On various Ramanujan equations (mock theta functions and taxicab numbers) linked to some sectors of Supersymmetric String Theory applied to the Black Hole Physics: Further new possible mathematical connections VIII.

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Abstract

In this research thesis, we have analyzed and deepened further Ramanujan expressions (mock theta functions and taxicab numbers) applied to some sectors of Supersymmetric String Theory concerning the Black Hole Physics. We have therefore described other new possible mathematical connections.

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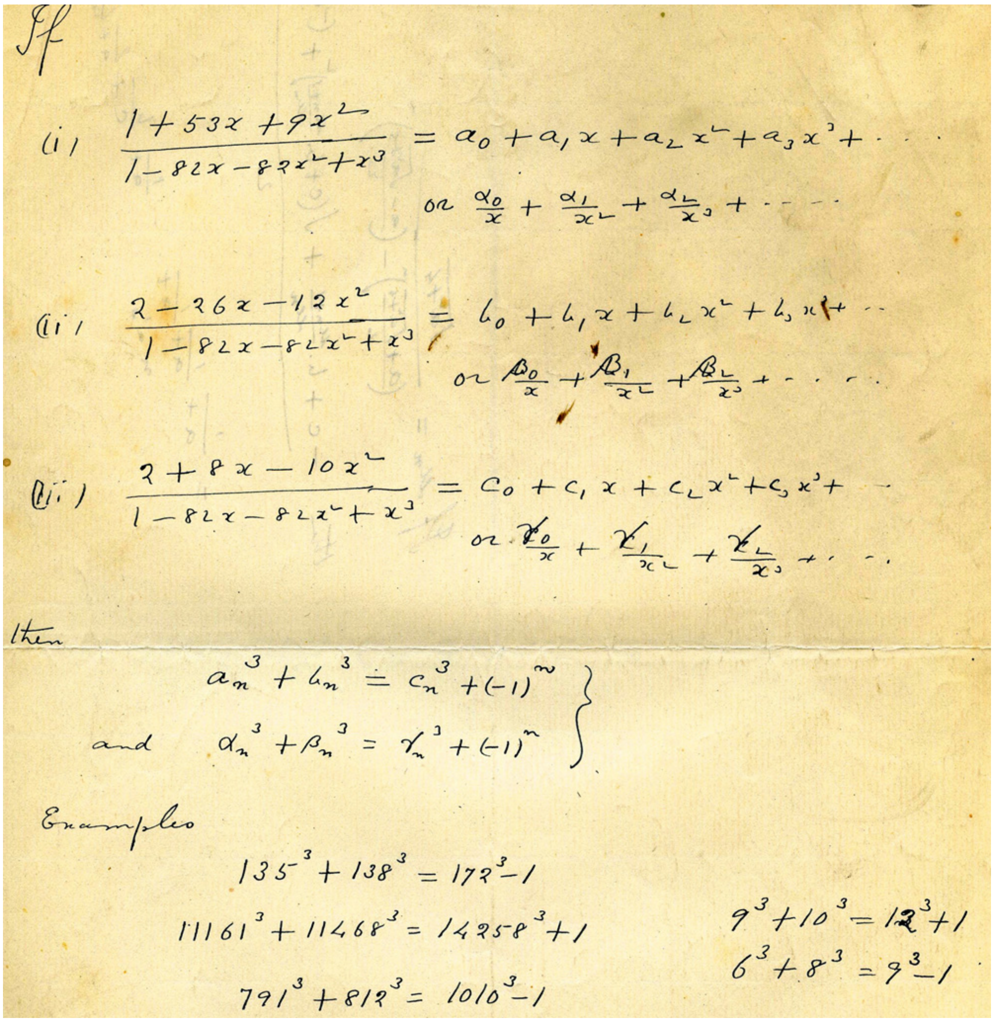
https://www.britannica.com/biography/Srinivasa-Ramanujan



If

(i) $$\frac{1+53x+9x^2}{1-82x-82x^2+x^3} = a_0 + a_1 x + a_2 x^2 + a_3 x^3 + \cdots$$
or $$\frac{\alpha_0}{x} + \frac{\alpha_1}{x^2} + \frac{\alpha_2}{x^3} + \cdots$$

(ii) $$\frac{2-26x-12x^2}{1-82x-82x^2+x^3} = b_0 + b_1 x + b_2 x^2 + b_3 x^3 + \cdots$$
or $$\frac{\beta_0}{x} + \frac{\beta_1}{x^2} + \frac{\beta_2}{x^3} + \cdots$$

(iii) $$\frac{2+8x-10x^2}{1-82x-82x^2+x^3} = c_0 + c_1 x + c_2 x^2 + c_3 x^3 + \cdots$$
or $$\frac{\gamma_0}{x} + \frac{\gamma_1}{x^2} + \frac{\gamma_2}{x^3} + \cdots$$

then

$$a_n^3 + b_n^3 = c_n^3 + (-1)^n$$
and $$\alpha_n^3 + \beta_n^3 = \gamma_n^3 + (-1)^n$$

Examples

$$135^3 + 138^3 = 172^3 - 1$$
$$11161^3 + 11468^3 = 14258^3 + 1$$
$$791^3 + 812^3 = 1010^3 - 1$$
$$9^3 + 10^3 = 12^3 + 1$$
$$6^3 + 8^3 = 9^3 - 1$$

https://plus.maths.org/content/ramanujan

Ramanujan's manuscript

The representations of 1729 as the sum of two cubes appear in the bottom right corner. The equation expressing the near counter examples to Fermat's last theorem appears further up: $\alpha^3 + \beta^3 = \gamma^3 + (-1)^n$.

From Wikipedia

The ***taxicab number****, typically denoted Ta(n) or Taxicab(n), also called the nth* ***Hardy–Ramanujan number****, is defined as the smallest integer that can be expressed as a sum of two positive integer cubes in n distinct ways. The most famous taxicab number is* $1729 = Ta(2) = 1^3 + 12^3 = 9^3 + 10^3$.

From:

Black Hole Microstate Counting and its Macroscopic Counterpart
Ipsita Mandal and Ashoke Sen - arXiv:1008.3801v2 [hep-th] 3 Apr 2012

Now, typically all the fermion zero modes associated with the broken supersymmetries are hair degrees of freedom, since we can generate these zero mode deformations by supersymmetry transformation parameters which go to constant at infinity and vanish below a certain radius. Thus the hair modes contain $2k$ fermion zero modes, and in order that the trace over these zero modes do not make the whole trace vanish, we need an insertion of $(2h_{hair})^k$ into the trace. In other words, if we expand the $(2h_{hor} + 2h_{hair})^k$ factor in a binomial expansion, then only the $(2h_{hair})^k$ term will contribute. This gives

$$B_{k;macro} = \frac{1}{k!} Tr\{(-1)^{2h_{hor}+2h_{hair}} (2h_{hair})^k\} = \sum B_{0;hor}\, B_{k;hair} \,. \tag{3.30}$$

This can be expanded in the spirit of (3.27) as

$$B_{k;macro}(\vec{Q}) = \sum_n \sum_{\substack{\{\vec{Q}_i\},\vec{Q}_{hair} \\ \sum_{i=1}^n \vec{Q}_i + \vec{Q}_{hair} = \vec{Q}}} \left\{ \prod_{i=1}^n B_{0;hor}(\vec{Q}_i) \right\} B_{k;hair}(\vec{Q}_{hair}; \{\vec{Q}_i\}) \,, \tag{3.31}$$

where now the vector $\vec{Q}$ no longer contains the angular momentum. A further simplification follows from the fact that in four dimensions, only the $h_{hor} = 0$ black holes are supersymmetric. This is of course known to be true for a classical black hole, but more generally it follows from the fact that unbroken supersymmetries, together with the $SL(2, R)$ isometry of the near horizon geometry, generate the full $SU(1, 1|2)$ supergroup which includes $SU(2)$ as a symmetry group. This implies a spherically symmetric horizon, and hence zero angular momentum since the partition function on AdS_2 computes the entropy in a fixed angular momentum sector (microcanonical ensemble). Thus $B_{0;hor} = Tr_{hor}(1) = d_{hor}$, and we can express (3.31) as

$$B_{k;macro}(\vec{Q}) = \sum_n \sum_{\substack{\{\vec{Q}_i\},\vec{Q}_{hair} \\ \sum_{i=1}^n \vec{Q}_i + \vec{Q}_{hair} = \vec{Q}}} \left\{ \prod_{i=1}^n d_{hor}(\vec{Q}_i) \right\} B_{k;hair}(\vec{Q}_{hair}; \{\vec{Q}_i\}) \,. \tag{3.32}$$

Most of our analysis involves 1/4-BPS black holes in $\mathcal{N} = 4$ supersymmetric string theories in $D = 4$ which preserves 4 out of 16 supersymmetries, i.e., such a black hole configuration breaks 12 supersymmetries. Thus the relevant helicity trace index is B_6. In these theories, the contribution from multi-centered black holes is known to be exponentially suppressed [26,38,48]. Furthermore, for single-centered black holes, often the only hair modes are the fermion zero modes. In this case, $\vec{Q}_{hair} = 0$. Furthermore, since for each pair of fermion zero modes $Tr\{(-1)^F(2h)\} = i$, we have $B_{6;hair} = i^6 = -1$. Thus

$$B_{6;macro}(\vec{Q}) = -d_{hor}(\vec{Q}) \,, \tag{3.33}$$

up to exponentially suppressed contribution from multi-centered black holes. This explains how we can compare the helicity trace index computed in the microscopic theory with d_{hor} computed in the macroscopic theory. Note that since $d_{hor}(\vec{Q}) > 0$, we get $B_{6;macro} < 0$. This agrees with the explicit microscopic results stated above (2.17) and below (2.31).

The prediction that $B_{6;macro}$ and hence $B_{6;micro}$ is negative holds even for finite charges for single centered black holes. Thus if we take the microscopic results for the index in some specific chamber of the moduli space and then i) either focus on the charges for which only single centered black holes contribute to the index in that chamber, or ii) allow the charge to be arbitrary but explicitly subtract the contribution from the two centered configurations which could contribute to the index, then the result for $-B_{6;micro}$ must be positive in every case. This has been verified explicitly for all the CHL models for low values of the charges [126]. We have shown in table 1 the result for $-B_6$ for heterotic string theory on T^6 for some combinations of the charges. The boldfaced entries represent charges for which only single centered black holes contribute to the index, and as we can see, they are all positive.[17] The complete proof of the positivity of $-B_{6;micro}$ for all charges is still awaited.

Finally we would like to mention that a similar proof of the equality of degeneracy and index also exists for five dimensional black holes [88].

We have the following Table:

$(Q^2, P^2)\backslash Q.P$	-2	0	1	2	3	4
(2,2)	-209304	**50064**	**25353**	648	327	0
(2,4)	-2023536	**1127472**	**561576**	**50064**	8376	-648
(4,4)	-16620544	**32861184**	**18458000**	**3859456**	**561576**	12800
(2,6)	-15493728	**16491600**	**8533821**	**1127472**	130329	-15600
(4,6)	-53249700	**632078672**	**392427528**	**110910300**	**18458000**	**1127472**
(6,6)	2857656828	**16193130552**	**11232685725**	4173501828	**920577636**	**110910300**

Table 1: Some results for $-B_6$ in heterotic string theory on T^6 for different values of Q^2, P^2 and $Q.P$ in a particular chamber of the moduli space. The boldfaced entries are for charges for which only single centered black holes contribute to the index in the chamber in which B_6 is being computed.

We have already analyzed 1127472 561576 18458000 and last row from 16193130552 to 110910300. Now, let's analyze other numbers. We have:

632078672 and 392427528

We have that:

ln(632078672)

Input:

log(632 078 672)

log(x) is the natural logarithm

Decimal approximation:

20.26452442537667140426126182749112157318975704933394619064...

20.264524425…

Property:

log(632 078 672) is a transcendental number

Alternate forms:

4 log(2) + log(39 504 917)

4 log(2) + log(43) + log(233) + log(3943)

Alternative representations:

$\log(632\,078\,672) = \log_e(632\,078\,672)$

$\log(632\,078\,672) = \log(a)\log_a(632\,078\,672)$

$\log(632\,078\,672) = -\text{Li}_1(-632\,078\,671)$

Integral representations:

$\log(632\,078\,672) = \int_1^{632\,078\,672} \frac{1}{t}\,dt$

$\log(632\,078\,672) = -\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{632\,078\,671^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$ for $-1 < \gamma < 0$

And:

ln(392427528)

Input:

$\log(392\,427\,528)$

$\log(x)$ is the natural logarithm

Decimal approximation:

19.787862436100080923088178858070912466303303738037477128 59...

19.7878624361…

Property:

$\log(392\,427\,528)$ is a transcendental number

Alternate forms:

$3\log(2) + \log(49\,053\,441)$

$3\log(2) + \log(3) + \log(103) + \log(158\,749)$

Alternative representations:

$\log(392\,427\,528) = \log_e(392\,427\,528)$

$\log(392427528) = \log(a)\log_a(392427528)$

$\log(392427528) = -\text{Li}_1(-392427527)$

Integral representations:

$$\log(392427528) = \int_1^{392427528} \frac{1}{t}\,dt$$

$$\log(392427528) = -\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{392427527^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

ln(632078672+392427528)

Input:

$\log(632078672 + 392427528)$

$\log(x)$ is the natural logarithm

Exact result:

$\log(1024506200)$

Decimal approximation:

20.74747657735746935452055358742993608558980019353104741587...

20.747476577… result near to the black hole entropy 20.5520

Property:

$\log(1024506200)$ is a transcendental number

Alternate forms:

$3\log(2) + 2\log(145) + \log(6091)$

$3\log(2) + 2\log(5) + 2\log(29) + \log(6091)$

Alternative representations:

$\log(632078672 + 392427528) = \log_e(1024506200)$

$\log(632078672 + 392427528) = \log(a)\log_a(1024506200)$

$$\log(632\,078\,672 + 392\,427\,528) = -\text{Li}_1(-1\,024\,506\,199)$$

Integral representations:

$$\log(632\,078\,672 + 392\,427\,528) = \int_1^{1\,024\,506\,200} \frac{1}{t}\,dt$$

$$\log(632\,078\,672 + 392\,427\,528) = -\frac{i}{2\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{1\,024\,506\,199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$

for $-1 < \gamma < 0$

2Pi*ln(632078672+392427528)+4+1/golden ratio

where 4 is a Lucas number

Input:

$$2\pi\log(632\,078\,672 + 392\,427\,528) + 4 + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi} + 4 + 2\pi\log(1\,024\,506\,200)$$

Decimal approximation:

134.9782739806549614068484379945896940423406253704983701253...

