Further relationships between several Ramanujan formulas, equations concerning some sectors of String Theory (String Cosmology), various parameters regarding Particle Physics, ζ(2), 8 and his multiples.

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Abstract

In this paper, we describe and analyze further new relationships between some Ramanujan formulas, equations concerning some sectors of String Theory (String Cosmology), various parameters regarding Particle Physics, ζ(2), 8 and his multiples.

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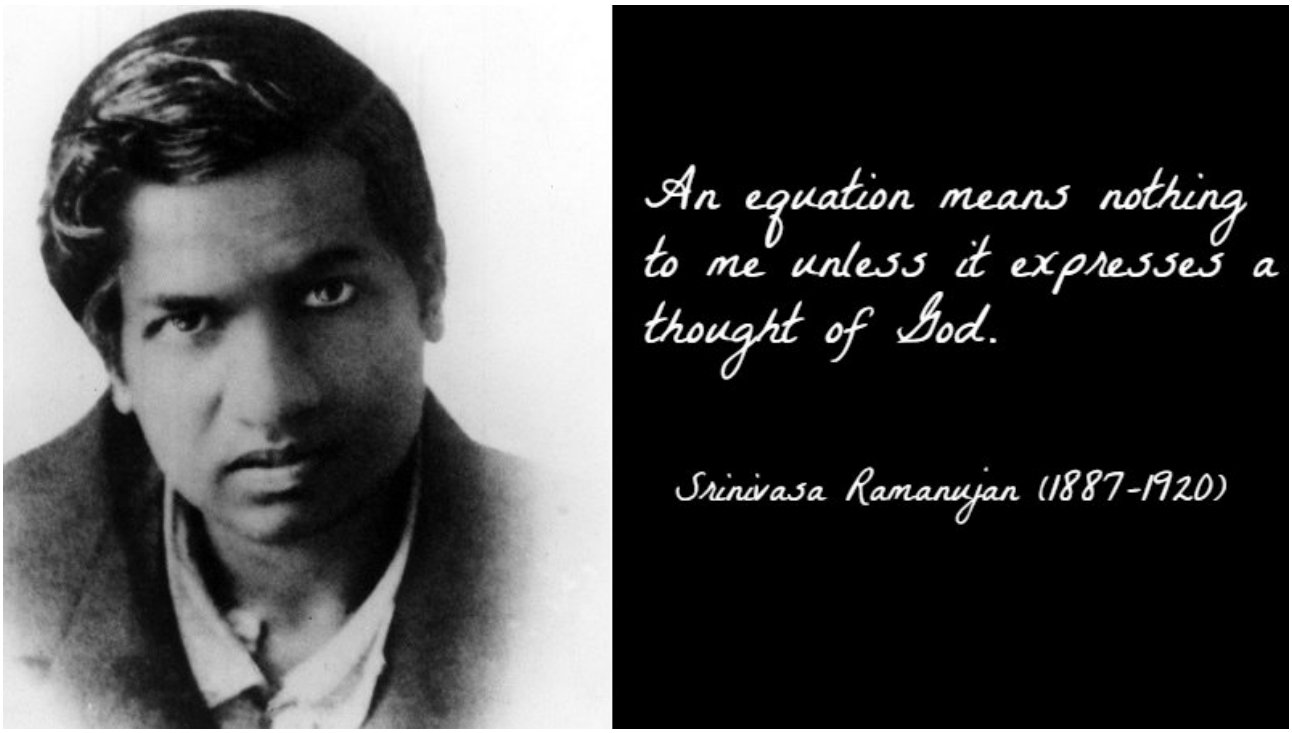


https://mobygeek.com/features/indian-mathematician-srinivasa-ramanujan-quotes-11012

From:

MODULAR EQUATIONS IN THE SPIRIT OF RAMANUJAN - *M. S. Mahadeva Naika* - Department of Mathematics, Central College Campus, Bangalore University, Bengaluru-560 001, INDIA - "IIIT - BANGALORE" - June 25, 2012

We have that, consider $(PQ_{11})^n = 2$:

$$(PQ_{11})^{10} + \frac{1024}{(PQ_{11})^{10}} + 22\left((PQ_{11})^8 + \frac{256}{(PQ_{11})^8}\right) + 209\left((PQ_{11})^6 + \frac{64}{(PQ_{11})^6}\right) + 1144\left((PQ_{11})^4 + \frac{16}{(PQ_{11})^4}\right) + 4048\left((PQ_{11})^2 + \frac{4}{(PQ_{11})^2}\right) + 9744 = \left(\frac{Q_{11}}{P}\right)^{12} + \left(\frac{P}{Q_{11}}\right)^{12}. \quad (17)$$

2^10+1024/(2^10)+22(2^8+256/(2^8))+209(2^6+64/(2^6))+1144(2^4+16/(2^4))+4048(2^2+4/(2^2))+9744

Input:

$$2^{10}+\frac{1024}{2^{10}}+22\left(2^8+\frac{256}{2^8}\right)+209\left(2^6+\frac{64}{2^6}\right)+1144\left(2^4+\frac{16}{2^4}\right)+4048\left(2^2+\frac{4}{2^2}\right)+9744$$

Result:

69 696

69696

2^10+1024/(2^10)+22(2^8+256/(2^8))+209(2^6+64/(2^6))+1144(2^4+16/(2^4))+4048(2^2+4/(2^2))+9744 = ((((1/2)^12+(2)^12)))x

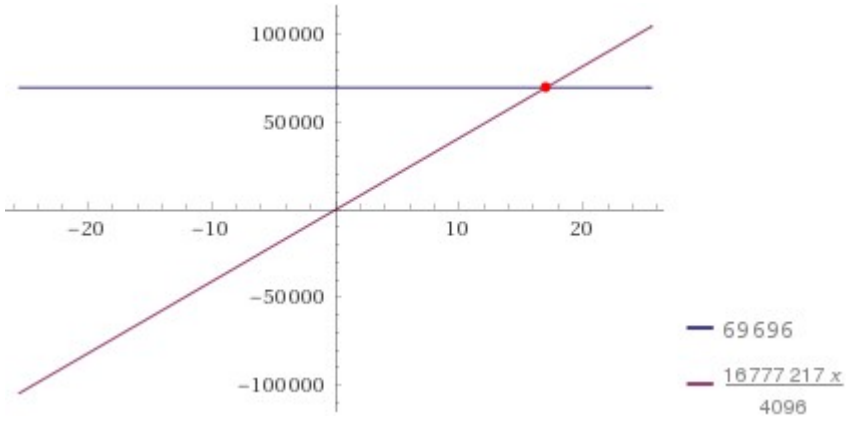
Input:

$$2^{10}+\frac{1024}{2^{10}}+22\left(2^8+\frac{256}{2^8}\right)+209\left(2^6+\frac{64}{2^6}\right)+1144\left(2^4+\frac{16}{2^4}\right)+4048\left(2^2+\frac{4}{2^2}\right)+9744=\left(\left(\frac{1}{2}\right)^{12}+2^{12}\right)x$$

Result:

$$69\,696=\frac{16\,777\,217\,x}{4096}$$

Plot:



Alternate form:

$$69\,696 - \frac{16\,777\,217\,x}{4096} = 0$$

Solution:

$$x = \frac{285\,474\,816}{16\,777\,217}$$

((((1/2)^12+(2)^12)))* 285474816/16777217

Input:

$$\left(\left(\frac{1}{2}\right)^{12} + 2^{12}\right) \times \frac{285\,474\,816}{16\,777\,217}$$

Exact result:

69 696

69696

We have also:

1/64(((2^10+1024/(2^10)+22(2^8+256/(2^8))+209(2^6+64/(2^6))+1144(2^4+16/(2^4))+4048(2^2+4/(2^2))+9744)))

Input:

$$\frac{1}{64}\left(2^{10} + \frac{1024}{2^{10}} + 22\left(2^8 + \frac{256}{2^8}\right) + 209\left(2^6 + \frac{64}{2^6}\right) + 1144\left(2^4 + \frac{16}{2^4}\right) + 4048\left(2^2 + \frac{4}{2^2}\right) + 9744\right)$$

Exact result:

1089

1089

From which:

1/64(((2^10+1024/(2^10)+22(2^8+256/(2^8))+209(2^6+64/(2^6))+1144(2^4+16/(2^4))+4048(2^2+4/(2^2))+9744)))-47-18

Input:

$$\frac{1}{64}\left(2^{10}+\frac{1024}{2^{10}}+22\left(2^8+\frac{256}{2^8}\right)+209\left(2^6+\frac{64}{2^6}\right)+1144\left(2^4+\frac{16}{2^4}\right)+4048\left(2^2+\frac{4}{2^2}\right)+9744\right)-47-18$$

Exact result:

1024
1024

and:

8((((1/64(((2^10+1024/(2^10)+22(2^8+256/(2^8))+209(2^6+64/(2^6))+1144(2^4+16/(2^4))+4048(2^2+4/(2^2))+9744)))-47-18))))

Input:

$$8\left(\frac{1}{64}\left(2^{10}+\frac{1024}{2^{10}}+22\left(2^8+\frac{256}{2^8}\right)+209\left(2^6+\frac{64}{2^6}\right)+1144\left(2^4+\frac{16}{2^4}\right)+4048\left(2^2+\frac{4}{2^2}\right)+9744\right)-47-18\right)$$

Exact result:

8192
$8192 = 2 * 64^2$

Now, we have that:

$$(PQ_3)^6+\frac{64}{(PQ_3)^6}+32=\left(P^{12}+\frac{64}{P^{12}}\right)^{1/2}\left(Q_3^{12}+\frac{64}{Q_3^{12}}\right)^{1/2}$$

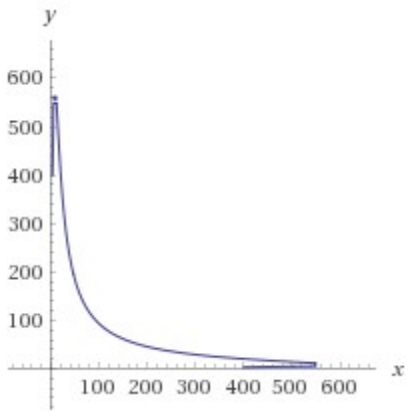
For $(PQ_3)^6 = 1$, we obtain:

97 = (x+64/x)^0.5 (y+64/y)^0.5

Input:

$$97 = \sqrt{x + \frac{64}{x}}\ \sqrt{y + \frac{64}{y}}$$

Implicit plot:



Alternate form:

$$97 = \sqrt{\frac{x^2 + 64}{x}}\ \sqrt{\frac{y^2 + 64}{y}}$$

Real solutions:

$x \approx 0.108852, \quad y = 8$

$0.108852 < x < 587.954,$

$$y \approx \frac{1}{x^2 + 64} 0.5 \left(- \sqrt{\frac{-256\,x^4 + 88\,496\,513\,x^2 - 1\,048\,576}{(x^2 + 64)^2}}\ x^2 - 64 \sqrt{\frac{-256\,x^4 + 88\,496\,513\,x^2 - 1\,048\,576}{(x^2 + 64)^2}} + 9409\,x \right)$$

$0.108852 < x < 587.954, \quad y \approx$

$$\frac{0.5 \left(\sqrt{\frac{-256\,x^4 + 88\,496\,513\,x^2 - 1\,048\,576}{(x^2 + 64)^2}}\ x^2 + 64 \sqrt{\frac{-256\,x^4 + 88\,496\,513\,x^2 - 1\,048\,576}{(x^2 + 64)^2}} + 9409\,x \right)}{x^2 + 64}$$

$x \approx 587.954, \quad y \approx 8$

Solutions for the variable y:

$$y = \frac{1}{2}\left(\frac{9409\,x}{x^2+64} - \sqrt{\frac{88\,529\,281\,x^2}{(x^2+64)^2} - 256}\right)$$

$$y = \frac{1}{2}\left(\frac{9409\,x}{x^2+64} + \sqrt{\frac{88\,529\,281\,x^2}{(x^2+64)^2} - 256}\right)$$

Implicit derivatives:

$$\frac{\partial x(y)}{\partial y} = \frac{9409\,x - 128\,y - 2\,x^2\,y}{-9409\,y + 2\,x\,(64+y^2)}$$

$$\frac{\partial y(x)}{\partial x} = \frac{9409\,y - 2\,x\,(64+y^2)}{-9409\,x + 128\,y + 2\,x^2\,y}$$

(0.108852+64/0.108852)^0.5 (8+64/8)^0.5

Input interpretation:

$$\sqrt{0.108852 + \frac{64}{0.108852}}\ \sqrt{8 + \frac{64}{8}}$$

Result:

97.0001...

97.0001…

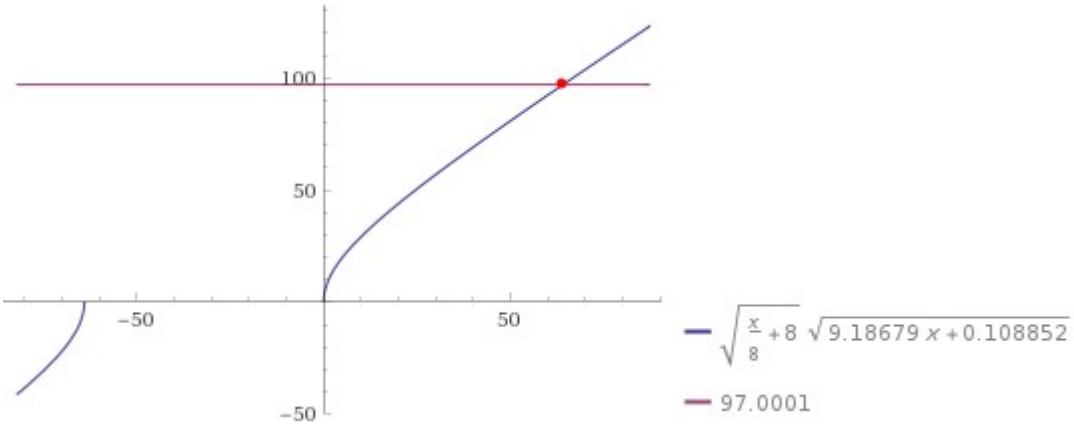
We have also:

(0.108852+x/0.108852)^0.5 (8+x/8)^0.5 = 97.00005266

Input interpretation:

$$\sqrt{0.108852 + \frac{x}{0.108852}}\ \sqrt{8 + \frac{x}{8}} = 97.00005266$$

Plot:



Alternate form assuming x is real:

$$\sqrt{x+64}\ \sqrt{9.18679\,x+0.108852}\ = 274.358$$

Alternate forms:

$$\sqrt{x+64}\ \sqrt{9.18679\,x+0.108852}\ = 274.358$$

$$\frac{\sqrt{x+64}\ \sqrt{9.18679\,x+0.108852}}{2\sqrt{2}} = 97.0001$$

Alternate form assuming x is positive:

$$\sqrt{x\,(1.14835\,x+73.5079)+0.870816}\ = 97.0001$$

Alternate forms assuming x>0:

$$\sqrt{1.14835\,x^2+73.5079\,x+0.870816}\ = 97.0001$$

$$\sqrt{\left(\frac{x}{8}+8\right)(9.18679\,x+0.108852)}\ = 97.0001$$

Solution:

$x \approx 64.$

64

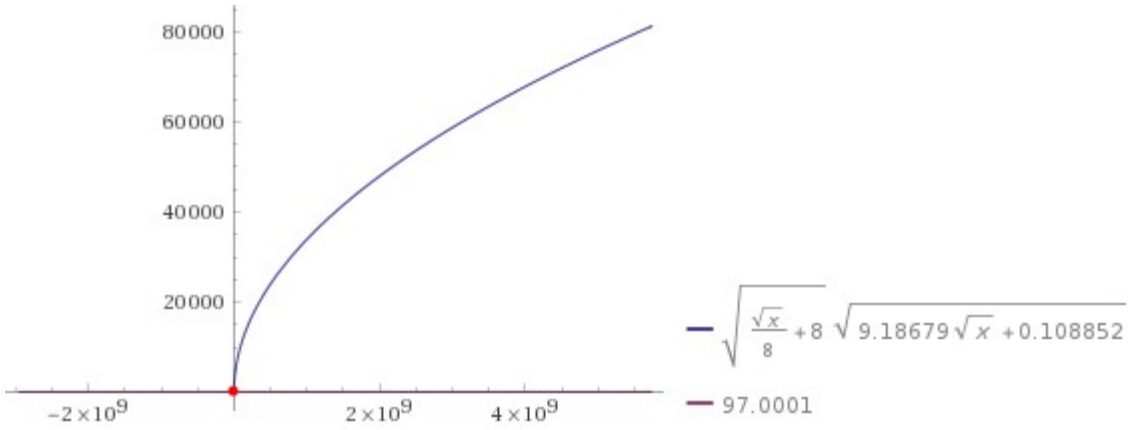
and:

(0.108852+(x)^(0.5)/0.108852)^0.5 (8+(x)^(0.5)/8)^0.5 = 97.00005266

Input interpretation:

$$\sqrt{0.108852 + \frac{\sqrt{x}}{0.108852}}\ \sqrt{8 + \frac{\sqrt{x}}{8}} = 97.00005266$$

Plot:



Alternate forms:

$$\sqrt{\sqrt{x}+64}\ \sqrt{9.18679\sqrt{x}+0.108852} = 274.358$$

$$\frac{\sqrt{\sqrt{x}+64}\ \sqrt{9.18679\sqrt{x}+0.108852}}{2\sqrt{2}} = 97.0001$$

Alternate form assuming x is positive:

$$\sqrt{x + 64.0118\sqrt{x} + 0.758321} = 90.518$$

Alternate form assuming x>0:

$$\sqrt{1.14835\,x + 73.5079\sqrt{x} + 0.870816} = 97.0001$$

Solution:

$x \approx 4096.$

$4096 = 64^2$

We have also that:

$$Y^6+\frac{1}{Y^6}-908\left[Y^5+\frac{1}{Y^5}\right]-83582\left[Y^4+\frac{1}{Y^4}\right]-1369692\left[Y^3+\frac{1}{Y^3}\right]$$
$$-3\left[Y^2+\frac{1}{Y^2}\right]\left\{2657883-96832\left[X^2+\frac{16}{X^2}\right]\right\}-24\left[Y+\frac{1}{Y}\right]$$
$$\times\left\{892353+289628\left[X+\frac{4}{X}\right]\right\}+17323008\left[\sqrt{Y}+\frac{1}{\sqrt{Y}}\right]\left[\sqrt{X}+\frac{2}{\sqrt{X}}\right]$$
$$+1831776\left[\sqrt{Y^3}+\frac{1}{\sqrt{Y^3}}\right]\left[\sqrt{X^3}+\frac{8}{\sqrt{X^3}}\right]+21504\left[\sqrt{Y^5}+\frac{1}{\sqrt{Y^5}}\right]$$
$$\times\left[\sqrt{X^5}+\frac{32}{\sqrt{X^5}}\right]-29469924=128\left\{2\left[X^4+\frac{256}{X^4}\right]\right.$$
$$\left.+420\left[X^3+\frac{64}{X^3}\right]+9987\left[X^2+\frac{16}{X^2}\right]+75426\left[X+\frac{4}{X}\right]\right\}. \quad (63)$$

From

$$128\left\{2\left[X^4+\frac{256}{X^4}\right]\right.$$
$$\left.+420\left[X^3+\frac{64}{X^3}\right]+9987\left[X^2+\frac{16}{X^2}\right]+75426\left[X+\frac{4}{X}\right]\right\}$$

For $X^n = 1$, we obtain:

128[2(1+256)+420(1+64)+9987(1+16)+75426(1+4)]

Input:

128 (2 (1 + 256) + 420 (1 + 64) + 9987 (1 + 16) + 75 426 (1 + 4))

Result:

73564544

73564544

Scientific notation:

7.3564544×10^7

We have, dividing by 128:

[2(1+256)+420(1+64)+9987(1+16)+75426(1+4)]

Input:

$2\,(1 + 256) + 420\,(1 + 64) + 9987\,(1 + 16) + 75\,426\,(1 + 4)$

Result:

574 723

574723

From which:

10^3+sqrt(([2(1+256)+420(1+64)+9987(1+16)+75426(1+4)])))-29

Input:

$10^3 + \sqrt{2\,(1 + 256) + 420\,(1 + 64) + 9987\,(1 + 16) + 75\,426\,(1 + 4)} - 29$

Result:

$971 + \sqrt{574\,723}$

Decimal approximation:

1729.104874011505086300149306907916091786186337148605153686...

1729.104874…

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

Minimal polynomial:

$x^2 - 1942\,x + 368\,118$

1/138[2(1+256)+420(1+64)+9987(1+16)+75426(1+4)]-144+55+21-1/golden ratio

where 138 is the cubic root of the Ramanujan cube number 138^3

Input:

$$\frac{1}{138}\left(2\left(1+256\right)+420\left(1+64\right)+9987\left(1+16\right)+75\,426\left(1+4\right)\right)-144+55+21-\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

$$\frac{565\,339}{138}-\frac{1}{\phi}$$

Decimal approximation:

4096.041386301105177615563529107663347389526067631788440036...

4096.0413863… ≈ 4096 = 64^2

Alternate forms:

$$\frac{1}{138}\left(565\,408-69\sqrt{5}\right)$$

$$-\frac{138-565\,339\,\phi}{138\,\phi}$$

$$\frac{565\,339\,\phi-138}{138\,\phi}$$

Alternative representations:

$$\frac{1}{138}\left(2\left(1+256\right)+420\left(1+64\right)+9987\left(1+16\right)+75\,426\left(1+4\right)\right)-144+55+21-\frac{1}{\phi}=$$
$$-68+\frac{574\,723}{138}-\frac{1}{2\sin(54^\circ)}$$

$$\frac{1}{138}(2(1+256)+420(1+64)+9987(1+16)+75426(1+4))-144+55+21-\frac{1}{\phi}=$$
$$-68+\frac{574723}{138}--\frac{1}{2\cos(216^\circ)}$$

$$\frac{1}{138}(2(1+256)+420(1+64)+9987(1+16)+75426(1+4))-144+55+21-\frac{1}{\phi}=$$
$$-68+\frac{574723}{138}--\frac{1}{2\sin(666^\circ)}$$

