi})$$

Solution:

$x \approx 0.76495$

0.76495

Thence:

(((5 log(29/25) - 3 log(13/9) + log(5))))*0.76495

Input:

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\times 0.76495$$

log(x) is the natural logarithm

Result:

0.954935734021996273375973446841016125802377734202803590974...

0.954935734… 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:

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

Alternative representations:

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 = 0.76495\left(\log(a)\log_a(5)-3\log(a)\log_a\left(\frac{13}{9}\right)+5\log(a)\log_a\left(\frac{29}{25}\right)\right)$$

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 = 0.76495\left(\log_e(5)-3\log_e\left(\frac{13}{9}\right)+5\log_e\left(\frac{29}{25}\right)\right)$$

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 = 0.76495\left(-\text{Li}_1(-4)+3\,\text{Li}_1\left(1-\frac{13}{9}\right)-5\,\text{Li}_1\left(1-\frac{29}{25}\right)\right)$$

Series representations:

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 = 7.6495\,i\,\pi\left\lfloor\frac{\arg\left(\frac{29}{25}-x\right)}{2\pi}\right\rfloor - 4.5897\,i\,\pi\left\lfloor\frac{\arg\left(\frac{13}{9}-x\right)}{2\pi}\right\rfloor + 1.5299\,i\,\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor + 2.29485\log(x) + \sum_{k=1}^{\infty}\frac{(-1)^k\left(-3.82475\left(\frac{29}{25}-x\right)^k+2.29485\left(\frac{13}{9}-x\right)^k-0.76495(5-x)^k\right)x^{-k}}{k} \quad \text{for } x < 0$$

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 = 3.82475\left\lfloor\frac{\arg\left(\frac{29}{25}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) - 2.29485\left\lfloor\frac{\arg\left(\frac{13}{9}-z_0\right)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) + 0.76495\left\lfloor\frac{\arg(5-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) + 2.29485\log(z_0) + 3.82475\left\lfloor\frac{\arg\left(\frac{29}{25}-z_0\right)}{2\pi}\right\rfloor\log(z_0) - 2.29485\left\lfloor\frac{\arg\left(\frac{13}{9}-z_0\right)}{2\pi}\right\rfloor\log(z_0) + 0.76495\left\lfloor\frac{\arg(5-z_0)}{2\pi}\right\rfloor\log(z_0) + \sum_{k=1}^{\infty}\frac{(-1)^k\left(-3.82475\left(\frac{29}{25}-z_0\right)^k+2.29485\left(\frac{13}{9}-z_0\right)^k-0.76495(5-z_0)^k\right)z_0^{-k}}{k}$$

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 =$$
$$7.6495\, i\,\pi \left\lfloor\frac{\pi-\arg\left(\frac{29}{25\, z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor - 4.5897\, i\,\pi \left\lfloor\frac{\pi-\arg\left(\frac{13}{9\, z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor +$$
$$1.5299\, i\,\pi \left\lfloor\frac{\pi-\arg\left(\frac{5}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor + 2.29485\log(z_0) +$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(-3.82475\left(\frac{29}{25}-z_0\right)^k+2.29485\left(\frac{13}{9}-z_0\right)^k-0.76495\,(5-z_0)^k\right)z_0^{-k}}{k}$$

Integral representations:

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 = \int_1^{\frac{29}{25}}\frac{2.34993-4.40611\,t+2.29485\,t^2}{0.6144\,t-1.6\,t^2+t^3}\,dt$$

$$\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495 =$$
$$\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{4^{-s}\,(0.382475-1.14743\times 9^s+1.91238\times 25^s)\,\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi\,\Gamma(1-s)}\,ds \quad \text{for}$$
$$-1<\gamma<0$$

((((((5 log(29/25) - 3 log(13/9) + log(5))))*0.76495)))^1/64

Input:

$$\sqrt[64]{\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\times 0.76495}$$

log(x) is the natural logarithm

Result:

0.99927977...