134.97827398… ≈ 135 (Ramanujan taxicab number)

Alternate forms:

$$\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi\log(1\,024\,506\,200)$$

$$4 + \frac{2}{1+\sqrt{5}} + 2\pi\log(1\,024\,506\,200)$$

$$\frac{1}{\phi} + 4 + \pi\,(6\log(2) + 4\log(145) + 2\log(6091))$$

Alternative representations:

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+2\pi\log_e(1024506200)+\frac{1}{\phi}$$

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}$$

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4-2\pi\,\mathrm{Li}_1(-1024506199)+\frac{1}{\phi}$$

Series representations:

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+2\pi\log(1024506199)-2\pi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}$$

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+4i\pi^2\left\lfloor\frac{\arg(1024506200-x)}{2\pi}\right\rfloor+2\pi\log(x)-2\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-x)^k x^{-k}}{k}\quad\text{for } x<0$$

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+4i\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+2\pi\log(z_0)-2\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+\frac{1}{\phi}+2\pi\int_1^{1024506200}\frac{1}{t}\,dt$$

$$2\pi\log(632078672+392427528)+4+\frac{1}{\phi}=4+\frac{1}{\phi}-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

2Pi*ln(632078672+392427528)+7+1/golden ratio

where 7 is a Lucas number

Input:

$$2\pi \log(632\,078\,672 + 392\,427\,528) + 7 + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi} + 7 + 2\pi \log(1\,024\,506\,200)$$

Decimal approximation:

137.9782739806549614068484379945896940423406253704983701253...

137.97827398… ≈ 138 (Ramanujan taxicab number)

Alternate forms:

$$\frac{1}{2}\left(13 + \sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)$$

$$7 + \frac{2}{1 + \sqrt{5}} + 2\pi \log(1\,024\,506\,200)$$

$$\frac{1}{\phi} + 7 + \pi\,(6 \log(2) + 4 \log(145) + 2 \log(6091))$$

Alternative representations:

$$2\pi \log(632\,078\,672 + 392\,427\,528) + 7 + \frac{1}{\phi} = 7 + 2\pi \log_e(1\,024\,506\,200) + \frac{1}{\phi}$$

$$2\pi \log(632\,078\,672 + 392\,427\,528) + 7 + \frac{1}{\phi} = 7 + 2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{\phi}$$

$$2\pi \log(632\,078\,672 + 392\,427\,528) + 7 + \frac{1}{\phi} = 7 - 2\pi \operatorname{Li}_1(-1\,024\,506\,199) + \frac{1}{\phi}$$

Series representations:

$$2\pi\log(632078672+392427528)+7+\frac{1}{\phi}=$$
$$7+\frac{1}{\phi}+2\pi\log(1024506199)-2\pi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}$$

$$2\pi\log(632078672+392427528)+7+\frac{1}{\phi}=7+\frac{1}{\phi}+4i\pi^2\left\lfloor\frac{\arg(1024506200-x)}{2\pi}\right\rfloor+$$
$$2\pi\log(x)-2\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-x)^k x^{-k}}{k}\quad\text{for } x<0$$

$$2\pi\log(632078672+392427528)+7+\frac{1}{\phi}=7+\frac{1}{\phi}+$$
$$4i\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+2\pi\log(z_0)-2\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$2\pi\log(632078672+392427528)+7+\frac{1}{\phi}=7+\frac{1}{\phi}+2\pi\int_1^{1024506200}\frac{1}{t}\,dt$$

$$2\pi\log(632078672+392427528)+7+\frac{1}{\phi}=$$
$$7+\frac{1}{\phi}-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

2Pi*ln(632078672+392427528)+34+5+golden ratio^2

where 34 and 5 are Fibonacci numbers

Input:

$$2\pi\log(632078672+392427528)+34+5+\phi^2$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\phi^2+39+2\pi\log(1024506200)$$

Decimal approximation:

171.9782739806549614068484379945896940423406253704983701253...

171.97827398… ≈ 172 (Ramanujan taxicab number)

Alternate forms:

$$\frac{1}{2}\left(81+\sqrt{5}+4\pi\log(1024506200)\right)$$

$$\frac{81}{2}+\frac{\sqrt{5}}{2}+2\pi\log(1024506200)$$

$$\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1024506200)$$

Alternative representations:

$$2\pi\log(632078672+392427528)+34+5+\phi^2 = 39+2\pi\log_e(1024506200)+\phi^2$$

$$2\pi\log(632078672+392427528)+34+5+\phi^2 = 39+2\pi\log(a)\log_a(1024506200)+\phi^2$$

$$2\pi\log(632078672+392427528)+34+5+\phi^2 = 39-2\pi\,\mathrm{Li}_1(-1024506199)+\phi^2$$

Series representations:

$$2\pi\log(632078672+392427528)+34+5+\phi^2 = 39+\phi^2+2\pi\log(1024506199)-2\pi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}$$

$$2\pi\log(632078672+392427528)+34+5+\phi^2 = 39+\phi^2+4i\pi^2\left\lfloor\frac{\arg(1024506200-x)}{2\pi}\right\rfloor+2\pi\log(x)-2\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-x)^k x^{-k}}{k} \quad \text{for } x<0$$

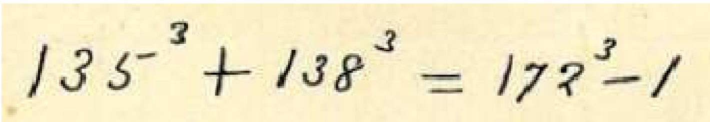
$$2\pi\log(632078672+392427528)+34+5+\phi^2 = 39+\phi^2+4i\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+2\pi\log(z_0)-2\pi\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2 = 39+\phi^2+2\pi\int_1^{1024\,506\,200}\frac{1}{t}\,dt$$

$$2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2 = 39+\phi^2-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

From the following Ramanujan taxicab numbers



we obtain:

2Pi*ln(632078672+392427528)+4+1/golden ratio

2Pi*ln(632078672+392427528)+7+1/golden ratio

2Pi*ln(632078672+392427528)+34+5+golden ratio^2

(((2Pi*ln(632078672+392427528)+4+1/golden ratio)))^3+(((2Pi*ln(632078672+392427528)+7+1/golden ratio)))^3

Input:

$$\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Decimal approximation:

$5.0860182655188907221695156066419817526979032896320544\ldots \times 10^6$

Decimal form:

5086018.26551889072216951560664198175269790328963205445

5086018.265

Alternate forms:

$$\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3+\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3$$

$$\left(4+\frac{2}{1+\sqrt{5}}+2\pi\log(1024506200)\right)^3+\left(7+\frac{2}{1+\sqrt{5}}+2\pi\log(1024506200)\right)^3$$

$$\frac{2}{\phi^3}+\frac{33}{\phi^2}+\frac{195}{\phi}+\frac{24\pi^2\log^2(1024506200)}{\phi}+\frac{12\pi\log(1024506200)}{\phi^2}+\frac{132\pi\log(1024506200)}{\phi}+407+16\pi^3\log^3(1024506200)+132\pi^2\log^2(1024506200)+390\pi\log(1024506200)$$

Alternative representations:

$$\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3=\left(4+2\pi\log_e(1024506200)+\frac{1}{\phi}\right)^3+\left(7+2\pi\log_e(1024506200)+\frac{1}{\phi}\right)^3$$

$$\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3=\left(4+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}\right)^3+\left(7+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}\right)^3$$

$$\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3=\left(4-2\pi\,\mathrm{Li}_1(-1024506199)+\frac{1}{\phi}\right)^3+\left(7-2\pi\,\mathrm{Li}_1(-1024506199)+\frac{1}{\phi}\right)^3$$

Series representations:

$$\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3=\left(4+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1\,024\,506\,199}\right)^k}{k}\right)\right)^3+\left(7+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1\,024\,506\,199}\right)^k}{k}\right)\right)^3$$

$$\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3=\left(4+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3+\left(7+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3 \quad \text{for } x<0$$

$$\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3=\left(4+\frac{1}{\phi}+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(7+\frac{1}{\phi}+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-z_0)^k z_0^{-k}}{k}\right)\right)^3$$

Integral representations:

$$\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3=$$
$$\frac{1}{(1+\sqrt{5})^3}8\left(1125+521\sqrt{5}+300\pi^2\left(\int_1^{1024506200}\frac{1}{t}\,dt\right)^2+144\sqrt{5}\,\pi^2\left(\int_1^{1024506200}\frac{1}{t}\,dt\right)^2+32\pi^3\left(\int_1^{1024506200}\frac{1}{t}\,dt\right)^3+16\sqrt{5}\,\pi^3\left(\int_1^{1024506200}\frac{1}{t}\,dt\right)^3+2\int_1^{1024506200}\frac{6\left(2+22\phi+65\phi^2\right)\pi}{\phi^2 t}\,dt+\sqrt{5}\int_1^{1024506200}\frac{6\left(2+22\phi+65\phi^2\right)\pi}{\phi^2 t}\,dt\right)$$

$$\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3=$$
$$\frac{1}{(1+\sqrt{5})^3}2i\left(15i+11i\sqrt{5}+2\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds+2\sqrt{5}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)$$
$$\left(-124-48\sqrt{5}+35i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds+13i\sqrt{5}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds+3\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2+\sqrt{5}\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2\right)\quad\text{for } -1<\gamma<0$$

We note that, From the formula of coefficients of the '5th order' mock theta function ψ_1(q): (A053261 OEIS Sequence)

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

for n = 577-0.6 , we obtain:

sqrt(golden ratio) * exp(Pi*sqrt((577-0.6)/15)) / (2*5^(1/4)*sqrt((577-0.6))) + (7+29-3+521+3571)

where 7, 29, 3, 521 and 3571 are Lucas numbers

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{577-0.6}{15}}\right)}{2 \sqrt[4]{5} \sqrt{577-0.6}} + (7 + 29 - 3 + 521 + 3571)$$

ϕ is the golden ratio

Result:

$5.0860182\ldots \times 10^6$

5086018.2…

Series representations:

$$\frac{\sqrt{\phi} \exp\left(\pi \sqrt{\frac{577-0.6}{15}}\right)}{2 \sqrt[4]{5} \sqrt{577-0.6}} + (7 + 29 - 3 + 521 + 3571) = \left(41\,250 \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (576.4 - z_0)^k z_0^{-k}}{k!} + 5^{3/4} \exp\left(\pi \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (38.4267 - z_0)^k z_0^{-k}}{k!}\right) \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (\phi - z_0)^k z_0^{-k}}{k!}\right) \Big/ \left(10 \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (576.4 - z_0)^k z_0^{-k}}{k!}\right) \text{ for not } ((z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \leq 0))$$

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{577-0.6}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{577-0.6}}+(7+29-3+521+3571)=$$

$$\left(41\,250\exp\left(i\pi\left\lfloor\frac{\arg(576.4-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(576.4-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+5^{3/4}\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(38.4267-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(38.4267-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(\phi-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Big/\left(10\exp\left(i\pi\left\lfloor\frac{\arg(576.4-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k\,(576.4-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{577-0.6}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{577-0.6}}+(7+29-3+521+3571)=$$

$$\left(\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor}z_0^{-1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor}\left(41\,250\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(576.4-z_0)^k\,z_0^{-k}}{k!}+5^{3/4}\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(38.4267-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(38.4267-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(38.4267-z_0)^k\,z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}z_0^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\,z_0^{-k}}{k!}\right)\right)\Big/\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(576.4-z_0)^k\,z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

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

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

$\arg(z)$ is the complex argument

(((2Pi*ln(632078672+392427528)+34+5+golden ratio^2)))^3

Input:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$(\phi^2+39+2\pi\log(1\,024\,506\,200))^3$$

Decimal approximation:

$$5.086520015883110976733179403679526772444589516304185 54\ldots\times10^6$$

Decimal form:

5086520.015883110976733179403679526772444589516304185 54

5086520.0158

Alternate forms:

$$\frac{1}{8}\left(81+\sqrt{5}+4\pi\log(1\,024\,506\,200)\right)^3$$

$$\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3$$

$$\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\log(1\,024\,506\,200)\right)^3$$

Alternative representations:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3=(39+2\pi\log_e(1\,024\,506\,200)+\phi^2)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3=(39+2\pi\log(a)\log_a(1\,024\,506\,200)+\phi^2)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3=(39-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\phi^2)^3$$

Series representations:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3=\left(39+\phi^2+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1\,024\,506\,199}\right)^k}{k}\right)\right)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 = \left(39+\phi^2+2\pi\left(2 i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3 \quad \text{for } x<0$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 = \left(39+\phi^2+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-z_0)^k z_0^{-k}}{k}\right)\right)^3$$

Integral representations:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 = \left(39+\phi^2+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 = \left(39+\phi^2-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3 \quad \text{for } -1<\gamma<0$$

We have:

((((((2Pi*ln(632078672+392427528)+34+5+golden ratio^2)))^3)))-((((((2Pi*ln(632078672+392427528)+4+1/golden ratio)))^3+(((2Pi*ln(632078672+392427528)+7+1/golden ratio)))^3)))

Input:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 - \left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$-\left(\frac{1}{\phi}+4+2\pi\log(1024506200)\right)^3-\left(\frac{1}{\phi}+7+2\pi\log(1024506200)\right)^3+\left(\phi^2+39+2\pi\log(1024506200)\right)^3$$

Decimal approximation:

501.75036422025456366379703754501974668622667213109107503 93...

501.750364…

Alternate forms:

$$-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3$$

$$-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\log(1024506200)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\log(1024506200)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\log(1024506200)\right)^3$$

$$-\frac{1}{(1+\sqrt{5})^3}8\left(-144344-70983\sqrt{5}+16\pi^3\log^3(1024506200)+8\sqrt{5}\pi^3\log^3(1024506200)-702\pi^2\log^2(1024506200)-354\sqrt{5}\pi^2\log^2(1024506200)-19929\pi\log(1024506200)-9873\sqrt{5}\pi\log(1024506200)\right)$$

Alternative representations:

$$(2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)=-\left(4+2\pi\log_e(1024506200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log_e(1024506200)+\frac{1}{\phi}\right)^3+(39+2\pi\log_e(1024506200)+\phi^2)^3$$

$$(2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)=-\left(4+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}\right)^3+(39+2\pi\log(a)\log_a(1024506200)+\phi^2)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)=$$
$$-\left(4-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3-\left(7-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3+(39-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\phi^2)^3$$

Series representations:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)=$$
$$-\left(4+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3+\left(39+\phi^2+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)=$$
$$-\left(4+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3+\left(39+\phi^2+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3 \quad \text{for } x<0$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)=$$

$$-\left(4+\frac{1}{\phi}+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-z_0)^k z_0^{-k}}{k}\right)\right)^3-$$
$$\left(7+\frac{1}{\phi}+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-z_0)^k z_0^{-k}}{k}\right)\right)^3+$$
$$\left(39+\phi^2+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-z_0)^k z_0^{-k}}{k}\right)\right)^3$$

((((((2Pi*ln(632078672+392427528)+34+5+golden ratio^2)))^3)))-((((((2Pi*ln(632078672+392427528)+4+1/golden ratio)))^3+(((2Pi*ln(632078672+392427528)+7+1/golden ratio)))^3)))-4

Input:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)-4$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$-\left(\frac{1}{\phi}+4+2\pi\log(1\,024\,506\,200)\right)^3-\left(\frac{1}{\phi}+7+2\pi\log(1\,024\,506\,200)\right)^3+(\phi^2+39+2\pi\log(1\,024\,506\,200))^3-4$$

Decimal approximation:

497.750364220254563663797037545019746686226672131091075039 3...