Performing the following integral, we obtain:

integrate [1/2(((1/138[2(1+256)+420(1+64)+9987(1+16)+75426(1+4)]-144+55+21-1/golden ratio)))]x, 0..1

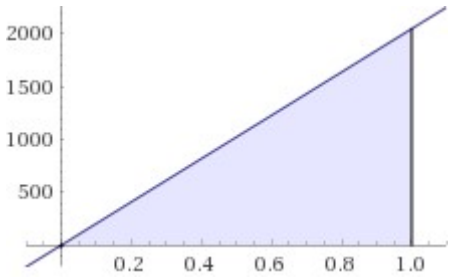
Definite integral:

$$\int_0^1 \frac{1}{2}\left(\frac{1}{138}(2(1+256)+420(1+64)+9987(1+16)+75426(1+4))-144+55+21-\frac{1}{\phi}\right)x\,dx=\frac{565339}{552}-\frac{1}{4\phi}\approx 1024.01$$

1024

ϕ is the golden ratio

Visual representation of the integral:



Now, we have that:

$$Q^6+\frac{1}{Q^6}-136\left(Q^5+\frac{1}{Q^5}\right)+2458\left(Q^4+\frac{1}{Q^4}\right)-12264\left(Q^3+\frac{1}{Q^3}\right)$$
$$+40911\left(Q^2+\frac{1}{Q^2}\right)-73104\left(Q+\frac{1}{Q}\right)+256\left(P^4+\frac{16}{P^4}\right)+3840\left(P^3+\frac{8}{P^3}\right)$$
$$+17280\left(P^2+\frac{4}{P^2}\right)+51072\left(P+\frac{2}{P}\right)+95532=256\left(P^4+\frac{16}{P^4}\right)\left(Q+\frac{1}{Q}\right)$$
$$+1152\left(P^3+\frac{8}{P^3}\right)\left[2\left(Q^2+\frac{1}{Q^2}\right)-\left(Q+\frac{1}{Q}\right)\right]+576\left(P^2+\frac{4}{P^2}\right)$$
$$\times\left[25\left(Q+\frac{1}{Q}\right)-11\left(Q^2+\frac{1}{Q^2}\right)+3\left(Q^3+\frac{1}{Q^3}\right)\right]+192\left(P+\frac{2}{P}\right)$$
$$\times\left[221\left(Q+\frac{1}{Q}\right)-110\left(Q^2+\frac{1}{Q^2}\right)+35\left(Q^3+\frac{1}{Q^3}\right)-5\left(Q^4+\frac{1}{Q^4}\right)\right].$$
(45)

From the left-hand side, for $Q^n = P^n = 1$, we obtain:

$$Q^6+\frac{1}{Q^6}-136\left(Q^5+\frac{1}{Q^5}\right)+2458\left(Q^4+\frac{1}{Q^4}\right)-12264\left(Q^3+\frac{1}{Q^3}\right)$$
$$+40911\left(Q^2+\frac{1}{Q^2}\right)-73104\left(Q+\frac{1}{Q}\right)+256\left(P^4+\frac{16}{P^4}\right)+3840\left(P^3+\frac{8}{P^3}\right)$$
$$+17280\left(P^2+\frac{4}{P^2}\right)+51072\left(P+\frac{2}{P}\right)+95532$$

(1+1-136*2+2458*2-12264*2+40911*2-
73104*2+256*17+3840*9+17280*5+51072*3+95532)

Input:

$$1+1-136\times2+2458\times2-12\,264\times2+40\,911\times2-$$
$$73\,104\times2+256\times17+3840\times9+17\,280\times5+51\,072\times3+95\,532$$

Result:

289 792

289792

From the right-hand side, we obtain:

$$256\left(P^4+\frac{16}{P^4}\right)\left(Q+\frac{1}{Q}\right)$$

$$+1152\left(P^3+\frac{8}{P^3}\right)\left[2\left(Q^2+\frac{1}{Q^2}\right)-\left(Q+\frac{1}{Q}\right)\right]+576\left(P^2+\frac{4}{P^2}\right)$$
$$\times\left[25\left(Q+\frac{1}{Q}\right)-11\left(Q^2+\frac{1}{Q^2}\right)+3\left(Q^3+\frac{1}{Q^3}\right)\right]+192\left(P+\frac{2}{P}\right)$$
$$\times\left[221\left(Q+\frac{1}{Q}\right)-110\left(Q^2+\frac{1}{Q^2}\right)+35\left(Q^3+\frac{1}{Q^3}\right)-5\left(Q^4+\frac{1}{Q^4}\right)\right]$$

256*17*2+1152*9 [2*2-2]+576(1+4)*[25*2-11*2+3*2]+192*3*[221*2-110*2+35*2-5*2]

Input:

$$256\times17\times2+1152\times9\,(2\times2-2)+576\,(1+4)\,(25\times2-11\times2+3\times2)+192\times3\,(221\times2-110\times2+35\times2-5\times2)$$

Result:

289 792

289792

1/256(((256*17*2+1152*9 [2*2-2]+576(1+4)*[25*2-11*2+3*2]+192*3*[221*2-110*2+35*2-5*2])))

Input:

$$\frac{1}{256}\,(256\times17\times2+1152\times9\,(2\times2-2)+576\,(1+4)\,(25\times2-11\times2+3\times2)+192\times3\,(221\times2-110\times2+35\times2-5\times2))$$

Exact result:

1132

1132

From which:

1/256(((256*17*2+1152*9 [2*2-2]+576(1+4)*[25*2-11*2+3*2]+192*3*[221*2-110*2+35*2-5*2])))-27*4

Input:

$$\frac{1}{256}\left(256\times 17\times 2+1152\times 9\,(2\times 2-2)+576\,(1+4)\,(25\times 2-11\times 2+3\times 2)+192\times 3\,(221\times 2-110\times 2+35\times 2-5\times 2)\right)-27\times 4$$

Exact result:

1024
1024

From:

On Climbing Scalars in String Theory
E. Dudas, N. Kitazawa and A. Sagnotti - arXiv:1009.0874v1 [hep-th] 4 Sep 2010

We have that:

Let us consider a four–dimensional effective action described via a superpotential W and a Kähler potential K of the type

$$W \;=\; W_0 \;+\; a\, e^{-bT}\;, \qquad K \;=\; -\,3\;\ln(T+\bar{T})\;, \tag{3.1}$$

where we work again with $\kappa_4 = 1$. In the standard setting of [25] these determine the potential

$$V_F \;=\; \frac{b}{(T+\bar{T})^2}\;\left\{ a\,\bar{W}_0 e^{-bT} \;+\; \bar{a}\,W_0 e^{-b\bar{T}} \;+\; \frac{|a|^2}{3}\;[6+b(T+\bar{T})]\;e^{-b(T+\bar{T})} \right\}\;, \tag{3.2}$$

and this class of models has tiny wells whose local minima correspond to negative values for the vacuum energy. In order to overcome this problem, the complete KKLT potentials of [18] contain an additional contribution of the type

$$V \;=\; V_F \;+\; \frac{c}{(T+\bar{T})^3}\;, \tag{3.3}$$

whose net effect is precisely to lift the minima to *positive* vacuum energies. This contribution is usually ascribed to an F–term uplift [24], but as we have seen our arguments of Section 2.2 can relate it to a ten–dimensional tadpole. The complete potential has a valley of local minima and maintains a typical runaway behavior in the asymptotic region $Re\;T \to \infty$, where it is dominated by the uplift $(3.3)^2$.