0.99927977… 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 = $\boldsymbol{\phi}$**

2*log base 0.99927977 ((((((5 log(29/25) - 3 log(13/9) + log(5))))*0.76495)))-Pi+1/golden ratio

Input interpretation:

$$2 \log_{0.99927977}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) \times 0.76495\right) - \pi + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

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

ϕ is the golden ratio

Result:

125.476...

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

Alternative representations:

$$2 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) - \pi + \frac{1}{\phi} =$$

$$-\pi + \frac{1}{\phi} + \frac{2 \log\left(0.76495 \left(\log(5) - 3 \log\left(\frac{13}{9}\right) + 5 \log\left(\frac{29}{25}\right)\right)\right)}{\log(0.99928)}$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=$$
$$-\pi+2\log_{0.99928}\left(0.76495\left(\log(a)\log_a(5)-3\log(a)\log_a\left(\frac{13}{9}\right)+5\log(a)\log_a\left(\frac{29}{25}\right)\right)\right)+\frac{1}{\phi}$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=$$
$$-\pi+2\log_{0.99928}\left(0.76495\left(\log_e(5)-3\log_e\left(\frac{13}{9}\right)+5\log_e\left(\frac{29}{25}\right)\right)\right)+\frac{1}{\phi}$$

Series representations:

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+3.82475\log\left(\frac{29}{25}\right)-2.29485\log\left(\frac{13}{9}\right)+0.76495\log(5)\right)^k}{k}}{\log(0.99928)}$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-2775.89\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)-$$
$$2\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)\sum_{k=0}^{\infty}(-0.00072023)^k\,G(k)$$
$$\text{for}\left(G(0)=0\text{ and }\frac{(-1)^k\,k}{2(1+k)(2+k)}+G(k)=\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi-2775.89\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)-$$
$$2\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)\sum_{k=0}^{\infty}(-0.00072023)^k\,G(k)$$
$$\text{for}\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

Integral representations:

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=$$
$$\frac{1}{\phi}-\pi+2\log_{0.99928}\left(0.76495\int_1^{\frac{29}{25}}5\left(\frac{1}{t}+5\left(\frac{3}{16-25t}+\frac{1}{-24+25t}\right)\right)dt\right)$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)-\pi+\frac{1}{\phi}=\frac{1}{\phi}-\pi+2\log_{0.99928}\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\left(0.382475-1.14743\times 9^s+1.91238\times 25^s\right)\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)$$
for $-1<\gamma<0$

2*log base 0.99927977 ((((((5 log(29/25) - 3 log(13/9) + log(5))))*0.76495)))+11+1/golden ratio

Input interpretation:

$$2\log_{0.99927977}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\times 0.76495\right)+11+\frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

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

ϕ is the golden ratio

Result:

139.618...

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

Alternative representations:

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}+\frac{2\log\left(0.76495\left(\log(5)-3\log\left(\frac{13}{9}\right)+5\log\left(\frac{29}{25}\right)\right)\right)}{\log(0.99928)}$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=11+2\log_{0.99928}\left(0.76495\left(\log(a)\log_a(5)-3\log(a)\log_a\left(\frac{13}{9}\right)+5\log(a)\log_a\left(\frac{29}{25}\right)\right)\right)+\frac{1}{\phi}$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=11+2\log_{0.99928}\left(0.76495\left(\log_e(5)-3\log_e\left(\frac{13}{9}\right)+5\log_e\left(\frac{29}{25}\right)\right)\right)+\frac{1}{\phi}$$

Series representations:

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-\frac{2\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+3.82475\log\left(\frac{29}{25}\right)-2.29485\log\left(\frac{13}{9}\right)+0.76495\log(5)\right)^k}{k}}{\log(0.99928)}$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-2775.89\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)-$$
$$2\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)\sum_{k=0}^{\infty}(-0.00072023)^k\,G(k)$$
$$\text{for }\left(G(0)=0\text{ and }\frac{(-1)^k\,k}{2(1+k)(2+k)}+G(k)=\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}-2775.89\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)-$$
$$2\log\left(0.76495\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)\right)\sum_{k=0}^{\infty}(-0.00072023)^k\,G(k)$$
$$\text{for }\left(G(0)=0\text{ and }G(k)=\frac{(-1)^{1+k}\,k}{2(1+k)(2+k)}+\sum_{j=1}^{k}\frac{(-1)^{1+j}\,G(-j+k)}{1+j}\right)$$