497.750364… result practically equal to the rest mass of Kaon meson 497.614

Alternate forms:

$$-4-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3$$

$$-4-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\log(1\,024\,506\,200)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\log(1\,024\,506\,200)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\log(1\,024\,506\,200)\right)^3$$

$$-\frac{1}{(1+\sqrt{5})^3}8\left(-144\,336-70\,979\sqrt{5}+16\pi^3\log^3(1\,024\,506\,200)+8\sqrt{5}\,\pi^3\log^3(1\,024\,506\,200)-702\pi^2\log^2(1\,024\,506\,200)-354\sqrt{5}\,\pi^2\log^2(1\,024\,506\,200)-19\,929\pi\log(1\,024\,506\,200)-9873\sqrt{5}\,\pi\log(1\,024\,506\,200)\right)$$

Alternative representations:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)-4=$$
$$-4-\left(4+2\pi\log_e(1\,024\,506\,200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log_e(1\,024\,506\,200)+\frac{1}{\phi}\right)^3+(39+2\pi\log_e(1\,024\,506\,200)+\phi^2)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)-4=$$
$$-4-\left(4+2\pi\log(a)\log_a(1\,024\,506\,200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log(a)\log_a(1\,024\,506\,200)+\frac{1}{\phi}\right)^3+(39+2\pi\log(a)\log_a(1\,024\,506\,200)+\phi^2)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)-4=$$
$$-4-\left(4-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3-\left(7-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3+(39-2\pi\,\mathrm{Li}_1(-1\,024\,506\,199)+\phi^2)^3$$

Series representations:

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)-4=$$
$$-4-\left(4+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3+\left(39+\phi^2+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)-4=$$
$$-4-\left(4+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1\,024\,506\,200-x)^k\,x^{-k}}{k}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1\,024\,506\,200-x)^k\,x^{-k}}{k}\right)\right)^3+\left(39+\phi^2+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1\,024\,506\,200-x)^k\,x^{-k}}{k}\right)\right)^3\quad\text{for } x<0$$

$$(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 - \left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3 + \left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right) - 4 =$$

$$-4-\left(4+\frac{1}{\phi}+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1\,024\,506\,200-z_0)^k\,z_0^{-k}}{k}\right)\right)^3 -$$
$$\left(7+\frac{1}{\phi}+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1\,024\,506\,200-z_0)^k\,z_0^{-k}}{k}\right)\right)^3 +$$
$$\left(39+\phi^2+2\pi\left(\log(z_0)+\left\lfloor\frac{\arg(1\,024\,506\,200-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1\,024\,506\,200-z_0)^k\,z_0^{-k}}{k}\right)\right)^3$$

1+1/(((((((((2Pi*ln(632078672+392427528)+34+5+golden ratio^2)))^3)))-((((((2Pi*ln(632078672+392427528)+4+1/golden ratio)))^3+(((2Pi*ln(632078672+392427528)+7+1/golden ratio)))^3))))))

Input:

$$1+1\Big/\left((2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3 - \left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3 + \left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$1\Big/\left(-\left(\frac{1}{\phi}+4+2\pi\log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{\phi}+7+2\pi\log(1\,024\,506\,200)\right)^3 + (\phi^2+39+2\pi\log(1\,024\,506\,200))^3\right)+1$$

Decimal approximation:

1.001993022967813985673266406994479708667870995535229821198...

1.0019930229… result very near to the following Rogers-Ramanujan continued fractions:

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

Alternate forms:

$$1+1\Big/\left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3\right)$$

$$1+1\Big/\left(-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\log(1024506200)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\log(1024506200)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\log(1024506200)\right)^3\right)$$

$$1+\left(-2-\sqrt{5}\right)\Big/\left(-144344-70983\sqrt{5}+16\pi^3\log^3(1024506200)+8\sqrt{5}\,\pi^3\log^3(1024506200)-702\pi^2\log^2(1024506200)-354\sqrt{5}\,\pi^2\log^2(1024506200)-19929\pi\log(1024506200)-9873\sqrt{5}\,\pi\log(1024506200)\right)$$

Alternative representations:

$$1+1\Big/\left(\left(2\pi\log(632078672+392427528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$
$$1+1\Big/\left(-\left(4+2\pi\log_e(1024506200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log_e(1024506200)+\frac{1}{\phi}\right)^3+\left(39+2\pi\log_e(1024506200)+\phi^2\right)^3\right)$$

$$1+1\Big/\left(\left(2\pi\log(632078672+392427528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$
$$1+1\Big/\left(-\left(4-2\pi\,\mathrm{Li}_1(-1024506199)+\frac{1}{\phi}\right)^3-\left(7-2\pi\,\mathrm{Li}_1(-1024506199)+\frac{1}{\phi}\right)^3+\left(39-2\pi\,\mathrm{Li}_1(-1024506199)+\phi^2\right)^3\right)$$

$$1+1\Big/\left(\left(2\pi\log(632078672+392427528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$
$$1+1\Big/\left(-\left(4+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log(a)\log_a(1024506200)+\frac{1}{\phi}\right)^3+\left(39+2\pi\log(a)\log_a(1024506200)+\phi^2\right)^3\right)$$

Series representations:

$$1+1\Big/\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$

$$1+1\Big/\left(-\left(4+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3+\left(39+\phi^2+2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3\right)$$

$$1+1\Big/\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$

$$1+1\Big/\left(-\left(4+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3+\left(39+\phi^2+2\pi\left(2i\pi\left\lfloor\frac{\arg(1\,024\,506\,200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1\,024\,506\,200-x)^k x^{-k}}{k}\right)\right)^3\right)\quad\text{for } x<0$$

$$1+1\bigg/\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$

$$1+1\bigg/\left(-\left(4+\frac{1}{\phi}+2\pi\left(\operatorname{Res}_{s=0}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3-\left(7+\frac{1}{\phi}+2\pi\left(\operatorname{Res}_{s=0}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3+\left(39+\phi^2+2\pi\left(\operatorname{Res}_{s=0}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3\right)$$

Integral representations:

$$1+1\bigg/\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$

$$1+1\bigg/\left(-\left(4+\frac{1}{\phi}+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3-\left(7+\frac{1}{\phi}+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3+\left(39+\phi^2+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3\right)$$

$$1+1\bigg/\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2\right)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)=$$

$$1+1\bigg/\left(-\left(4+\frac{1}{\phi}-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3-\left(7+\frac{1}{\phi}-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3+\left(39+\phi^2-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1\,024\,506\,199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3\right)\quad\text{for } -1<\gamma<0$$

1/(((1+1/(((((((((2Pi*ln(632078672+392427528)+34+5+golden ratio^2)))^3)))-((((((2Pi*ln(632078672+392427528)+4+1/golden ratio)))^3+(((2Pi*ln(632078672+392427528)+7+1/golden ratio)))^3)))))))))^1/3

Input:

$$1\Big/\left(\left(1+1\Big/\left((2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\sqrt[3]{\frac{1}{-\left(\frac{1}{\phi}+4+2\pi\log(1024506200)\right)^3-\left(\frac{1}{\phi}+7+2\pi\log(1024506200)\right)^3+\left(\phi^2+39+2\pi\log(1024506200)\right)^3}+1}}$$

Decimal approximation:

0.999336540342601751179580722653988992362914826535284331121...

0.99933654… result very near to the value of the following Rogers-Ramanujan continued fraction:

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

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

Alternate forms:

$$1\Big/\left(\left(1+1\Big/\left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3\right)\right)\wedge(1/3)\right)$$

$$1\Big/\left(\left(1+1\Big/\left(-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\log(1\,024\,506\,200)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\log(1\,024\,506\,200)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\log(1\,024\,506\,200)\right)^3\right)\right)\wedge(1/3)\right)$$

$$
\begin{aligned}
&1/(((\phi^9 - 3\,\phi^2\,(65 + 4\,\pi^2\,(18\,\log^2(2) + 2\,(4\,\log^2(5) + 4\,\log^2(29) + \log^2(6091) + 4\,\log(29) \\
&\qquad \log(6091) + 4\,\log(5)\,(2\,\log(29) + \log(6091))) + \\
&\qquad \log(2)\,(24\,\log(145) + 12\,\log(6091))) + \\
&\qquad 44\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) + \\
&\quad \phi^3\,(58\,913 + 336\,\pi^2\,(9\,\log^2(2) + 4\,\log^2(5) + 4\,\log^2(29) + \log^2(6091) + \\
&\qquad 4\,\log(29)\,\log(6091) + 4\,\log(5)\,(2\,\log(29) + \log(6091)) + \\
&\qquad 6\,\log(2)\,(2\,\log(145) + \log(6091))) + \\
&\qquad \pi^3\,(-216\,\log^3(2) - 64\,\log^3(5) - 64\,\log^3(29) - 8\,\log^3(6091) - \\
&\qquad 96\,\log^2(29)\,\log(6091) - 48\,\log(29)\,\log^2(6091) - \\
&\qquad 96\,\log^2(5)\,(2\,\log(29) + \log(6091)) - \\
&\qquad 216\,\log^2(2)\,(2\,\log(145) + \log(6091)) - \\
&\qquad 48\,\log(5)\,(4\,\log^2(29) + \log^2(6091) + 4\,\log(29)\,\log(6091)) - \\
&\qquad 72\,\log(2)\,(4\,\log^2(5) + 4\,\log^2(29) + \log^2(6091) + 4\,\log(29) \\
&\qquad \log(6091) + 4\,\log(5)\,(2\,\log(29) + \log(6091)))) + \\
&\qquad 8736\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) + \\
&\quad 3\,\phi^7\,(39 + 2\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) + \\
&\quad 3 \\
&\quad \phi^5 \\
&\quad (39 + 2\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091)))^2 - \\
&\quad 3\,\phi\,(11 + 4\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) - \\
&\quad 2)/ \\
&(\phi^9 - 3\,\phi^2\,(65 + 4\,\pi^2\,(18\,\log^2(2) + 2\,(4\,\log^2(5) + 4\,\log^2(29) + \log^2(6091) + 4\,\log(\\
&\qquad 29)\,\log(6091) + 4\,\log(5)\,(2\,\log(29) + \log(6091))) + \\
&\qquad \log(2)\,(24\,\log(145) + 12\,\log(6091))) + \\
&\qquad 44\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) - \\
&\quad 8\,\phi^3\,(-7364 - 42\,\pi^2\,(9\,\log^2(2) + 4\,\log^2(5) + 4\,\log^2(29) + \log^2(6091) + \\
&\qquad 4\,\log(29)\,\log(6091) + 4\,\log(5)\,(2\,\log(29) + \log(6091)) + \\
&\qquad 6\,\log(2)\,(2\,\log(145) + \log(6091))) + \\
&\qquad \pi^3\,(27\,\log^3(2) + 8\,\log^3(5) + 8\,\log^3(29) + \log^3(6091) + \\
&\qquad 12\,\log^2(29)\,\log(6091) + 6\,\log(29)\,\log^2(6091) + \\
&\qquad 12\,\log^2(5)\,(2\,\log(29) + \log(6091)) + \\
&\qquad 27\,\log^2(2)\,(2\,\log(145) + \log(6091)) + \\
&\qquad 6\,\log(5)\,(4\,\log^2(29) + \log^2(6091) + 4\,\log(29)\,\log(6091)) + \\
&\qquad 9\,\log(2)\,(4\,\log^2(5) + 4\,\log^2(29) + \log^2(6091) + 4\,\log(29) \\
&\qquad \log(6091) + 4\,\log(5)\,(2\,\log(29) + \log(6091)))) - \\
&\qquad 1092\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) + \\
&\quad 3\,\phi^7\,(39 + 2\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) + \\
&\quad 3\,\phi^5 \\
&\quad (39 + 2\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091)))^2 - \\
&\quad 3\,\phi\,(11 + 4\,\pi\,(3\,\log(2) + 2\,\log(145) + \log(6091))) - \\
&\quad 2))\,{}^\wedge\,(1/3))
\end{aligned}
$$

Alternative representations:

$$1\Big/\left(\left(1+1\Big/\left((2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)=$$

$$\frac{1}{\sqrt[3]{1+\frac{1}{-\left(4+2\pi\log_e(1\,024\,506\,200)+\frac{1}{\phi}\right)^3-\left(7+2\pi\log_e(1\,024\,506\,200)+\frac{1}{\phi}\right)^3+\left(39+2\pi\log_e(1\,024\,506\,200)+\phi^2\right)^3}}}$$

$$1\Big/\left(\left(1+1\Big/\left((2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)=$$

$$\frac{1}{\sqrt[3]{1+\frac{1}{-\left(4-2\pi\,\text{Li}_1(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3-\left(7-2\pi\,\text{Li}_1(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3+\left(39-2\pi\,\text{Li}_1(-1\,024\,506\,199)+\phi^2\right)^3}}}$$

$$1\Big/\left(\left(1+1\Big/\left((2\pi\log(632\,078\,672+392\,427\,528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632\,078\,672+392\,427\,528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632\,078\,672+392\,427\,528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)=$$

$$1\Big/\left(\left(1+1\Big/\left(-\left(4-2\pi\,S_{0,1}(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3-\left(7-2\pi\,S_{0,1}(-1\,024\,506\,199)+\frac{1}{\phi}\right)^3+\left(39-2\pi\,S_{0,1}(-1\,024\,506\,199)+\phi^2\right)^3\right)\right)\wedge(1/3)\right)$$

Series representations:

$$1\Big/\left(\left(1+1\Big/\left((2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\text{^}(1/3)\right)=$$

$$1\Big/\left(\left(1+1\Big/\left(-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\left(\log(1024506199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\left(\log(1024506199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\left(\log(1024506199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)\right)^3\right)\right)\text{^}(1/3)\right)$$

$$1\Big/\left(\left(1+1\Big/\left((2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\text{^}(1/3)\right)=$$

$$1\Big/\left(\left(1+1\Big/\left(-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1024506200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-x)^k x^{-k}}{k}\right)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\left(2i\pi\left\lfloor\frac{\arg(1024506200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-x)^k x^{-k}}{k}\right)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\left(2i\pi\left\lfloor\frac{\arg(1024506200-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1024506200-x)^k x^{-k}}{k}\right)\right)^3\right)\right)\text{^}(1/3)\right)\quad\text{for } x<0$$

$$1/\left(\left(1+1/\left((2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)=$$

$$1/\left(\left(1+1/\left(-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\left(\operatorname{Res}_{s=0}\frac{1024506199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{1024506199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\left(\operatorname{Res}_{s=0}\frac{1024506199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{1024506199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\left(\operatorname{Res}_{s=0}\frac{1024506199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{1024506199^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3\right)\right)\wedge(1/3)\right)$$

Integral representations:

$$1/\left(\left(1+1/\left((2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)=$$

$$1/\left(\left(1+1/\left(-\left(4+\frac{2}{1+\sqrt{5}}+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3-\left(7+\frac{2}{1+\sqrt{5}}+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2+2\pi\int_1^{1024506200}\frac{1}{t}\,dt\right)^3\right)\right)\wedge(1/3)\right)$$

$$1/\left(\left(1+1/\left((2\pi\log(632078672+392427528)+34+5+\phi^2)^3-\left(\left(2\pi\log(632078672+392427528)+4+\frac{1}{\phi}\right)^3+\left(2\pi\log(632078672+392427528)+7+\frac{1}{\phi}\right)^3\right)\right)\right)\wedge(1/3)\right)=$$

$$1/\left(\left(1+1/\left(-\left(4+\frac{2}{1+\sqrt{5}}-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3-\left(7+\frac{2}{1+\sqrt{5}}-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3+\left(39+\frac{1}{4}\left(1+\sqrt{5}\right)^2-i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3\right)\right)\wedge(1/3)\right)\quad \text{for } -1<\gamma<0$$