In adapting eqs. (3.2) and (3.3) to the four–dimensional KKLT system [18], the complex field T is to be expanded according to

$$T \;=\; e^{\frac{\Phi_t}{\sqrt{3}}} \;+\; i\;\frac{\theta}{\sqrt{3}}\;, \tag{3.4}$$

in terms of the canonically normalized scalar Φ_t and the axion θ. As we have anticipated, the last term in eq. (3.3) corresponds precisely to the "critical" value $\gamma = 1$, in the notation of Section 2, so that the relevant portion of the low–energy effective field theory reads

$$S = \frac{1}{2}\int d^4x\sqrt{-g}\left[R - \frac{1}{2}\;(\partial\Phi_t)^2 - \frac{1}{2}\;e^{-\frac{2}{\sqrt{3}}\Phi_t}\;(\partial\theta)^2 - V(\Phi_T,\theta)\right]\;. \tag{3.5}$$

In the convenient gauge (2.3) and with the redefinitions

$$\Phi_t = \frac{2}{\sqrt{3}}\, x\ , \quad \theta = \frac{2}{\sqrt{3}}\, y\ , \quad \tau = M\sqrt{\frac{3}{2}}\, t\ , \tag{3.6}$$

where M is a dimensionful quantity related to the energy scale of the potential V, and neglecting the contribution of the D9 brane (the D3 brane, in the notation of the previous section), the field equations become

$$\begin{aligned}
&\frac{d^2x}{d\tau^2} + \frac{dx}{d\tau}\sqrt{1+\left(\frac{dx}{d\tau}\right)^2 + e^{-\frac{4x}{3}}\left(\frac{dy}{d\tau}\right)^2} + \frac{1}{2V}\frac{\partial V}{\partial x}\left[1+\left(\frac{dx}{d\tau}\right)^2\right] \\
&\qquad + \frac{1}{2V}\frac{\partial V}{\partial y}\frac{dx}{d\tau}\frac{dy}{d\tau} + \frac{2}{3}\, e^{-\frac{4x}{3}}\left(\frac{dy}{d\tau}\right)^2 = 0\ , \\
&\frac{d^2y}{d\tau^2} + \frac{dy}{d\tau}\sqrt{1+\left(\frac{dx}{d\tau}\right)^2 + e^{-\frac{4x}{3}}\left(\frac{dy}{d\tau}\right)^2} + \left(\frac{1}{2V}\frac{\partial V}{\partial x} - \frac{4}{3}\right)\frac{dx}{d\tau}\frac{dy}{d\tau} \\
&\qquad + \frac{1}{2V}\frac{\partial V}{\partial y}\left[e^{\frac{4x}{3}} + \left(\frac{dy}{d\tau}\right)^2\right] = 0\ ,
\end{aligned} \tag{3.7}$$

while the scalar potential takes the form

$$\begin{aligned}
V &= \frac{c}{8}\, e^{-2x} + \frac{b}{2}\, e^{-\frac{4x}{3} - b\, e^{\frac{2x}{3}}}\left[(Re\ a\overline{W_0})\cos\frac{2by}{3} + (Im\ a\overline{W_0})\sin\frac{2by}{3}\right. \\
&\quad \left. + \frac{|a|^2}{3}\left(3 + b\, e^{\frac{2x}{3}}\right) e^{-b\, e^{\frac{2x}{3}}}\right]\ .
\end{aligned} \tag{3.8}$$

From eq.(3.8)

$$\begin{aligned}
V &= \frac{c}{8}\, e^{\ 2x} + \frac{b}{2}\, e^{\ \frac{4x}{3}\ \ b\, e^{\frac{2x}{3}}}\left[(Re\ a\overline{W_0})\cos\frac{2by}{3} + (Im\ a\overline{W_0})\sin\frac{2by}{3}\right. \\
&\quad \left. + \frac{|a|^2}{3}\left(3 + b\, e^{\frac{2x}{3}}\right) e^{\ b\, e^{\frac{2x}{3}}}\right]\ .
\end{aligned}$$

For:

$$\gamma \geq \frac{\sqrt{10}-1}{3} \approx 0.72\ ,$$

$$c = \frac{\gamma}{\sqrt{1-\gamma^2}}$$

0.7207592 / sqrt(1-0.7207592^2)

$$\frac{0.7207592}{\sqrt{1-0.7207592^2}}$$

c = 1.039778

$$a = (D-1)\,A$$

$$\gamma > 1 \text{ for } D < 4 \text{ and } \gamma < 1 \text{ for } D > 5$$

a = 4A for A = 1 a = 4

We put:

by = 2π ; b = 2

$$e^{-2x} = e^{-\pi\sqrt{22}}$$

$$e^{-\frac{4x}{3}-b\,e^{\frac{2x}{3}}} = 4372e^{-\pi\sqrt{37}} \qquad e^{-b\,e^{\frac{2x}{3}}} = 4372e^{-\pi\sqrt{22}}$$

$$W = W_0 + a\,e^{-bT} \qquad W_0 = 1\text{-}4 * e^{-\pi\sqrt{37}} \quad \text{or} \quad W_0 = 1\text{-}4i * e^{-\pi\sqrt{37}}$$

$$e^{\frac{2x}{3}} = e^{\frac{1}{8}\pi\sqrt{18}}$$

We note that, for these calculations, we have utilized several values concerning a Chapter of the fundamental Ramanujan paper "Modular equations and approximations to π". Also the results 64 and 4096 are numbers inherent the same work. (see Observations)

Thence, from:

$$V = \frac{c}{8}\,e^{-2x} + \frac{b}{2}\,e^{-\frac{4x}{3}-b\,e^{\frac{2x}{3}}}\left[(Re\;a\overline{W_0})\cos\frac{2by}{3} + (Im\;a\overline{W_0})\sin\frac{2by}{3} + \frac{|a|^2}{3}\left(3+b\,e^{\frac{2x}{3}}\right)e^{-b\,e^{\frac{2x}{3}}}\right].$$

We obtain:

1.039778 / 8 * exp(-Pi*sqrt22)+4372*exp(-Pi*sqrt37) *[(1-4*exp(-Pi*sqrt37)) cos ((4Pi)/3) + (1-4i*exp(-Pi*sqrt37)) sin ((4Pi)/3) + 16/3 (3+2*exp(Pi/8*sqrt18)) * 4372*exp(-Pi*sqrt22)]

Input interpretation:

$$\frac{1.039778}{8}\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-4\,i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{16}{3}\left(3+2\exp\left(\frac{\pi}{8}\sqrt{18}\right)\right)\times 4372\exp\left(-\pi\sqrt{22}\right)\right)$$

i is the imaginary unit

Result:

$$-0.00002716590273\ldots+3.818704487\ldots\times 10^{-13}\,i$$

Polar coordinates:

$r = 0.0000271659$ (radius), $\theta = 180.°$ (angle)

0.0000271659

Alternative representations:

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)=4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(\frac{4\,i\,\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\cos\left(-\frac{5\pi}{6}\right)\left(1-4\,i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)=4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\frac{69952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(-\frac{4i\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\right.$$
$$\left.\cos\left(-\frac{5\pi}{6}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)=4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\frac{69952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(-\frac{4i\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)-\right.$$
$$\left.\cos\left(\frac{11\pi}{6}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)$$

Series representations:

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=$$
$$2.03887\times10^{8}\left(6.37473\times10^{-10}\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\right.\right.$$
$$\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$1.5\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$\exp\left(\frac{1}{8}\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$0.0000428866\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)-0.000171546\,i$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)+0.0000214433$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}-0.0000857731$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left.\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}\right)\ \text{for}\ (x\in\mathbb{R}\ \text{and}\ x<0)$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=$$
$$2.03887\times10^{8}\left(6.37473\times10^{-10}\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\right.\right.$$
$$\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$1.5\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$\exp\left(\frac{1}{8}\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$0.0000214433\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}-0.0000857731$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}+0.0000214433$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}\right)^{-1-2k}e^{i\,k\,\pi}\pi^{1+2k}}{(1+2k)!}-0.0000857731\,i$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left.\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}\right)^{-1-2k}e^{i\,k\,\pi}\pi^{1+2k}}{(1+2k)!}\right)\text{ for }(x\in\mathbb{R}\text{ and }x<0)$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=$$
$$2.03887\times10^{8}\left(6.37473\times10^{-10}\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+0.0000214433\,J_0\left(\frac{4\pi}{3}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$1.5\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$\exp\left(\frac{1}{8}\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)-$$
$$0.0000857731\,J_0\left(\frac{4\pi}{3}\right)\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+0.0000428866$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=1}^{\infty}(-1)^k J_{2k}\left(\frac{4\pi}{3}\right)-0.000171546$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=1}^{\infty}(-1)^k J_{2k}\left(\frac{4\pi}{3}\right)+0.0000428866$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)-0.000171546\,i$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left.\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)\right)\ \text{for}\ (x\in\mathbb{R}\ \text{and}\ x<0)$$

Integral representations:

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=\exp\left(-\pi\sqrt{22}\right)\left(0.129972+\left(3.0583\times10^{8}+2.03887\times10^{8}\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{37}\right)\right)+\frac{\exp\left(-\pi\sqrt{37}\right)\sqrt{\pi}}{\pi\mathcal{A}}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(4\pi^2)/(9s)+s}\left(1457.33\pi+2186\,s+(-5829.33\,i\pi-8744\,s)\exp\left(-\pi\sqrt{37}\right)\right)}{s^{3/2}}\,ds\quad\text{for }\gamma>0$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=0.129972\exp\left(-\pi\sqrt{22}\right)+3.0583\times10^{8}\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)+2.03887\times10^{8}\exp\left(\frac{\pi\sqrt{18}}{8}\right)\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)+\int_{\frac{\pi}{2}}^{\frac{4\pi}{3}}-\frac{4372}{5}\exp\left(-\pi\sqrt{37}\right)\left(8\cos\left(-\frac{4}{5}(\pi-2t)\right)\left(-1+4\,i\exp\left(-\pi\sqrt{37}\right)\right)+5\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\sin(t)\right)dt$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)+305\,830\,144\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)+\frac{611\,660\,288}{3}\exp\left(\frac{\pi\sqrt{18}}{8}\right)\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)-17\,488\exp^{2}\left(-\pi\sqrt{37}\right)+\int_{0}^{1}-\frac{17\,488}{3}\pi\exp\left(-\pi\sqrt{37}\right)\left(\cos\left(\frac{4\pi t}{3}\right)\left(-1+4\,i\exp\left(-\pi\sqrt{37}\right)\right)+\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{4\pi t}{3}\right)\right)dt$$

Multiple-argument formulas:

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)=0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\left(-1+2\cos^2\left(\frac{2\pi}{3}\right)\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+2\cos\left(\frac{2\pi}{3}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{2\pi}{3}\right)\right)$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)=0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+2\cos\left(\frac{2\pi}{3}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{2\pi}{3}\right)+\left(-1+4\exp\left(-\pi\sqrt{37}\right)\right)\left(-1+2\sin^2\left(\frac{2\pi}{3}\right)\right)\right)$$

$$\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)=0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\left(-1+2\cos^2\left(\frac{2\pi}{3}\right)\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\left(-1+4i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{4\pi}{9}\right)\left(-3+4\sin^2\left(\frac{4\pi}{9}\right)\right)\right)$$

From which:

1/((((1.039778 / 8 * exp(-Pi*sqrt22)+4372*exp(-Pi*sqrt37) *[(1-4*exp(-Pi*sqrt37)) cos ((4Pi)/3) + (1-4i*exp(-Pi*sqrt37)) sin ((4Pi)/3) + 16/3 (3+2*exp(Pi/8*sqrt18)) * 4372*exp(-Pi*sqrt22)])))

Input interpretation:

$$1 \Big/ \left(\frac{1.039778}{8} \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{16}{3}\left(3 + 2 \exp\left(\frac{\pi}{8}\sqrt{18}\right)\right) \times 4372 \exp\left(-\pi \sqrt{22}\right)\right)\right)$$

i is the imaginary unit

Result:

$$-36810.8511\ldots - 0.000517449259\ldots\, i$$

Polar coordinates:

$r = 36\,810.9$ (radius), $\theta = -180.°$ (angle)

36810.9

Alternative representations:

$$1 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) =$$

$$1 \Big/ \left(4372 \exp\left(-\pi \sqrt{37}\right)\left(\frac{69\,952}{3}\left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \cosh\left(\frac{4\, i\, \pi}{3}\right)\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) + \cos\left(-\frac{5\pi}{6}\right)\left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right)\right) + \frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right)\right)$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=1\Big/\left(4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(-\frac{4i\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\cos\left(-\frac{5\pi}{6}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)\right)$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=1\Big/\left(4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(-\frac{4i\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)-\cos\left(\frac{11\pi}{6}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)\right)$$

Series representations:

$$1 \Big/ \left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978 + 4372\exp\left(-\pi\sqrt{37}\right)\right.$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right) =$$
$$4.90468\times 10^{-9} \Big/ \left(6.37473\times 10^{-10}\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\right.\right.$$
$$\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$1.5\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$\exp\left(\frac{1}{8}\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$0.0000428866\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)-0.000171546\,i$$
$$\exp^2\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)+0.0000214433$$
$$\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}-0.0000857731$$
$$\exp^2\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left.\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\right.$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=$$
$$4.90468\times10^{-9}\Big/\left(6.37473\times10^{-10}\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\right.\right.$$
$$\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$1.5\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$\exp\left(\frac{1}{8}\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+$$
$$0.0000214433\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}-0.0000857731$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}+0.0000214433$$
$$\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}\right)^{-1-2k}e^{ik\pi}\pi^{1+2k}}{(1+2k)!}-0.0000857731\,i$$
$$\exp^2\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left.\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}\right)^{-1-2k}e^{ik\pi}\pi^{1+2k}}{(1+2k)!}\right)\quad\text{for}\ (x\in\mathbb{R}\ \text{and}\ x<0)$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)\right)16\times4372\exp\left(-\pi\sqrt{22}\right)\right)=$$

$$4.90468\times10^{-9}\Big/\left(6.37473\times10^{-10}\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+0.0000214433\,J_0\left(\frac{4\pi}{3}\right)\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+1.5\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+\exp\left(\frac{1}{8}\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)-0.0000857731\,J_0\left(\frac{4\pi}{3}\right)\exp^2\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)+0.0000428866\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=1}^{\infty}(-1)^k J_{2k}\left(\frac{4\pi}{3}\right)-0.000171546\exp^2\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=1}^{\infty}(-1)^k J_{2k}\left(\frac{4\pi}{3}\right)+0.0000428866\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)-0.000171546\,i\exp^2\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)\right)\text{ for }(x\in\mathbb{R}\text{ and }x<0)$$

Integral representations:

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=(4.90468\times 10^{-9}\,\pi\,\mathcal{A})\Big/\left(\pi\,\mathcal{A}\exp\left(-\pi\sqrt{22}\right)\left(6.37473\times 10^{-10}+\left(1.5+\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{37}\right)\right)+\exp\left(-\pi\sqrt{37}\right)\sqrt{\pi}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{1}{s^{3/2}}e^{-(4\pi^2)/(9s)+s}\left(7.14776\times 10^{-6}\,\pi+0.0000107216\,s+(-0.000028591\,i\,\pi-0.0000428866\,s)\exp\left(-\pi\sqrt{37}\right)\right)ds\right)\quad\text{for}\quad\gamma>0$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=(4.90468\times 10^{-9}\,\mathcal{A})\Big/\left(6.37473\times 10^{-10}\,\mathcal{A}\exp\left(-\pi\sqrt{22}\right)+1.5\,\mathcal{A}\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)+\mathcal{A}\exp\left(\frac{\pi\sqrt{18}}{8}\right)\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)-0.0000214433\,\mathcal{A}\exp\left(-\pi\sqrt{37}\right)\int_{\frac{\pi}{2}}^{\frac{4\pi}{3}}\sin(t)\,dt+0.0000857731\,\mathcal{A}\exp^2\left(-\pi\sqrt{37}\right)\int_{\frac{\pi}{2}}^{\frac{4\pi}{3}}\sin(t)\,dt+7.14776\times 10^{-6}\exp\left(-\pi\sqrt{37}\right)\sqrt{\pi}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(4\pi^2)/(9s)+s}}{s^{3/2}}ds-0.000028591\,i\exp^2\left(-\pi\sqrt{37}\right)\sqrt{\pi}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(4\pi^2)/(9s)+s}}{s^{3/2}}ds\right)\quad\text{for}\quad\gamma>0$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\right.$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=$$
$$-\left((0.0000428866\,\pi\,\mathcal{A})\Big/\left(-5.57406\times 10^{-6}\,\pi\,\mathcal{A}\exp\left(-\pi\sqrt{22}\right)-\right.\right.$$
$$13\,116\,\pi\,\mathcal{A}\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)-$$
$$8744\,\pi\,\mathcal{A}\exp\left(\frac{\pi\sqrt{18}}{8}\right)\exp\left(-\pi\sqrt{22}\right)\exp\left(-\pi\sqrt{37}\right)-$$
$$0.25\,\pi^2\,\mathcal{A}\exp\left(-\pi\sqrt{37}\right)\int_0^1\cos\left(\frac{4\pi t}{3}\right)dt+$$
$$i\,\pi^2\,\mathcal{A}\exp^2\left(-\pi\sqrt{37}\right)\int_0^1\cos\left(\frac{4\pi t}{3}\right)dt-$$
$$0.09375\exp\left(-\pi\sqrt{37}\right)\sqrt{\pi}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(4\pi^2)/(9s)+s}}{\sqrt{s}}ds+$$
$$\left.\left.0.375\exp^2\left(-\pi\sqrt{37}\right)\sqrt{\pi}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{-(4\pi^2)/(9s)+s}}{\sqrt{s}}ds\right)\right)\ \text{for}\ \gamma>0$$

Multiple-argument formulas:

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\right.$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=$$
$$1\Big/\left(0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\right.$$
$$\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\left(-1+2\cos^2\left(\frac{2\pi}{3}\right)\right)\right.$$
$$\left.\left.\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+2\cos\left(\frac{2\pi}{3}\right)\left(1-4\,i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{2\pi}{3}\right)\right)\right)$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=$$

$$1\Big/\left(0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+2\cos\left(\frac{2\pi}{3}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{2\pi}{3}\right)+\left(-1+4\exp\left(-\pi\sqrt{37}\right)\right)\left(-1+2\sin^2\left(\frac{2\pi}{3}\right)\right)\right)\right)$$

$$1\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)=$$

$$1\Big/\left(0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\left(-1+2\cos^2\left(\frac{2\pi}{3}\right)\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\left(-1+4i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{4\pi}{9}\right)\left(-3+4\sin^2\left(\frac{4\pi}{9}\right)\right)\right)\right)$$

From which:

1/8*1/((((1.039778/8 *exp(-Pi*sqrt22)+4372*exp(-Pi*sqrt37) [(1-4*exp(-Pi*sqrt37)) cos ((4Pi)/3)+(1-4i*exp(-Pi*sqrt37)) sin ((4Pi)/3)+16/3 (3+2*exp(Pi/8*sqrt18)) 4372*exp(-Pi*sqrt22)])))+521-18+2

Input interpretation:

$$\frac{1}{8}\times 1\Big/\left(\frac{1.039778}{8}\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{16}{3}\left(3+2\exp\left(\frac{\pi}{8}\sqrt{18}\right)\right)\left(4372\exp\left(-\pi\sqrt{22}\right)\right)\right)\right)+521-18+2$$

i is the imaginary unit

Result:

$$-4096.35639\ldots - 0.0000646811573\ldots\, i$$

Polar coordinates:

$r = 4096.36$ (radius), $\theta = -180.°$ (angle)

$4096.36 \approx 4096 = 64^2$

Alternative representations:

$$1\Big/\left(\left(\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{16}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\left(4372\exp\left(-\pi\sqrt{22}\right)\right)\right)8\right)+521-18+2=505+1\Big/\left(8\left(4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(\frac{4i\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\cos\left(-\frac{5\pi}{6}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)\right)\right)$$

$$1\Big/\left(\left(\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{16}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\left(4372\exp\left(-\pi\sqrt{22}\right)\right)\right)8\right)+521-18+2=505+1\Big/\left(8\left(4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\cosh\left(-\frac{4i\pi}{3}\right)\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)+\cos\left(-\frac{5\pi}{6}\right)\left(1-4i\exp\left(-\pi\sqrt{37}\right)\right)\right)+\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)\right)\right)$$

$$1 \Big/ \left(\left(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{16}{3}\left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right)\left(4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) 8\right) + 521 - 18 + 2 = 505 + 1 \Big/ \left(8\left(4372 \exp\left(-\pi \sqrt{37}\right)\left(\frac{69\,952}{3}\left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \cosh\left(-\frac{4 i \pi}{3}\right)\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) - \cos\left(\frac{11\pi}{6}\right)\left(1 - 4 i \exp\left(-\pi \sqrt{37}\right)\right)\right) + \frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right)\right)\right)$$

Series representations:

$$1 \Big/ \Bigg(\Bigg(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{16}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \right) \left(4372 \exp\left(-\pi \sqrt{22}\right)\right) \right) 8 \Bigg) + 521 - 18 + 2 = 505 + 6.13085 \times 10^{-10} \Big/ \left(\exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(22 - x)}{2\pi} \right\rfloor \right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (22 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \left(6.37473 \times 10^{-10} + \left(1.5 + \exp\left(\frac{1}{8} \pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(18 - x)}{2\pi} \right\rfloor \right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (18 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor \right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) + \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor \right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \left(\left(0.0000428866 - 0.000171546\, i \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor \right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) \sum_{k=0}^{\infty} (-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right) + \left(0.0000214433 - 0.0000857731 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor \right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \right) \sum_{k=0}^{\infty} \frac{\left(-\frac{16}{9}\right)^k \pi^{2k}}{(2k)!} \right) \Bigg) \quad \text{for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$1 \Big/ \Bigg(\Bigg(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{16}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \left(4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) 8 \right) +$$

$$521 - 18 + 2 = 505 + 1 \Big/ \Bigg(8 \Bigg(0.129972 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(22 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (22 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) + 4372 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{1}{8} \pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(18 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (18 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)\right) \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(22 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (22 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) + 2 \left(1 - 4 i \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)\right) \sum_{k=0}^{\infty} (-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right) + \left(1 - 4 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)\right) \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4}{3}\right)^{2k} \pi^{2k}}{(2k)!} \right) \Bigg) \Bigg) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$1 \Big/ \Bigg(\Bigg(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{16}{3}\left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right)\right)\left(4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) 8 \Bigg) + 521 - 18 + 2 = 505 + 6.13085 \times 10^{-10} \Big/ \left(\exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(22 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (22 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right) \left(6.37473 \times 10^{-10} + \left(1.5 + \exp\left(\frac{1}{8} \pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(18 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (18 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right) \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right) + \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right) \left(\left(\left(0.0000214433 - 0.0000857731 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right) \sum_{k=0}^{\infty} \frac{\left(-\frac{16}{9}\right)^k \pi^{2k}}{(2k)!} + \left(0.0000214433 - 0.0000857731\, i \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!}\right)\right) \sum_{k=0}^{\infty} \frac{\left(\frac{3}{4}\right)^{-1-2k} e^{i k \pi} \pi^{1+2k}}{(1 + 2k)!}\right)\right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)$$