Integral representations:

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=$$
$$11+\frac{1}{\phi}+2\log_{0.99928}\left(0.76495\int_1^{\frac{29}{25}}5\left(\frac{1}{t}+5\left(\frac{3}{16-25t}+\frac{1}{-24+25t}\right)\right)dt\right)$$

$$2\log_{0.99928}\left(\left(5\log\left(\frac{29}{25}\right)-3\log\left(\frac{13}{9}\right)+\log(5)\right)0.76495\right)+11+\frac{1}{\phi}=11+\frac{1}{\phi}+2\log_{0.99928}\left(\right.$$
$$\left.\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-s}\left(0.382475-1.14743\times 9^s+1.91238\times 25^s\right)\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)$$
$$\text{for }-1<\gamma<0$$

27*log base 0.99927977 ((((((5 log(29/25) - 3 log(13/9) + log(5))))*0.76495)))+1/golden ratio

Input interpretation:

$$27 \log_{0.99927977}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) \times 0.76495\right) + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

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

ϕ is the golden ratio

Result:

1728.61…

1728.61…

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

Alternative representations:

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = \frac{1}{\phi} + \frac{27 \log\left(0.76495 \left(\log(5) - 3 \log\left(\frac{13}{9}\right) + 5 \log\left(\frac{29}{25}\right)\right)\right)}{\log(0.99928)}$$

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = 27 \log_{0.99928}\left(0.76495 \left(\log(a) \log_a(5) - 3 \log(a) \log_a\left(\frac{13}{9}\right) + 5 \log(a) \log_a\left(\frac{29}{25}\right)\right)\right) + \frac{1}{\phi}$$

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = 27 \log_{0.99928}\left(0.76495 \left(\log_e(5) - 3 \log_e\left(\frac{13}{9}\right) + 5 \log_e\left(\frac{29}{25}\right)\right)\right) + \frac{1}{\phi}$$

Series representations:

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = \frac{1}{\phi} - \frac{27 \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1+3.82475 \log\left(\frac{29}{25}\right) - 2.29485 \log\left(\frac{13}{9}\right) + 0.76495 \log(5)\right)^k}{k}}{\log(0.99928)}$$

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = \frac{1}{\phi} - 37474.5 \log\left(0.76495 \left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right)\right) - 27 \log\left(0.76495 \left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right)\right) \sum_{k=0}^{\infty} (-0.00072023)^k G(k)$$

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

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = \frac{1}{\phi} - 37474.5 \log\left(0.76495 \left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right)\right) - 27 \log\left(0.76495 \left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right)\right) \sum_{k=0}^{\infty} (-0.00072023)^k G(k)$$

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

Integral representations:

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = \frac{1}{\phi} + 27 \log_{0.99928}\left(0.76495 \int_1^{\frac{29}{25}} 5 \left(\frac{1}{t} + 5 \left(\frac{3}{16 - 25 t} + \frac{1}{-24 + 25 t}\right)\right) dt\right)$$

$$27 \log_{0.99928}\left(\left(5 \log\left(\frac{29}{25}\right) - 3 \log\left(\frac{13}{9}\right) + \log(5)\right) 0.76495\right) + \frac{1}{\phi} = \frac{1}{\phi} + 27 \log_{0.99928}\left(\frac{1}{i \pi} \int_{-i \infty+\gamma}^{i \infty+\gamma} \frac{4^{-s} (0.382475 - 1.14743 \times 9^s + 1.91238 \times 25^s) \Gamma(-s)^2 \Gamma(1+s)}{\Gamma(1-s)} ds\right)$$

$$\text{for } -1 < \gamma < 0$$

Acknowledgments

We would like to thank Prof. **George E. Andrews** Evan Pugh Professor of Mathematics at Pennsylvania State University for his great availability and kindness towards me

References

MANUSCRIPT BOOK 1 OF SRINIVASA RAMANUJAN