Now, we obtain:

47log base 0.99933654 ((1/(1 + 1/(-(1/2 (7 + sqrt(5)) + 2 π log(1024506200))^3 - (1/2 (13 + sqrt(5)) + 2 π log(1024506200))^3 + (1/2 (81 + sqrt(5)) + 2 π log(1024506200))^3))))-2+1/golden ratio

where 47 is a Lucas number

Input interpretation:

$$47\log_{0.99933654}\left(1/\left(1+1/\left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3\right)\right)\right)-2+\frac{1}{\phi}$$

$\log(x)$ 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:

$$47 \log_{0.999337}\left(1 \middle/ \left(1 + 1 \middle/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} = -2 + \frac{1}{\phi} + \frac{1}{\log(0.999337)} 47 \log\left(1 \middle/ \left(1 + 1 \middle/ \left(-\left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)$$

$$47 \log_{0.999337}\left(1 \middle/ \left(1 + 1 \middle/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} = -2 + 47 \log_{0.999337}\left(1 \middle/ \left(1 + 1 \middle/ \left(-\left(2\pi \log_e(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log_e(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log_e(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right) + \frac{1}{\phi}$$

$$47 \log_{0.999337}\left(1 \middle/ \left(1 + 1 \middle/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} = -2 + 47 \log_{0.999337}\left(1 \middle/ \left(1 + 1 \middle/ \left(-\left(2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right) + \frac{1}{\phi}$$

Series representations:

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} = -2 + \frac{1}{\phi} - \frac{1}{\log(0.999337)} 47 \sum_{k=1}^{\infty} \frac{1}{k}(-8)^k \left(-\left(1 \Big/ \left(8 - \left(7 + 4\pi \log(1\,024\,506\,200) + \sqrt{5}\right)^3 - \left(13 + 4\pi \log(1\,024\,506\,200) + \sqrt{5}\right)^3 + \left(81 + 4\pi \log(1\,024\,506\,200) + \sqrt{5}\right)^3\right)\right)\right)^k$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} = -2 + \frac{1}{\phi} - \frac{1}{\log(0.999337)} 47 \sum_{k=1}^{\infty} \frac{1}{k}(-1)^k \left(-1 + 1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)^k$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) -$$

$$2 + \frac{1}{\phi} = \frac{1}{\phi}\left(1 - 2\phi + 47\phi \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi\left(\log(1\,024\,506\,199) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right) + \frac{1}{2}\left(7 + \exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^3 - \left(2\pi\left(\log(1\,024\,506\,199) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right) + \frac{1}{2}\left(13 + \exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^3 + \left(2\pi\left(\log(1\,024\,506\,199) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right) + \frac{1}{2}\left(81 + \exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^3\right)\right)\right)\right)$$

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

$$47\log_{0.999337}\left(1\Big/\left(1+1\Big/\left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1\,024\,506\,200)\right)^3\right)\right)\right)-2+\frac{1}{\phi}=\frac{1}{\phi}\left(1-2\phi+\right.$$

$$47\phi\log_{0.999337}\left(1\Big/\left(1+1\Big/\left(-\left(2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)+\frac{1}{2}\left(7+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right)^3-\right.\right.\right.$$

$$\left(2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)+\frac{1}{2}\left(13+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right)^3+$$

$$\left.\left.\left.\left.\left(2\pi\left(\log(1\,024\,506\,199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)+\frac{1}{2}\left(81+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right)^3\right)\right)\right)\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

$n!$ is the factorial function

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

i is the imaginary unit

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

Integral representations:

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1024506200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1024506200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1024506200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} =$$
$$\frac{1}{\phi}\left(1 - 2\phi + 47\phi \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \int_1^{1024506200} \frac{1}{t}\,dt + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \int_1^{1024506200} \frac{1}{t}\,dt + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \int_1^{1024506200} \frac{1}{t}\,dt + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)\right)$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1024506200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1024506200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1024506200)\right)^3\right)\right)\right) - 2 + \frac{1}{\phi} = \frac{1}{\phi}$$
$$\left(1 - 2\phi + 47\phi \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(\frac{1}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(\frac{1}{i}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1024506199^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)\right) \quad \text{for } -1 < \gamma < 0$$

47log base 0.99933654 ((1/(1 + 1/(-(1/2 (7 + sqrt(5)) + 2 π log(1024506200))^3 - (1/2 (13 + sqrt(5)) + 2 π log(1024506200))^3 + (1/2 (81 + sqrt(5)) + 2 π log(1024506200))^3))))-18+golden ratio^2

where 18 is a Lucas number

Input interpretation:

$$47 \log_{0.99933654}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2$$

log(x) is the natural logarithm

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

ϕ is the golden ratio

Result:

125.618...

125.618… 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:

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 + \phi^2 + \frac{1}{\log(0.999337)} 47 \log\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 + 47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \log_e(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log_e(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log_e(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right) + \phi^2$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 =$$

$$-18 + 47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log(a) \log_a(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right) + \phi^2$$

Series representations:

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 + \phi^2 - \frac{1}{\log(0.999337)} 47 \sum_{k=1}^{\infty} \frac{1}{k} (-8)^k \left(-\left(1 \Big/ \left(8 - \left(7 + 4\pi \log(1\,024\,506\,200) + \sqrt{5}\right)^3 - \left(13 + 4\pi \log(1\,024\,506\,200) + \sqrt{5}\right)^3 + \left(81 + 4\pi \log(1\,024\,506\,200) + \sqrt{5}\right)^3\right)\right)\right)^k$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 + \phi^2 - \frac{1}{\log(0.999337)} 47 \sum_{k=1}^{\infty} \frac{1}{k} (-1)^k \left(-1 + 1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \log(1\,024\,506\,200) + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)^k$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 +$$

$$\phi^2 + 47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi\left(\log(1\,024\,506\,199) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{1\,024\,506\,199}\right)^k}{k}\right) + \frac{1}{2}\left(7 + \exp\left(i\pi \left\lfloor \frac{\arg(5-x)}{2\pi} \right\rfloor\right)\sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (5-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right)^3 - \left(2\pi\left(\log(1\,024\,506\,199) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{1\,024\,506\,199}\right)^k}{k}\right) + \frac{1}{2}\left(13 + \exp\left(i\pi \left\lfloor \frac{\arg(5-x)}{2\pi} \right\rfloor\right)\sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (5-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right)^3 + \left(2\pi\left(\log(1\,024\,506\,199) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{1\,024\,506\,199}\right)^k}{k}\right) + \frac{1}{2}\left(81 + \exp\left(i\pi \left\lfloor \frac{\arg(5-x)}{2\pi} \right\rfloor\right)\sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (5-x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right)^3\right)\right)\right)$$

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

$$47\log_{0.999337}\left(1\Big/\left(1+1\Big/\left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3-\left(\frac{1}{2}\left(13+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3+\left(\frac{1}{2}\left(81+\sqrt{5}\right)+2\pi\log(1024506200)\right)^3\right)\right)\right)-18+\phi^2=-18+\phi^2+$$

$$47\log_{0.999337}\left(1\Big/\left(1+1\Big/\left(-\left(2\pi\left(\log(1024506199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)+\frac{1}{2}\left(7+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right)^3-\left(2\pi\left(\log(1024506199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)+\frac{1}{2}\left(13+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right)^3+\left(2\pi\left(\log(1024506199)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{1024506199}\right)^k}{k}\right)+\frac{1}{2}\left(81+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right)^3\right)\right)\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

$n!$ is the factorial function

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

i is the imaginary unit

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

Integral representations:

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 + \phi^2 + 47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(2\pi \int_1^{1024506200} \frac{1}{t}\, dt + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(2\pi \int_1^{1024506200} \frac{1}{t}\, dt + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(2\pi \int_1^{1024506200} \frac{1}{t}\, dt + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right)$$

$$47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{2}\left(7+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 - \left(\frac{1}{2}\left(13+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3 + \left(\frac{1}{2}\left(81+\sqrt{5}\right) + 2\pi \log(1\,024\,506\,200)\right)^3\right)\right)\right) - 18 + \phi^2 = -18 + \phi^2 + 47 \log_{0.999337}\left(1 \Big/ \left(1 + 1 \Big/ \left(-\left(\frac{1}{i} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1\,024\,506\,199^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds + \frac{1}{2}\left(7+\sqrt{5}\right)\right)^3 - \left(\frac{1}{i} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1\,024\,506\,199^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds + \frac{1}{2}\left(13+\sqrt{5}\right)\right)^3 + \left(\frac{1}{i} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1\,024\,506\,199^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds + \frac{1}{2}\left(81+\sqrt{5}\right)\right)^3\right)\right)\right) \text{ for } -1 < \gamma < 0$$

Now, we have:

16491600 and 8533821

ln(16491600+8533821)

Input:

$\log(16\,491\,600 + 8\,533\,821)$

$\log(x)$ is the natural logarithm

Exact result:

$\log(25\,025\,421)$

Decimal approximation:

17.035402706200873511161947091515470826077225508194483119 66...

17.035402706…

Property:

log(25 025 421) is a transcendental number

Alternate form:

$\log(3) + \log(139) + \log(60\,013)$

Alternative representations:

$\log(16\,491\,600 + 8\,533\,821) = \log_e(25\,025\,421)$

$\log(16\,491\,600 + 8\,533\,821) = \log(a) \log_a(25\,025\,421)$

$\log(16\,491\,600 + 8\,533\,821) = -\text{Li}_1(-25\,025\,420)$

Integral representations:

$$\log(16\,491\,600 + 8\,533\,821) = \int_1^{25\,025\,421} \frac{1}{t}\, dt$$

$$\log(16\,491\,600 + 8\,533\,821) = -\frac{i}{2\pi} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{25\,025\,420^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds \quad \text{for } -1 < \gamma < 0$$

Note that:

ln(16491600+8533821)-1/6

Input:

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6}$$

log(x) is the natural logarithm

Exact result:

$$\log(25\,025\,421) - \frac{1}{6}$$

Decimal approximation:

16.86873603953420684449528042484880415941055884152781645299...

16.86873603… result practically equal to the black hole entropy 16.8741 and very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Property:

$-\frac{1}{6} + \log(25\,025\,421)$ is a transcendental number

Alternate forms:

$$\frac{1}{6}(6\log(25\,025\,421) - 1)$$

$$\frac{1}{6}(-1 + 6\log(3) + 6\log(139) + 6\log(60\,013))$$

$$-\frac{1}{6} + \log(3) + \log(139) + \log(60\,013)$$

Alternative representations:

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6} = \log_e(25\,025\,421) - \frac{1}{6}$$

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6} = \log(a)\log_a(25\,025\,421) - \frac{1}{6}$$

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6} = -\text{Li}_1(-25\,025\,420) - \frac{1}{6}$$

Series representations:

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6} = -\frac{1}{6} + \log(25\,025\,420) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{25025\,420}\right)^k}{k}$$

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6} = -\frac{1}{6} + 2\,i\,\pi \left\lfloor \frac{\arg(25\,025\,421 - x)}{2\,\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(25\,025\,421 - x)^k\,x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(16\,491\,600 + 8\,533\,821) - \frac{1}{6} = -\frac{1}{6} + \left\lfloor \frac{\arg(25\,025\,421 - z_0)}{2\,\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(25\,025\,421 - z_0)}{2\,\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(25\,025\,421 - z_0)^k\,z_0^{-k}}{k}$$

Integral representations:

$$\log(16\,491\,600+8\,533\,821)-\frac{1}{6}=-\frac{1}{6}+\int_1^{25\,025\,421}\frac{1}{t}\,dt$$

$$\log(16\,491\,600+8\,533\,821)-\frac{1}{6}=-\frac{1}{6}-\frac{i}{2\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

8*ln(16491600+8533821)-(2*1/golden ratio)

where 8 and 2 are Fibonacci numbers

Input:

$$8\log(16\,491\,600+8\,533\,821)-2\times\frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$8\log(25\,025\,421)-\frac{2}{\phi}$$

Decimal approximation:

135.0471536721071983928864030633924903731771857059443392330...

135.0471536… ≈ 135 (Ramanujan taxicab number)

Property:

$-\frac{2}{\phi}+8\log(25\,025\,421)$ is a transcendental number

Alternate forms:

$$1-\sqrt{5}+8\log(25\,025\,421)$$

$$8\log(25\,025\,421)-\frac{4}{1+\sqrt{5}}$$

$$-\frac{2\,(1-4\,\phi\,(\log(3)+\log(139)+\log(60\,013)))}{\phi}$$

Alternative representations:

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=8\log_e(25\,025\,421)-\frac{2}{\phi}$$

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=8\log(a)\log_a(25\,025\,421)-\frac{2}{\phi}$$

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=-8\,\text{Li}_1(-25\,025\,420)-\frac{2}{\phi}$$

Series representations:

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=-\frac{2}{\phi}+8\log(25\,025\,420)-8\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}$$

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=-\frac{2}{\phi}+16\,i\,\pi\left\lfloor\frac{\arg(25\,025\,421-x)}{2\,\pi}\right\rfloor+8\log(x)-8\sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421-x)^k\,x^{-k}}{k}\quad\text{for } x<0$$

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=-\frac{2}{\phi}+8\left\lfloor\frac{\arg(25\,025\,421-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+8\log(z_0)+8\left\lfloor\frac{\arg(25\,025\,421-z_0)}{2\,\pi}\right\rfloor\log(z_0)-8\sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421-z_0)^k\,z_0^{-k}}{k}$$

Integral representations:

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=-\frac{2}{\phi}+8\int_1^{25\,025\,421}\frac{1}{t}\,dt$$

$$8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}=-\frac{2}{\phi}-\frac{4\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

8*ln(16491600+8533821)-(2/golden ratio)+3

where 3 is a Lucas/Fibonacci number

Input:

$$8 \log(16\,491\,600 + 8\,533\,821) - \frac{2}{\phi} + 3$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$-\frac{2}{\phi} + 3 + 8 \log(25\,025\,421)$$

Decimal approximation:

138.0471536721071983928864030633924903731771857059443392330...

138.0471536… ≈ 138 (Ramanujan taxicab number)

Property:

$3 - \frac{2}{\phi} + 8 \log(25\,025\,421)$ is a transcendental number

Alternate forms:

$$4 - \sqrt{5} + 8 \log(25\,025\,421)$$

$$3 - \frac{4}{1 + \sqrt{5}} + 8 \log(25\,025\,421)$$

$$-\frac{\phi\,(-3 - 8 \log(3) - 8 \log(139) - 8 \log(60\,013)) + 2}{\phi}$$

Alternative representations:

$$8 \log(16\,491\,600 + 8\,533\,821) - \frac{2}{\phi} + 3 = 3 + 8 \log_e(25\,025\,421) - \frac{2}{\phi}$$

$$8 \log(16\,491\,600 + 8\,533\,821) - \frac{2}{\phi} + 3 = 3 + 8 \log(a) \log_a(25\,025\,421) - \frac{2}{\phi}$$

$$8 \log(16\,491\,600 + 8\,533\,821) - \frac{2}{\phi} + 3 = 3 - 8\, \text{Li}_1(-25\,025\,420) - \frac{2}{\phi}$$

Series representations:

$$8\log(16491600+8533821)-\frac{2}{\phi}+3=3-\frac{2}{\phi}+8\log(25025420)-8\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25025420}\right)^k}{k}$$

$$8\log(16491600+8533821)-\frac{2}{\phi}+3=3-\frac{2}{\phi}+16\,i\,\pi\left\lfloor\frac{\arg(25025421-x)}{2\,\pi}\right\rfloor+8\log(x)-8\sum_{k=1}^{\infty}\frac{(-1)^k\,(25025421-x)^k\,x^{-k}}{k}\quad\text{for } x<0$$

$$8\log(16491600+8533821)-\frac{2}{\phi}+3=3-\frac{2}{\phi}+8\left\lfloor\frac{\arg(25025421-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+8\log(z_0)+8\left\lfloor\frac{\arg(25025421-z_0)}{2\,\pi}\right\rfloor\log(z_0)-8\sum_{k=1}^{\infty}\frac{(-1)^k\,(25025421-z_0)^k\,z_0^{-k}}{k}$$

Integral representations:

$$8\log(16491600+8533821)-\frac{2}{\phi}+3=3-\frac{2}{\phi}+8\int_1^{25025421}\frac{1}{t}\,dt$$

$$8\log(16491600+8533821)-\frac{2}{\phi}+3=3-\frac{2}{\phi}-\frac{4\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25025420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

8*ln(16491600+8533821)+34+e-1

where 34 is a Fibonacci number

Input:

$$8\log(16491600+8533821)+34+e-1$$

log(x) is the natural logarithm

Exact result:

$$33+e+8\log(25025421)$$

Decimal approximation:

172.00150347806603332465586420347642910637505115925582453 22...

172.00150347… ≈ 172 (Ramanujan taxicab number)

Alternate forms:

$33 + e + 8 \log(3) + 8 \log(139) + 8 \log(60013)$

$33 + e + 8 (\log(3) + \log(139) + \log(60013))$

Alternative representations:

$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e + 8 \log_e(25025421)$

$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e + 8 \log(a) \log_a(25025421)$

$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e - 8 \operatorname{Li}_1(-25025420)$

Series representations:

$$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e + 8 \log(25025420) - 8 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{25025420}\right)^k}{k}$$

$$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e + 16 i \pi \left\lfloor \frac{\arg(25025421 - x)}{2 \pi} \right\rfloor + 8 \log(x) - 8 \sum_{k=1}^{\infty} \frac{(-1)^k (25025421 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e + 8 \left\lfloor \frac{\arg(25025421 - z_0)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + 8 \log(z_0) + 8 \left\lfloor \frac{\arg(25025421 - z_0)}{2 \pi} \right\rfloor \log(z_0) - 8 \sum_{k=1}^{\infty} \frac{(-1)^k (25025421 - z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e + 8 \int_1^{25025421} \frac{1}{t} \, dt$$

$$8 \log(16491600 + 8533821) + 34 + e - 1 = 33 + e - \frac{4 i}{\pi} \int_{-i \infty + \gamma}^{i \infty + \gamma} \frac{25025420^{-s} \, \Gamma(-s)^2 \, \Gamma(1 + s)}{\Gamma(1 - s)} \, ds \quad \text{for } -1 < \gamma < 0$$

(((8*ln(16491600+8533821)-(2*1/golden ratio))))^3+(((8*ln(16491600+8533821)-(2/golden ratio)+3)))^3

Input:

$$\left(8\log(16\,491\,600+8\,533\,821)-2\times\frac{1}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\left(8\log(25\,025\,421)-\frac{2}{\phi}\right)^3+\left(-\frac{2}{\phi}+3+8\log(25\,025\,421)\right)^3$$

Decimal approximation:

5.093720931847920592757284017864923374897611810276276 71... × 10^6

Decimal form:

5093720.931847920592757284017864923374897611810276276 71

5093720.9318479…

Property:

$\left(-\frac{2}{\phi}+8\log(25\,025\,421)\right)^3+\left(3-\frac{2}{\phi}+8\log(25\,025\,421)\right)^3$ is a transcendental number

Alternate forms:

$$\left(1-\sqrt{5}+8\log(25\,025\,421)\right)^3+\left(4-\sqrt{5}+8\log(25\,025\,421)\right)^3$$

$$\left(8\log(25\,025\,421)-\frac{4}{1+\sqrt{5}}\right)^3+\left(3-\frac{4}{1+\sqrt{5}}+8\log(25\,025\,421)\right)^3$$

$$-\frac{16}{\phi^3}+\frac{36}{\phi^2}-\frac{54}{\phi}-\frac{768\log^2(25\,025\,421)}{\phi}+\frac{192\log(25\,025\,421)}{\phi^2}-\frac{288\log(25\,025\,421)}{\phi}+27+1024\log^3(25\,025\,421)+576\log^2(25\,025\,421)+216\log(25\,025\,421)$$

Alternative representations:

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3=\left(8\log_e(25\,025\,421)-\frac{2}{\phi}\right)^3+\left(3+8\log_e(25\,025\,421)-\frac{2}{\phi}\right)^3$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3=\left(8\log(a)\log_a(25\,025\,421)-\frac{2}{\phi}\right)^3+\left(3+8\log(a)\log_a(25\,025\,421)-\frac{2}{\phi}\right)^3$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3 = \left(-8\,\text{Li}_1(-25\,025\,420)-\frac{2}{\phi}\right)^3+\left(3-8\,\text{Li}_1(-25\,025\,420)-\frac{2}{\phi}\right)^3$$

Series representations:

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3 = \left(-\frac{2}{\phi}+8\left(\log(25\,025\,420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(\log(25\,025\,420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}\right)\right)^3$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3 = \left(-\frac{2}{\phi}+8\left(2\,i\,\pi\left\lfloor\frac{\arg(25\,025\,421-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421-x)^k\,x^{-k}}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(2\,i\,\pi\left\lfloor\frac{\arg(25\,025\,421-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421-x)^k\,x^{-k}}{k}\right)\right)^3 \quad \text{for } x<0$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3 = \left(-\frac{2}{\phi}+8\left(\log(z_0)+\left\lfloor\frac{\arg(25\,025\,421-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421-z_0)^k\,z_0^{-k}}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(\log(z_0)+\left\lfloor\frac{\arg(25\,025\,421-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421-z_0)^k\,z_0^{-k}}{k}\right)\right)^3$$

Integral representations:

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3 = \frac{1}{(1+\sqrt{5})^3}8\left(-25+18\sqrt{5}+192\sqrt{5}\left(\int_1^{25\,025\,421}\frac{1}{t}\,dt\right)^2+2048\left(\int_1^{25025\,421}\frac{1}{t}\,dt\right)^3+1024\sqrt{5}\left(\int_1^{25025\,421}\frac{1}{t}\,dt\right)^3+2\int_1^{25025\,421}\frac{372-36\sqrt{5}}{\phi^2\,t}\,dt+\sqrt{5}\int_1^{25025\,421}\frac{372-36\sqrt{5}}{\phi^2\,t}\,dt\right)$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3 = 27-\frac{16}{\phi^3}+\frac{36}{\phi^2}-\frac{54}{\phi}-\frac{108\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds-\frac{96\,i}{\phi^2\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds+\frac{144\,i}{\phi\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds-\frac{144\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{\pi^2}+\frac{192\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{\phi\,\pi^2}+\frac{128\,i\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3}{\pi^3}\quad\text{for } -1<\gamma<0$$

(((8*ln(16491600+8533821)+34+e-1)))^3

Input:

$(8\log(16\,491\,600+8\,533\,821)+34+e-1)^3$

$\log(x)$ is the natural logarithm

Exact result:

$(33+e+8\log(25\,025\,421))^3$

Decimal approximation:

$5.08858143785171027640362726898899169801057647012498605\ldots\times10^6$

5088581.437851…

Alternate forms:

$(33+e)^3+512\log^3(25\,025\,421)+192\,(33+e)\log^2(25\,025\,421)+24\,(33+e)^2\log(25\,025\,421)$

$$35\,937 + 3267\,e + 99\,e^2 + e^3 + 512\log^3(25\,025\,421) + 6336\log^2(25\,025\,421) + 192\,e\log^2(25\,025\,421) + 26\,136\log(25\,025\,421) + 1584\,e\log(25\,025\,421) + 24\,e^2\log(25\,025\,421)$$

$$(33 + e + 8\,(\log(3) + \log(139) + \log(60\,013)))^3$$

Alternative representations:

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = (33 + e + 8\log_e(25\,025\,421))^3$$

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = (33 + e + 8\log(a)\log_a(25\,025\,421))^3$$

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = (33 + e - 8\,\text{Li}_1(-25\,025\,420))^3$$

Series representations:

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = \left(33 + e + 8\left(\log(25\,025\,420) - \sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}\right)\right)^3$$

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = \left(33 + e + 8\left(2\,i\,\pi\left\lfloor\frac{\arg(25\,025\,421 - x)}{2\,\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421 - x)^k\,x^{-k}}{k}\right)\right)^3 \quad \text{for } x < 0$$

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = \left(33 + e + 8\left(\log(z_0) + \left\lfloor\frac{\arg(25\,025\,421 - z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty}\frac{(-1)^k\,(25\,025\,421 - z_0)^k\,z_0^{-k}}{k}\right)\right)^3$$

Integral representations:

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = \left(33 + e + 8\int_1^{25\,025\,421}\frac{1}{t}\,dt\right)^3$$

$$(8\log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3 = \left(33 + e - \frac{4\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{25\,025\,420^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3 \quad \text{for } -1 < \gamma < 0$$

(((8*ln(16491600+8533821)-(2*1/golden ratio))))^3+(((8*ln(16491600+8533821)-(2/golden ratio)+3)))^3 - (((8*ln(16491600+8533821)+34+e-1)))^3

Input:

$$\left(8 \log(16\,491\,600 + 8\,533\,821) - 2 \times \frac{1}{\phi}\right)^3 + \left(8 \log(16\,491\,600 + 8\,533\,821) - \frac{2}{\phi} + 3\right)^3 - (8 \log(16\,491\,600 + 8\,533\,821) + 34 + e - 1)^3$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\left(8 \log(25\,025\,421) - \frac{2}{\phi}\right)^3 + \left(-\frac{2}{\phi} + 3 + 8 \log(25\,025\,421)\right)^3 - (33 + e + 8 \log(25\,025\,421))^3$$

Decimal approximation:

5139.493996210316353656748875931676887035340151290657561399...

5139.4939962…

Alternate forms:

$$\left(1 - \sqrt{5} + 8 \log(25\,025\,421)\right)^3 + \left(4 - \sqrt{5} + 8 \log(25\,025\,421)\right)^3 - (33 + e + 8 \log(25\,025\,421))^3$$

$$\left(8 \log(25\,025\,421) - \frac{4}{1 + \sqrt{5}}\right)^3 + \left(3 - \frac{4}{1 + \sqrt{5}} + 8 \log(25\,025\,421)\right)^3 - (33 + e + 8 \log(25\,025\,421))^3$$

$$-\frac{16}{\phi^3} + \frac{36}{\phi^2} - \frac{54}{\phi} - \frac{768 \log^2(25\,025\,421)}{\phi} + \frac{192 \log(25\,025\,421)}{\phi^2} - \frac{288 \log(25\,025\,421)}{\phi} - 35\,910 - 3267 e - 99 e^2 - e^3 + 512 \log^3(25\,025\,421) - 5760 \log^2(25\,025\,421) - 192 e \log^2(25\,025\,421) - 25\,920 \log(25\,025\,421) - 1584 e \log(25\,025\,421) - 24 e^2 \log(25\,025\,421)$$

Alternative representations:

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3=-(33+e+8\log_e(25025421))^3+\left(8\log_e(25025421)-\frac{2}{\phi}\right)^3+\left(3+8\log_e(25025421)-\frac{2}{\phi}\right)^3$$

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3=-(33+e+8\log(a)\log_a(25025421))^3+\left(8\log(a)\log_a(25025421)-\frac{2}{\phi}\right)^3+\left(3+8\log(a)\log_a(25025421)-\frac{2}{\phi}\right)^3$$

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3=-(33+e-8\,\mathrm{Li}_1(-25025420))^3+\left(-8\,\mathrm{Li}_1(-25025420)-\frac{2}{\phi}\right)^3+\left(3-8\,\mathrm{Li}_1(-25025420)-\frac{2}{\phi}\right)^3$$

Series representations:

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3=-\left(33+e+8\left(\log(25025420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25025420}\right)^k}{k}\right)\right)^3+\left(-\frac{2}{\phi}+8\left(\log(25025420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25025420}\right)^k}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(\log(25025420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25025420}\right)^k}{k}\right)\right)^3$$

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3 = -\left(33+e+8\left(2 i\pi\left\lfloor\frac{\arg(25025421-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k (25025421-x)^k x^{-k}}{k}\right)\right)^3+\left(-\frac{2}{\phi}+8\left(2 i\pi\left\lfloor\frac{\arg(25025421-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k (25025421-x)^k x^{-k}}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(2 i\pi\left\lfloor\frac{\arg(25025421-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k (25025421-x)^k x^{-k}}{k}\right)\right)^3 \text{ for } x<0$$

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3 = -\left(33+e+8\left(\log(z_0)+\left\lfloor\frac{\arg(25025421-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k (25025421-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(-\frac{2}{\phi}+8\left(\log(z_0)+\left\lfloor\frac{\arg(25025421-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k (25025421-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(\log(z_0)+\left\lfloor\frac{\arg(25025421-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k (25025421-z_0)^k z_0^{-k}}{k}\right)\right)^3$$

(((8*ln(16491600+8533821)-(2*1/golden ratio))))^3+(((8*ln(16491600+8533821)-(2/golden ratio)+3)))^3 - (((8*ln(16491600+8533821)+34+e-1)))^3+144-5+1/golden ratio

where 144 and 5 are Fibonacci numbers

Input:

$$\left(8\log(16491600+8533821)-2\times\frac{1}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3+144-5+\frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi}+\left(8\log(25\,025\,421)-\frac{2}{\phi}\right)^3+\left(-\frac{2}{\phi}+3+8\log(25\,025\,421)\right)^3+139-(33+e+8\log(25\,025\,421))^3$$

Decimal approximation:

5279.112030199066248504953462766042525153060460470463324262...

5279.11203019… result practically equal to the rest mass of B meson 5279.15

Alternate forms:

$$\frac{1}{2}\left(277+\sqrt{5}\right)+\left(1-\sqrt{5}+8\log(25\,025\,421)\right)^3+\left(4-\sqrt{5}+8\log(25\,025\,421)\right)^3-(33+e+8\log(25\,025\,421))^3$$

$$139+\frac{2}{1+\sqrt{5}}+\left(8\log(25\,025\,421)-\frac{4}{1+\sqrt{5}}\right)^3+\left(3-\frac{4}{1+\sqrt{5}}+8\log(25\,025\,421)\right)^3-(33+e+8\log(25\,025\,421))^3$$

$$-\frac{16}{\phi^3}+\frac{36}{\phi^2}-\frac{53}{\phi}-\frac{768\log^2(25\,025\,421)}{\phi}+\frac{192\log(25\,025\,421)}{\phi^2}-\frac{288\log(25\,025\,421)}{\phi}-35\,771-3267\,e-99\,e^2-e^3+512\log^3(25\,025\,421)-5760\log^2(25\,025\,421)-192\,e\log^2(25\,025\,421)-25\,920\log(25\,025\,421)-1584\,e\log(25\,025\,421)-24\,e^2\log(25\,025\,421)$$

Alternative representations:

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3-(8\log(16\,491\,600+8\,533\,821)+34+e-1)^3+144-5+\frac{1}{\phi}=139+\frac{1}{\phi}-(33+e+8\log_e(25\,025\,421))^3+\left(8\log_e(25\,025\,421)-\frac{2}{\phi}\right)^3+\left(3+8\log_e(25\,025\,421)-\frac{2}{\phi}\right)^3$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3-(8\log(16\,491\,600+8\,533\,821)+34+e-1)^3+144-5+\frac{1}{\phi}=139+\frac{1}{\phi}-(33+e+8\log(a)\log_a(25\,025\,421))^3+\left(8\log(a)\log_a(25\,025\,421)-\frac{2}{\phi}\right)^3+\left(3+8\log(a)\log_a(25\,025\,421)-\frac{2}{\phi}\right)^3$$

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3-(8\log(16\,491\,600+8\,533\,821)+34+e-1)^3+144-5+\frac{1}{\phi}=139+\frac{1}{\phi}-(33+e-8\,\text{Li}_1(-25\,025\,420))^3+\left(-8\,\text{Li}_1(-25\,025\,420)-\frac{2}{\phi}\right)^3+\left(3-8\,\text{Li}_1(-25\,025\,420)-\frac{2}{\phi}\right)^3$$

Series representations:

$$\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}\right)^3+\left(8\log(16\,491\,600+8\,533\,821)-\frac{2}{\phi}+3\right)^3-(8\log(16\,491\,600+8\,533\,821)+34+e-1)^3+144-5+\frac{1}{\phi}=139+\frac{1}{\phi}-\left(33+e+8\left(\log(25\,025\,420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}\right)\right)^3+\left(-\frac{2}{\phi}+8\left(\log(25\,025\,420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(\log(25\,025\,420)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{25\,025\,420}\right)^k}{k}\right)\right)^3$$

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3+144-5+\frac{1}{\phi}=$$

$$139+\frac{1}{\phi}-\left(33+e+8\left(2i\pi\left\lfloor\frac{\arg(25025421-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(25025421-x)^k x^{-k}}{k}\right)\right)^3+\left(-\frac{2}{\phi}+8\left(2i\pi\left\lfloor\frac{\arg(25025421-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(25025421-x)^k x^{-k}}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(2i\pi\left\lfloor\frac{\arg(25025421-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(25025421-x)^k x^{-k}}{k}\right)\right)^3$$

for $x < 0$

$$\left(8\log(16491600+8533821)-\frac{2}{\phi}\right)^3+\left(8\log(16491600+8533821)-\frac{2}{\phi}+3\right)^3-(8\log(16491600+8533821)+34+e-1)^3+144-5+\frac{1}{\phi}=$$

$$139+\frac{1}{\phi}-\left(33+e+8\left(\log(z_0)+\left\lfloor\frac{\arg(25025421-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(25025421-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(-\frac{2}{\phi}+8\left(\log(z_0)+\left\lfloor\frac{\arg(25025421-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(25025421-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(3-\frac{2}{\phi}+8\left(\log(z_0)+\left\lfloor\frac{\arg(25025421-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(25025421-z_0)^k z_0^{-k}}{k}\right)\right)^3$$

Now, we have:

50064 and 25353

ln(50064+25353)

Input:

$\log(50064+25353)$

$\log(x)$ is the natural logarithm

Exact result:

$\log(75417)$

Decimal approximation:

11.23078799277379794286811097930090595858924233470301808893...

11.23078799…

Property:

$\log(75417)$ is a transcendental number

Alternate form:

$\log(3) + \log(23) + \log(1093)$

Alternative representations:

$\log(50064 + 25353) = \log_e(75417)$

$\log(50064 + 25353) = \log(a)\log_a(75417)$

$\log(50064 + 25353) = -\text{Li}_1(-75416)$

Integral representations:

$$\log(50064 + 25353) = \int_1^{75417} \frac{1}{t}\, dt$$

$$\log(50064 + 25353) = -\frac{i}{2\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds \quad \text{for } -1 < \gamma < 0$$

Note that:

ln(50064+25353)+1/golden ratio

Input:

$$\log(50064 + 25353) + \frac{1}{\phi}$$

$\log(x)$ is the natural logarithm

ϕ is the golden ratio

Exact result:

$$\frac{1}{\phi} + \log(75417)$$

Decimal approximation:

11.84882198152369279107269781366654407630955151450878095107...

11.84882198… result practically equal to the black hole entropy 11.8477

Property:

$\frac{1}{\phi} + \log(75417)$ is a transcendental number

Alternate forms:

$$\frac{1}{2}\left(\sqrt{5} - 1\right) + \log(75417)$$

$$\frac{2}{1+\sqrt{5}} + \log(75417)$$

$$\frac{\phi(\log(3) + \log(23) + \log(1093)) + 1}{\phi}$$

Alternative representations:

$$\log(50064 + 25353) + \frac{1}{\phi} = \log_e(75417) + \frac{1}{\phi}$$

$$\log(50064 + 25353) + \frac{1}{\phi} = \log(a)\log_a(75417) + \frac{1}{\phi}$$

$$\log(50064 + 25353) + \frac{1}{\phi} = -\text{Li}_1(-75416) + \frac{1}{\phi}$$

Series representations:

$$\log(50064 + 25353) + \frac{1}{\phi} = \frac{1}{\phi} + \log(75416) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k}$$

$$\log(50064 + 25353) + \frac{1}{\phi} = \frac{1}{\phi} + 2 i \pi \left\lfloor \frac{\arg(75417 - x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(50064+25353)+\frac{1}{\phi}=\frac{1}{\phi}+\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$\log(50064+25353)+\frac{1}{\phi}=\frac{1}{\phi}+\int_1^{75417}\frac{1}{t}\,dt$$

$$\log(50064+25353)+\frac{1}{\phi}=\frac{1}{\phi}-\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

13*ln(50064+25353)-11

where 13 is a Fibonacci number and 11 is a Lucas number

Input:

$13\log(50064+25353)-11$

$\log(x)$ is the natural logarithm

Exact result:

$13\log(75417)-11$

Decimal approximation:

135.0002439060593732572854427309117774616601503511392351562...

135.000243906… ≈ 135 (Ramanujan taxicab number)

Property:

$-11+13\log(75417)$ is a transcendental number

Alternate forms:

$-11+13\log(3)+13\log(23)+13\log(1093)$

$13(\log(3)+\log(23)+\log(1093))-11$

Alternative representations:

$$13\log(50\,064+25\,353)-11=-11+13\log_e(75\,417)$$

$$13\log(50\,064+25\,353)-11=-11+13\log(a)\log_a(75\,417)$$

$$13\log(50\,064+25\,353)-11=-11-13\,\text{Li}_1(-75\,416)$$

Series representations:

$$13\log(50\,064+25\,353)-11=-11+13\log(75\,416)-13\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}$$

$$13\log(50\,064+25\,353)-11=$$
$$-11+26\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+13\log(x)-13\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\quad\text{for } x<0$$

$$13\log(50\,064+25\,353)-11=-11+13\left\lfloor\frac{\arg(75\,417-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+$$
$$13\log(z_0)+13\left\lfloor\frac{\arg(75\,417-z_0)}{2\,\pi}\right\rfloor\log(z_0)-13\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-z_0)^k\,z_0^{-k}}{k}$$

Integral representations:

$$13\log(50\,064+25\,353)-11=-11+13\int_1^{75\,417}\frac{1}{t}\,dt$$

$$13\log(50\,064+25\,353)-11=-11-\frac{13\,i}{2\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{75\,416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$
$$\text{for } -1<\gamma<0$$

13*ln(50064+25353)-11+3

where 3 is a Lucas/Fibonacci number

Input:

$$13\log(50\,064+25\,353)-11+3$$

log(x) is the natural logarithm

Exact result:

$$13\log(75\,417)-8$$

Decimal approximation:

138.0002439060593732572854427309117774616601503511392351562...

138.000243906… ≈ 138 (Ramanujan taxicab number)

Property:

$-8 + 13 \log(75417)$ is a transcendental number

Alternate forms:

$-8 + 13 \log(3) + 13 \log(23) + 13 \log(1093)$

$13 (\log(3) + \log(23) + \log(1093)) - 8$

Alternative representations:

$13 \log(50064 + 25353) - 11 + 3 = -8 + 13 \log_e(75417)$

$13 \log(50064 + 25353) - 11 + 3 = -8 + 13 \log(a) \log_a(75417)$

$13 \log(50064 + 25353) - 11 + 3 = -8 - 13 \operatorname{Li}_1(-75416)$

Series representations:

$$13 \log(50064 + 25353) - 11 + 3 = -8 + 13 \log(75416) - 13 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k}$$

$$13 \log(50064 + 25353) - 11 + 3 = -8 + 26 i \pi \left\lfloor \frac{\arg(75417 - x)}{2 \pi} \right\rfloor + 13 \log(x) - 13 \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

$$13 \log(50064 + 25353) - 11 + 3 = -8 + 13 \left\lfloor \frac{\arg(75417 - z_0)}{2 \pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + 13 \log(z_0) + 13 \left\lfloor \frac{\arg(75417 - z_0)}{2 \pi} \right\rfloor \log(z_0) - 13 \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$13 \log(50064 + 25353) - 11 + 3 = -8 + 13 \int_1^{75417} \frac{1}{t} \, dt$$

$$13 \log(50\,064 + 25\,353) - 11 + 3 = -8 - \frac{13\,i}{2\,\pi} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{75\,416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,d\,s$$

for $-1 < \gamma < 0$

13*ln(50064+25353)+21+5

where 21 and 5 are Fibonacci numbers

Input:

$13 \log(50\,064 + 25\,353) + 21 + 5$

$\log(x)$ is the natural logarithm

Exact result:

$26 + 13 \log(75\,417)$

Decimal approximation:

172.0002439060593732572854427309117774616601503511392351562...

172.000243906… ≈ 172 (Ramanujan taxicab number)

Property:

$26 + 13 \log(75\,417)$ is a transcendental number

Alternate forms:

$13\,(2 + \log(75\,417))$

$13\,(2 + \log(3) + \log(23) + \log(1093))$

$26 + 13\,(\log(3) + \log(23) + \log(1093))$

Alternative representations:

$13 \log(50\,064 + 25\,353) + 21 + 5 = 26 + 13 \log_e(75\,417)$

$13 \log(50\,064 + 25\,353) + 21 + 5 = 26 + 13 \log(a) \log_a(75\,417)$

$13 \log(50\,064 + 25\,353) + 21 + 5 = 26 - 13\,\text{Li}_1(-75\,416)$

Series representations:

$$13\log(50064+25353)+21+5=26+13\log(75416)-13\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}$$

$$13\log(50064+25353)+21+5=26+26\,i\,\pi\left\lfloor\frac{\arg(75417-x)}{2\pi}\right\rfloor+13\log(x)-13\sum_{k=1}^{\infty}\frac{(-1)^k(75417-x)^k x^{-k}}{k}\quad\text{for } x<0$$

$$13\log(50064+25353)+21+5=26+13\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+13\log(z_0)+13\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\log(z_0)-13\sum_{k=1}^{\infty}\frac{(-1)^k(75417-z_0)^k z_0^{-k}}{k}$$

Integral representations:

$$13\log(50064+25353)+21+5=26+13\int_1^{75417}\frac{1}{t}\,dt$$

$$13\log(50064+25353)+21+5=26-\frac{13\,i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

((13*ln(50064+25353)-11))^3+((13*ln(50064+25353)-11+3))^3

Input:

$$(13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3$$

log(x) is the natural logarithm

Exact result:

$$(13\log(75417)-11)^3+(13\log(75417)-8)^3$$

Decimal approximation:

$5.088474270453502820586710872144393284406021689238630 42\ldots\times10^6$

Decimal form:

5088474.270453502820586710872144393284406021689238630 42

5088474.270453…

Property:

$(-11+13\log(75417))^3+(-8+13\log(75417))^3$ is a transcendental number

Alternate forms:

$$-1843 + 4394 \log^3(75417) - 9633 \log^2(75417) + 7215 \log(75417)$$

$$(26 \log(75417) - 19) \left(97 + 169 \log^2(75417) - 247 \log(75417)\right)$$

$$-1843 + 4394 \log^3(3) + 4394 \log^3(23) + 4394 \log^3(1093) - 9633 \log^2(1093) + 507 \log^2(23) (26 \log(1093) - 19) + 507 \log^2(3) (-19 + 26 \log(23) + 26 \log(1093)) + 39 \log(23) \left(185 + 338 \log^2(1093) - 494 \log(1093)\right) + 39 \log(3) \left(185 + 338 \log^2(23) + 338 \log^2(1093) - 494 \log(1093) + 26 \log(23) (26 \log(1093) - 19)\right) + 7215 \log(1093)$$

Alternative representations:

$$(13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3 = \left(-11 + 13 \log_e(75417)\right)^3 + \left(-8 + 13 \log_e(75417)\right)^3$$

$$(13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3 = (-11 + 13 \log(a) \log_a(75417))^3 + (-8 + 13 \log(a) \log_a(75417))^3$$

$$(13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3 = (-11 - 13 \operatorname{Li}_1(-75416))^3 + (-8 - 13 \operatorname{Li}_1(-75416))^3$$

Series representations:

$$(13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3 = \left(-19 + 26 \log(75416) - 26 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k}\right) \left(97 - 247 \log(75416) + 169 \log^2(75416) + 247 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k} - 338 \log(75416) \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k} + 169 \left(\sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k}\right)^2\right)$$

$$(13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3 = \left(-11 + 13 \left(\log(z_0) + \left\lfloor \frac{\arg(75417 - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - z_0)^k z_0^{-k}}{k}\right)\right)^3 + \left(-8 + 13 \left(\log(z_0) + \left\lfloor \frac{\arg(75417 - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - z_0)^k z_0^{-k}}{k}\right)\right)^3$$

$$(13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3 = \left(-19+26\left(\text{Res}_{s=0}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)+26\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right) \left(97-247\left(\text{Res}_{s=0}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)+169\left(\text{Res}_{s=0}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^2 - 247\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+338\left(\text{Res}_{s=0}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right) \sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+169\left(\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^2\right)$$

Integral representations:

$$(13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3 = \left(-19+26\int_1^{75417}\frac{1}{t}\,dt\right)\left(97-247\int_1^{75417}\frac{1}{t}\,dt+169\left(\int_1^{75417}\frac{1}{t}\,dt\right)^2\right)$$

$$(13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3 = -\frac{1}{4\pi^3}\left(19\pi+13i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right) \left(388\pi^2+494i\pi\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds - 169\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2\right) \quad \text{for } -1<\gamma<0$$

We note that, from the formula of coefficients of the '5th order' mock theta function $\psi_1(q)$: (A053261 OEIS Sequence)

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

for n = 577-0.6, we obtain:

sqrt(golden ratio) * exp(Pi*sqrt((577-0.6)/15)) / (2*5^(1/4)*sqrt((577-0.6))) + (7+76+199+521+5778)

where 7, 76, 199, 521 and 5778 are Lucas numbers

Input:

$$\sqrt{\phi}\times\frac{\exp\left(\pi\sqrt{\frac{577-0.6}{15}}\right)}{2\sqrt[4]{5}\sqrt{577-0.6}}+(7+76+199+521+5778)$$

ϕ is the golden ratio

Result:

$5.0884742\ldots\times 10^6$

5088474.2….

Series representations:

$$\frac{\sqrt{\phi}\exp\left(\pi\sqrt{\frac{577-0.6}{15}}\right)}{2\sqrt[4]{5}\sqrt{577-0.6}}+(7+76+199+521+5778)=\left(65810\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(576.4-z_0)^k z_0^{-k}}{k!}+5^{3/4}\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(38.4267-z_0)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\Bigg/\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(576.4-z_0)^k z_0^{-k}}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\exp\left(\pi\sqrt{\frac{577-0.6}{15}}\right)}{2\sqrt[4]{5}\sqrt{577-0.6}}+(7+76+199+521+5778)=\left(65810\exp\left(i\pi\left\lfloor\frac{\arg(576.4-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(576.4-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+5^{3/4}\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg(38.4267-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(38.4267-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\Bigg/\left(10\exp\left(i\pi\left\lfloor\frac{\arg(576.4-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(576.4-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$\frac{\sqrt{\phi}\,\exp\left(\pi\sqrt{\frac{577-0.6}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{577-0.6}} + (7+76+199+521+5778) =$$

$$\left(\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor} z_0^{-1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor} \left(65810\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(576.4-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(576.4-z_0)^k z_0^{-k}}{k!} + 5^{3/4}\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(38.4267-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(38.4267-z_0)/(2\pi)\rfloor)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(38.4267-z_0)^k z_0^{-k}}{k!}\right) \left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor} z_0^{1/2\lfloor\arg(\phi-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\right) / \left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(576.4-z_0)^k z_0^{-k}}{k!}\right)$$

$n!$ is the factorial function

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

((13*ln(50064+25353)+21+5))^3-1

Input:

$(13\log(50\,064+25\,353)+21+5)^3-1$

$\log(x)$ is the natural logarithm

Exact result:

$(26+13\log(75\,417))^3-1$

Decimal approximation:

$5.088468647181278435392888833332274633520728416902051 87\ldots\times10^6$

Decimal form:

5088468.647181278435392888833332274633520728416902051 87

5088468.6471812…

Property:

$-1+(26+13\log(75\,417))^3$ is a transcendental number

Alternate forms:

$$17575 + 2197 \log^3(75417) + 13182 \log^2(75417) + 26364 \log(75417)$$

$$(25 + 13 \log(75417)) \left(703 + 169 \log^2(75417) + 689 \log(75417)\right)$$

$$17575 + 2197 \log^3(3) + 2197 \log^3(23) + 2197 \log^3(1093) + 13182 \log^2(1093) + 6591 \log^2(23) (2 + \log(1093)) + 6591 \log^2(3) (2 + \log(23) + \log(1093)) + 26364 \log(1093) + 6591 \log(23) (2 + \log(1093))^2 + 6591 \log(3) (2 + \log(23) + \log(1093))^2$$

Alternative representations:

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + \left(26 + 13 \log_e(75417)\right)^3$$

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + (26 + 13 \log(a) \log_a(75417))^3$$

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + (26 - 13 \operatorname{Li}_1(-75416))^3$$

Series representations:

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + 2197 \left(2 + \log(75416) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75416}\right)^k}{k}\right)^3$$

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + \left(26 + 13 \left(2 i \pi \left\lfloor \frac{\arg(75417 - x)}{2 \pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - x)^k x^{-k}}{k}\right)\right)^3 \quad \text{for } x < 0$$

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + \left(26 + 13 \left(\log(z_0) + \left\lfloor \frac{\arg(75417 - z_0)}{2 \pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (75417 - z_0)^k z_0^{-k}}{k}\right)\right)^3$$

Integral representations:

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + \left(26 + 13 \int_1^{75417} \frac{1}{t} \, dt\right)^3$$

$$(13 \log(50064 + 25353) + 21 + 5)^3 - 1 = -1 + \left(26 - \frac{13 i}{2 \pi} \int_{-i \infty + \gamma}^{i \infty + \gamma} \frac{75416^{-s} \, \Gamma(-s)^2 \, \Gamma(1 + s)}{\Gamma(1 - s)} \, ds\right)^3 \quad \text{for } -1 < \gamma < 0$$

((((13*ln(50064+25353)-11))^3+((13*ln(50064+25353)-11+3))^3)) - ((((13*ln(50064+25353)+21+5))^3-1))

Input:

$$\left((13 \log(50\,064 + 25\,353) - 11)^3 + \left(13 \log(50\,064 + 25\,353) - 11 + 3\right)^3\right) - \left((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1\right)$$

log(x) is the natural logarithm

Exact result:

$$1 + (13 \log(75\,417) - 11)^3 + (13 \log(75\,417) - 8)^3 - (26 + 13 \log(75\,417))^3$$

Decimal approximation:

5.623272224385193822038812118650885293272336578547479653437...

5.6232722243…

Property:

$1 + (-11 + 13 \log(75\,417))^3 + (-8 + 13 \log(75\,417))^3 - (26 + 13 \log(75\,417))^3$ is a transcendental number

Alternate forms:

$$-19\,418 + 2197 \log^3(75\,417) - 22\,815 \log^2(75\,417) - 19\,149 \log(75\,417)$$

$$(13 \log(75\,417) - 146)\left(133 + 169 \log^2(75\,417) + 143 \log(75\,417)\right)$$

$$(13 \log(75\,417) - 146)(133 + 13 \log(75\,417)(11 + 13 \log(75\,417)))$$

Alternative representations:

$$\left((13 \log(50\,064 + 25\,353) - 11)^3 + \left(13 \log(50\,064 + 25\,353) - 11 + 3\right)^3\right) - \left((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1\right) = 1 + \left(-11 + 13 \log_e(75\,417)\right)^3 + \left(-8 + 13 \log_e(75\,417)\right)^3 - \left(26 + 13 \log_e(75\,417)\right)^3$$

$$\left((13 \log(50\,064 + 25\,353) - 11)^3 + \left(13 \log(50\,064 + 25\,353) - 11 + 3\right)^3\right) - \left((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1\right) = 1 + (-11 + 13 \log(a) \log_a(75\,417))^3 + (-8 + 13 \log(a) \log_a(75\,417))^3 - (26 + 13 \log(a) \log_a(75\,417))^3$$

$$\left((13 \log(50\,064 + 25\,353) - 11)^3 + \left(13 \log(50\,064 + 25\,353) - 11 + 3\right)^3\right) - \left((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1\right) = 1 + (-11 - 13 \operatorname{Li}_1(-75\,416))^3 + (-8 - 13 \operatorname{Li}_1(-75\,416))^3 - (26 - 13 \operatorname{Li}_1(-75\,416))^3$$

Series representations:

$$((13 \log(50\,064+25\,353)-11)^3+(13 \log(50\,064+25\,353)-11+3)^3)-((13 \log(50\,064+25\,353)+21+5)^3-1) = \left(-146+13 \log(75\,416)-13 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right) \left(133+143 \log(75\,416)+169 \log^2(75\,416)-143 \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k} - 338 \log(75\,416) \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k}+169 \left(\sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)^2\right)$$

$$((13 \log(50\,064+25\,353)-11)^3+(13 \log(50\,064+25\,353)-11+3)^3)-((13 \log(50\,064+25\,353)+21+5)^3-1) = \left(-146+13 \left(\text{Res}_{s=0} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)+13 \sum_{j=1}^{\infty} \text{Res}_{s=j} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right) \left(133+143 \left(\text{Res}_{s=0} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)+ 169 \left(\text{Res}_{s=0} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^2+143 \sum_{j=1}^{\infty} \text{Res}_{s=j} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+ 338 \left(\text{Res}_{s=0} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right) \sum_{j=1}^{\infty} \text{Res}_{s=j} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+ 169 \left(\sum_{j=1}^{\infty} \text{Res}_{s=j} \frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^2\right)$$

$$((13 \log(50\,064+25\,353)-11)^3+(13 \log(50\,064+25\,353)-11+3)^3)-((13 \log(50\,064+25\,353)+21+5)^3-1) = \left(146\, i+26\, \pi \left\lfloor \frac{\arg(75\,417-x)}{2\, \pi} \right\rfloor-13\, i \log(x)+13\, i \sum_{k=1}^{\infty} \frac{(-1)^k\,(75\,417-x)^k\, x^{-k}}{k}\right) \left(133\, i-286\, \pi \left\lfloor \frac{\arg(75\,417-x)}{2\, \pi} \right\rfloor-676\, i\, \pi^2 \left\lfloor \frac{\arg(75\,417-x)}{2\, \pi} \right\rfloor^2+ 143\, i \log(x)-676\, \pi \left\lfloor \frac{\arg(75\,417-x)}{2\, \pi} \right\rfloor \log(x)+ 169\, i \log^2(x)-143\, i \sum_{k=1}^{\infty} \frac{(-1)^k\,(75\,417-x)^k\, x^{-k}}{k}+ 676\, \pi \left\lfloor \frac{\arg(75\,417-x)}{2\, \pi} \right\rfloor \sum_{k=1}^{\infty} \frac{(-1)^k\,(75\,417-x)^k\, x^{-k}}{k}-338\, i \log(x) \sum_{k=1}^{\infty} \frac{(-1)^k\,(75\,417-x)^k\, x^{-k}}{k}+169\, i \left(\sum_{k=1}^{\infty} \frac{(-1)^k\,(75\,417-x)^k\, x^{-k}}{k}\right)^2\right) \quad \text{for } x<0$$

Integral representations:

$$((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)-((13\log(50064+25353)+21+5)^3-1) = \left(-146+13\int_1^{75417}\frac{1}{t}\,dt\right)\left(133+143\int_1^{75417}\frac{1}{t}\,dt+169\left(\int_1^{75417}\frac{1}{t}\,dt\right)^2\right)$$

$$((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)-((13\log(50064+25353)+21+5)^3-1) = -\frac{1}{8\pi^3}\left(292\pi+13i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\left(532\pi^2-286i\pi\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds-169\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2\right) \text{ for } -1<\gamma<0$$

From which:

1/10^27((((1+1/((((((((13*ln(50064+25353)-11))^3+((13*ln(50064+25353)-11+3))^3)) - ((((13*ln(50064+25353)+21+5))^3-1))))))^1/4+(21+2)/10^3))))

Input:

$$\frac{1}{10^{27}}\left(1+1/(((((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)-((13\log(50064+25353)+21+5)^3-1))\text{^}(1/4))+\frac{21+2}{10^3}\right)$$

log(x) is the natural logarithm

Exact result:

$$\frac{\frac{1023}{1000}+\frac{1}{\sqrt[4]{1+(13\log(75417)-11)^3+(13\log(75417)-8)^3-(26+13\log(75417))^3}}}{1000000000000000000000000000}$$

Decimal approximation:

$1.672385703040965117602648597013254303664270627485315 2\ldots\times10^{-27}$

1.6723857…*10^{-27} result practically to the proton mass

Property:

$$\frac{\frac{1023}{1000}+\frac{1}{\sqrt[4]{1+(-11+13\log(75417))^3+(-8+13\log(75417))^3-(26+13\log(75417))^3}}}{1000000000000000000000000000}$$

is a transcendental number

Alternate forms:

$$\frac{\frac{1023}{1000}+\frac{1}{\sqrt[4]{-19418+2197\log^3(75417)-22815\log^2(75417)-19149\log(75417)}}}{1000000000000000000000000000}$$

$$\frac{\frac{1023}{1000}+\frac{1}{\sqrt[4]{(13\log(75417)-146)(133+13\log(75417)(11+13\log(75417)))}}}{1000000000000000000000000000}$$

$$\frac{1023}{1000000000000000000000000000000}+1\Big/\left(1000000000000000000000000000\sqrt[4]{1+(13\log(75417)-11)^3+(13\log(75417)-8)^3-(26+13\log(75417))^3}\right)$$

Alternative representations:

$$\frac{1}{10^{27}}\left(1+1/((((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)-((13\log(50064+25353)+21+5)^3-1))\wedge(1/4))+\frac{21+2}{10^3}\right)=\frac{1+\frac{23}{10^3}+\frac{1}{\sqrt[4]{1+(-11+13\log_e(75417))^3+(-8+13\log_e(75417))^3-(26+13\log_e(75417))^3}}}{10^{27}}$$

$$\frac{1}{10^{27}}\left(1+1/((((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)-((13\log(50064+25353)+21+5)^3-1))\wedge(1/4))+\frac{21+2}{10^3}\right)=\frac{1+\frac{23}{10^3}+\frac{1}{\sqrt[4]{1+(-11-13\,\mathrm{Li}_1(-75416))^3+(-8-13\,\mathrm{Li}_1(-75416))^3-(26-13\,\mathrm{Li}_1(-75416))^3}}}{10^{27}}$$

$$\frac{1}{10^{27}}\left(1+1/((((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)-((13\log(50064+25353)+21+5)^3-1))\wedge(1/4))+\frac{21+2}{10^3}\right)=\frac{1+\frac{23}{10^3}+\frac{1}{\sqrt[4]{1+(-11+13\log(a)\log_a(75417))^3+(-8+13\log(a)\log_a(75417))^3-(26+13\log(a)\log_a(75417))^3}}}{10^{27}}$$

Series representations:

$$\frac{1}{10^{27}}\left(1+1/((((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3)-((13\log(50\,064+25\,353)+21+5)^3-1))\wedge(1/4))+\frac{21+2}{10^3}\right)=$$

$$\left(1000+1023\left(1+\left(-11+13\left(\log(75\,416)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3+\left(-8+13\left(\log(75\,416)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3-\left(26+13\left(\log(75\,416)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3\right)\wedge(1/4)\right)\Big/$$

$$\left(1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(1+\left(-11+13\left(\log(75\,416)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3+\left(-8+13\left(\log(75\,416)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3-\left(26+13\left(\log(75\,416)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3\right)\wedge(1/4)\right)$$

$$\frac{1}{10^{27}}\left(1+1/((((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3)-((13\log(50\,064+25\,353)+21+5)^3-1))\text{ ^ }(1/4))+\frac{21+2}{10^3}\right)=$$

$$\frac{1023}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}+1\Bigg/\left(1\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(1+\left(-11+13\left(2\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\right)^3+\left(-8+13\left(2\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\right)^3-\left(26+13\left(2\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\right)^3\right)\text{ ^ }(1/4)\right)\quad\text{for } x<0$$

$$\frac{1}{10^{27}}\left(1+1/((((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3)-((13\log(50\,064+25\,353)+21+5)^3-1))\text{ ^ }(1/4))+\frac{21+2}{10^3}\right)=$$

$$\frac{1023}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}+1\Bigg/\left(1\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(1+\left(-11+13\left(\log(z_0)+\left\lfloor\frac{\arg(75\,417-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-z_0)^k\,z_0^{-k}}{k}\right)\right)^3+\left(-8+13\left(\log(z_0)+\left\lfloor\frac{\arg(75\,417-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-z_0)^k\,z_0^{-k}}{k}\right)\right)^3-\left(26+13\left(\log(z_0)+\left\lfloor\frac{\arg(75\,417-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-z_0)^k\,z_0^{-k}}{k}\right)\right)^3\right)\text{ ^ }(1/4)\right)$$

3((((((((13*ln(50064+25353)-11))^3+((13*ln(50064+25353)-11+3))^3)) - ((((13*ln(50064+25353)+21+5))^3-1))))))

Input:

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right)$$

log(x) is the natural logarithm

Exact result:

$$3\left(1+(13\log(75\,417)-11)^3+(13\log(75\,417)-8)^3-(26+13\log(75\,417))^3\right)$$

Decimal approximation:

16.869816673155581466116436355952655879817009735642438960 31...

16.8698166… result practically equal to the black hole entropy 16.8741 and very near to the mass of the hypothetical light particle, the boson m_X = 16.84 MeV

Property:

$$3\left(1+(-11+13\log(75\,417))^3+(-8+13\log(75\,417))^3-(26+13\log(75\,417))^3\right)$$ is a transcendental number

Alternate forms:

$$-58\,254+6591\log^3(75\,417)-68\,445\log^2(75\,417)-57\,447\log(75\,417)$$

$$3\,(13\log(75\,417)-146)\left(133+169\log^2(75\,417)+143\log(75\,417)\right)$$

$$3\,(13\log(75\,417)-146)\,(133+13\log(75\,417)\,(11+13\log(75\,417)))$$

Alternative representations:

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right)=3\left(1+\left(-11+13\log_e(75\,417)\right)^3+\left(-8+13\log_e(75\,417)\right)^3-\left(26+13\log_e(75\,417)\right)^3\right)$$

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right)=3\left(1+(-11+13\log(a)\log_a(75\,417))^3+(-8+13\log(a)\log_a(75\,417))^3-(26+13\log(a)\log_a(75\,417))^3\right)$$

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right) = 3\left(1+(-11-13\,\text{Li}_1(-75\,416))^3+(-8-13\,\text{Li}_1(-75\,416))^3-(26-13\,\text{Li}_1(-75\,416))^3\right)$$

Series representations:

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right) = 3\left(-146+13\log(75\,416)-13\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\left(133+143\log(75\,416)+169\log^2(75\,416)-143\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}-338\log(75\,416)\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}+169\left(\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)^2\right)$$

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right) = 3\left(-146+13\left(\text{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)+13\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\left(133+143\left(\text{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)+169\left(\text{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^2+143\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+338\left(\text{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+169\left(\sum_{j=1}^{\infty}\text{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^2\right)$$

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right)=$$
$$3\left(146\,i+26\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor-13\,i\log(x)+13\,i\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\left(133\,i-286\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor-676\,i\,\pi^2\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor^2+143\,i\log(x)-676\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor\log(x)+169\,i\log^2(x)-143\,i\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}+676\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}-338\,i\log(x)\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}+169\,i\left(\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)^2\right)\quad\text{for } x<0$$

Integral representations:

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right)=3\left(-146+13\int_1^{75\,417}\frac{1}{t}\,dt\right)\left(133+143\int_1^{75\,417}\frac{1}{t}\,dt+169\left(\int_1^{75\,417}\frac{1}{t}\,dt\right)^2\right)$$

$$3\left(\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)-\left((13\log(50\,064+25\,353)+21+5)^3-1\right)\right)=-\frac{1}{8\,\pi^3}\,3\left(292\,\pi+13\,i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{75\,416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)\left(532\,\pi^2-286\,i\,\pi\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{75\,416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds-169\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{75\,416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2\right)\quad\text{for } -1<\gamma<0$$

Summing, we obtain:

((((13*ln(50064+25353)-11))^3+((13*ln(50064+25353)-11+3))^3)) + ((((13*ln(50064+25353)+21+5))^3-1))

Input:

$$\left((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3\right)+\left((13\log(50\,064+25\,353)+21+5)^3-1\right)$$

log(x) is the natural logarithm

Exact result:

$$-1+(13\log(75417)-11)^3+(13\log(75417)-8)^3+(26+13\log(75417))^3$$

Decimal approximation:

$$1.0176942917634781255979599705476667917926750106140 6823\ldots\times 10^7$$

1.0176942917…*10^7

Property:

$$-1+(-11+13\log(75417))^3+(-8+13\log(75417))^3+(26+13\log(75417))^3$$
is a transcendental number

Alternate forms:

$$15732+6591\log^3(75417)+3549\log^2(75417)+33579\log(75417)$$

$$15732+39\log(75417)(861+13\log(75417)(7+13\log(75417)))$$

$$3\left(5244+2197\log^3(75417)+1183\log^2(75417)+11193\log(75417)\right)$$

Alternative representations:

$$\left((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3\right)+\left((13\log(50064+25353)+21+5)^3-1\right)=-1+\left(-11+13\log_e(75417)\right)^3+\left(-8+13\log_e(75417)\right)^3+\left(26+13\log_e(75417)\right)^3$$

$$\left((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3\right)+\left((13\log(50064+25353)+21+5)^3-1\right)=-1+(-11+13\log(a)\log_a(75417))^3+(-8+13\log(a)\log_a(75417))^3+(26+13\log(a)\log_a(75417))^3$$

$$\left((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3\right)+\left((13\log(50064+25353)+21+5)^3-1\right)=-1+(-11-13\operatorname{Li}_1(-75416))^3+(-8-13\operatorname{Li}_1(-75416))^3+(26-13\operatorname{Li}_1(-75416))^3$$

Series representations:

$$((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)+((13\log(50064+25353)+21+5)^3-1)=$$
$$3\left(5244+11193\log(75416)+1183\log^2(75416)+2197\log^3(75416)-11193\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}-2366\log(75416)\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}-6591\log^2(75416)\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}+1183\left(\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}\right)^2+6591\log(75416)\left(\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}\right)^2-2197\left(\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{75416}\right)^k}{k}\right)^3\right)$$

$$((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)+((13\log(50064+25353)+21+5)^3-1)=$$
$$-1+\left(-11+13\left(2i\pi\left\lfloor\frac{\arg(75417-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-x)^k x^{-k}}{k}\right)\right)^3+\left(-8+13\left(2i\pi\left\lfloor\frac{\arg(75417-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-x)^k x^{-k}}{k}\right)\right)^3+\left(26+13\left(2i\pi\left\lfloor\frac{\arg(75417-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-x)^k x^{-k}}{k}\right)\right)^3 \quad \text{for } x<0$$

$$((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)+((13\log(50064+25353)+21+5)^3-1)=$$
$$-1+\left(-11+13\left(\log(z_0)+\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(-8+13\left(\log(z_0)+\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-z_0)^k z_0^{-k}}{k}\right)\right)^3+\left(26+13\left(\log(z_0)+\left\lfloor\frac{\arg(75417-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(75417-z_0)^k z_0^{-k}}{k}\right)\right)^3$$

Integral representations:

$$((13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3) + ((13 \log(50064 + 25353) + 21 + 5)^3 - 1) = 3\left(5244 + 11193 \int_1^{75417} \frac{1}{t}\, dt + 1183 \left(\int_1^{75417} \frac{1}{t}\, dt\right)^2 + 2197 \left(\int_1^{75417} \frac{1}{t}\, dt\right)^3\right)$$

$$((13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3) + ((13 \log(50064 + 25353) + 21 + 5)^3 - 1) = \frac{1}{8\pi^3} 3\left(41952\pi^3 - 44772 i \pi^2 \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds - 2366\pi \left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right)^2 + 2197 i \left(\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right)^3\right) \text{ for } -1 < \gamma < 0$$

(((((((13*ln(50064+25353)-11))^3+((13*ln(50064+25353)-11+3))^3)) + ((((13*ln(50064+25353)+21+5))^3-1)))))^1/2-89-5

where 89 and 5 are Fibonacci numbers

Input:

$$\sqrt{((13 \log(50064 + 25353) - 11)^3 + (13 \log(50064 + 25353) - 11 + 3)^3) + ((13 \log(50064 + 25353) + 21 + 5)^3 - 1)} - 89 - 5$$

log(x) is the natural logarithm

Exact result:

$$\sqrt{-1 + (13 \log(75417) - 11)^3 + (13 \log(75417) - 8)^3 + (26 + 13 \log(75417))^3} - 94$$

Decimal approximation:

3096.132116015695870317891458939757567676616810882934913789...

3096.132116… result practically equal to the rest mass of J/Psi meson 3096.916

Property:

$$-94 + \sqrt{-1 + (-11 + 13 \log(75417))^3 + (-8 + 13 \log(75417))^3 + (26 + 13 \log(75417))^3}$$
is a transcendental number

Alternate forms:

$$\sqrt{15732 + 6591 \log^3(75417) + 3549 \log^2(75417) + 33579 \log(75417)} - 94$$

$$\sqrt{15732 + 39 \log(75417)(861 + 13 \log(75417)(7 + 13 \log(75417)))} - 94$$

$$\sqrt{3\,(5244 + 2197 \log^3(75\,417) + 1183 \log^2(75\,417) + 11\,193 \log(75\,417))} - 94$$

Alternative representations:

$$\sqrt{(((13 \log(50\,064 + 25\,353) - 11)^3 + (13 \log(50\,064 + 25\,353) - 11 + 3)^3) + ((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1))} - 89 - 5 = -94 + \sqrt{-1 + (-11 + 13 \log_e(75\,417))^3 + (-8 + 13 \log_e(75\,417))^3 + (26 + 13 \log_e(75\,417))^3}$$

$$\sqrt{(((13 \log(50\,064 + 25\,353) - 11)^3 + (13 \log(50\,064 + 25\,353) - 11 + 3)^3) + ((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1))} - 89 - 5 = -94 + \sqrt{-1 + (-11 - 13\,\mathrm{Li}_1(-75\,416))^3 + (-8 - 13\,\mathrm{Li}_1(-75\,416))^3 + (26 - 13\,\mathrm{Li}_1(-75\,416))^3}$$

$$\sqrt{(((13 \log(50\,064 + 25\,353) - 11)^3 + (13 \log(50\,064 + 25\,353) - 11 + 3)^3) + ((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1))} - 89 - 5 = -94 + \sqrt{(-1 + (-11 + 13 \log(a) \log_a(75\,417))^3 + (-8 + 13 \log(a) \log_a(75\,417))^3 + (26 + 13 \log(a) \log_a(75\,417))^3)}$$

Series representations:

$$\sqrt{(((13 \log(50\,064 + 25\,353) - 11)^3 + (13 \log(50\,064 + 25\,353) - 11 + 3)^3) + ((13 \log(50\,064 + 25\,353) + 21 + 5)^3 - 1))} - 89 - 5 = -94 + \sqrt{\left(-1 + \left(-11 + 13\left(\log(75\,416) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3 + \left(-8 + 13\left(\log(75\,416) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)\right)^3 + 2197\left(2 + \log(75\,416) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{75\,416}\right)^k}{k}\right)^3\right)}$$

$$\sqrt{(((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3)+((13\log(50\,064+25\,353)+21+5)^3-1))}-89-5=-94+\sqrt{\left(-1+\left(-11+13\left(2\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\right)^3+\left(-8+13\left(2\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\right)^3+\left(26+13\left(2\,i\,\pi\left\lfloor\frac{\arg(75\,417-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(75\,417-x)^k\,x^{-k}}{k}\right)\right)^3\right)}$$

for $x < 0$

$$\sqrt{(((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3)+((13\log(50\,064+25\,353)+21+5)^3-1))}-89-5=-94+\sqrt{\left(-1+2197\left(2+\operatorname{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)^3+\left(-11+13\left(\operatorname{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3+\left(-8+13\left(\operatorname{Res}_{s=0}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}+\sum_{j=1}^{\infty}\operatorname{Res}_{s=j}\frac{75\,416^{-s}\,\Gamma(-s)\,\Gamma(1+s)}{s}\right)\right)^3\right)}$$

Integral representations:

$$\sqrt{(((13\log(50\,064+25\,353)-11)^3+(13\log(50\,064+25\,353)-11+3)^3)+((13\log(50\,064+25\,353)+21+5)^3-1))}-89-5=-94+\sqrt{3}\sqrt{5244+11\,193\int_1^{75\,417}\frac{1}{t}\,dt+1183\left(\int_1^{75\,417}\frac{1}{t}\,dt\right)^2+2197\left(\int_1^{75\,417}\frac{1}{t}\,dt\right)^3}$$

$$\sqrt{(((13\log(50064+25353)-11)^3+(13\log(50064+25353)-11+3)^3)+((13\log(50064+25353)+21+5)^3-1))}-89-5=\frac{1}{4\pi^{3/2}}$$

$$\left(-376\pi^{3/2}+\sqrt{6}\sqrt{\left(41952\pi^3-44772\,i\,\pi^2\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds-2366\pi\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2+2197\,i\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{75416^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^3\right)}\right)\quad \text{for } -1<\gamma<0$$

Appendix

From:

Three-dimensional AdS gravity and extremal CFTs at c = 8m

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m	L_0	d	S	S_{BH}
3	1	196883	12.1904	12.5664
	2	21296876	16.8741	17.7715
	3	842609326	20.5520	21.7656
4	2/3	139503	11.8458	11.8477
	5/3	69193488	18.0524	18.7328
	8/3	6928824200	22.6589	23.6954
5	1/3	20619	9.9340	9.3664
	4/3	86645620	18.2773	18.7328
	7/3	24157197490	23.9078	24.7812

m	L_0	d	S	S_{BH}
6	1	42987519	17.5764	17.7715
	2	40448921875	24.4233	25.1327
	3	8463511703277	29.7668	30.7812
7	2/3	7402775	15.8174	15.6730
	5/3	33934039437	24.2477	24.7812
	8/3	16953652012291	30.4615	31.3460
8	1/3	278511	12.5372	11.8477
	4/3	13996384631	23.3621	23.6954
	7/3	19400406113385	30.5963	31.3460

Table 1: Degeneracies, microscopic entropies and semiclassical entropies for the first few values of m and L_0.

References

Black Hole Microstate Counting and its Macroscopic Counterpart
Ipsita Mandal and Ashoke Sen - arXiv:1008.3801v2 [hep-th] 3 Apr 2012