Integral representations:

$$1\Big/\left(\left(\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\right.\right.$$
$$\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.\right.$$
$$\left.\left.\left.\frac{16}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\left(4372\exp\left(-\pi\sqrt{22}\right)\right)\right)8\right)+$$
$$521-18+2=505+6.13085\times 10^{-10}\Big/\left(\exp\left(-\pi\sqrt{22}\right)\right.$$
$$\left(6.37473\times 10^{-10}+\left(1.5+\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{37}\right)\right)+\exp\left(-\pi\sqrt{37}\right)$$
$$\int_0^1\left(\pi\cos\left(\frac{4\pi t}{3}\right)\left(0.000028591-0.000114364\,i\exp\left(-\pi\sqrt{37}\right)\right)+\right.$$
$$\pi\left(-0.0000178694+0.0000714776\exp\left(-\pi\sqrt{37}\right)\right)$$
$$\left.\left.\sin\left(\frac{1}{6}\pi(3+5t)\right)\right)dt\right)$$

$$1\Big/\left(\left(\frac{1}{8}\times 1.03978\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\right.\right.$$
$$\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.\right.$$
$$\left.\left.\left.\frac{16}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\left(4372\exp\left(-\pi\sqrt{22}\right)\right)\right)8\right)+$$
$$521-18+2=505+1\Big/\left(8\left(0.129972\exp\left(-\pi\sqrt{22}\right)+\right.\right.$$
$$4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\right.$$
$$\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}-$$
$$\left.\left.\left.\frac{e^{-(4\pi^2)/(9s)+s}\left(-2\pi-3s+4(2i\pi+3s)\exp\left(-\pi\sqrt{37}\right)\right)\sqrt{\pi}}{6\pi s^{3/2}\mathcal{A}}\right.\right.\right.$$
$$\left.\left.\left.ds\right)\right)\right)\quad\text{for}\ \gamma>0$$

$$1 \Big/ \left(\left(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \right.\right.$$
$$\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.$$
$$\left.\left. \frac{16}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \left(4372 \exp\left(-\pi \sqrt{22}\right)\right) \right) 8 \right) +$$
$$521 - 18 + 2 = 505 + 1 \Big/ \left(8 \left(0.129972 \exp\left(-\pi \sqrt{22}\right) + \right.\right.$$
$$4372 \exp\left(-\pi \sqrt{37}\right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \right.$$
$$\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \left(1 - \frac{4\pi}{3} \int_0^1 \sin\left(\frac{4\pi t}{3}\right) dt\right) +$$
$$\left.\left.\left. \frac{\left(1 - 4i \exp\left(-\pi \sqrt{37}\right)\right) \sqrt{\pi}}{3\mathcal{A}} \int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma} \frac{e^{-(4\pi^2)/(\Theta s)+s}}{s^{3/2}} ds \right) \right) \right) \text{ for } \gamma > 0$$

Multiple-argument formulas:

$$1 \Big/ \left(\left(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \right.\right.$$
$$\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.$$
$$\left.\left. \frac{16}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \left(4372 \exp\left(-\pi \sqrt{22}\right)\right) \right) 8 \right) +$$
$$521 - 18 + 2 = 505 + 6.13085 \times 10^{-10} \Big/ \left(\exp\left(-\pi \sqrt{22}\right) \right.$$
$$\left(6.37473 \times 10^{-10} + \left(1.5 + \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{37}\right) \right) +$$
$$\exp\left(-\pi \sqrt{37}\right) \left(-0.0000214433 + \cos^2\left(\frac{2\pi}{3}\right) \left(0.0000428866 - \right.\right.$$
$$\left. 0.000171546 \exp\left(-\pi \sqrt{37}\right)\right) + 0.0000857731 \exp\left(-\pi \sqrt{37}\right) +$$
$$\left.\left. \cos\left(\frac{2\pi}{3}\right) \left(0.0000428866 - 0.000171546\, i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{2\pi}{3}\right) \right) \right)$$

$$1 \Big/ \left(\left(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \right.\right.$$
$$\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right) \right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.$$
$$\left.\left. \frac{16}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \left(4372 \exp\left(-\pi \sqrt{22}\right)\right) \right) 8 \right) +$$
$$521 - 18 + 2 = 505 + 1 \Big/ \left(8 \left(0.129972 \exp\left(-\pi \sqrt{22}\right) + \right.\right.$$
$$4372 \exp\left(-\pi \sqrt{37}\right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \right.$$
$$2 \cos\left(\frac{2\pi}{3}\right) \left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{2\pi}{3}\right) +$$
$$\left.\left.\left.\left. \left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \left(1 - 2 \sin^2\left(\frac{2\pi}{3}\right)\right) \right) \right) \right) \right)$$

$$1 \Big/ \left(\left(\frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \right.\right.$$
$$\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right) \right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.$$
$$\left.\left. \frac{16}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \left(4372 \exp\left(-\pi \sqrt{22}\right)\right) \right) 8 \right) +$$
$$521 - 18 + 2 = 505 + 1 \Big/ \left(8 \left(0.129972 \exp\left(-\pi \sqrt{22}\right) + \right.\right.$$
$$4372 \exp\left(-\pi \sqrt{37}\right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \right.$$
$$2 \cos\left(\frac{2\pi}{3}\right) \left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{2\pi}{3}\right) +$$
$$\left.\left.\left.\left. \left(-1 + 4 \exp\left(-\pi \sqrt{37}\right)\right) \left(-1 + 2 \sin^2\left(\frac{2\pi}{3}\right)\right) \right) \right) \right) \right)$$

From:

ROM.lF-88/40

THE GEOMETRY OF OPEN STRING PARTITION FUNCTIONS - *Massimo Bianchi and Augusto Sagnotti* - Dipartimento di Fisica - Università di Roma II "Tor Vergata" - Via Orazio Raimondo - 00173 Roma - ITALY and I. N. F. N. - Sezione di Roma , ITALY

The period matrices of the three relevant surfaces are of the form

$$\tau = \begin{pmatrix} [\frac{1}{2}]+\tau_1+i\tau_2 & [\frac{1}{2}]+i\tau_{12} \\ [\frac{1}{2}]+i\tau_{12} & [\frac{1}{2}]-\tau_1+i\tau_2 \end{pmatrix} , \qquad (3.28)$$

$$\tau = \begin{pmatrix} [\frac{1}{2}]+\tau_1+i\tau_2 & [\frac{1}{2}]+i\tau_{12} \\ [\frac{1}{2}]+i\tau_{12} & [\frac{1}{2}]-\tau_1+i\tau_2 \end{pmatrix}$$

For $i\tau = 1$ and $\tau = -i$, we obtain:

{{1/2-i+1, 1/2+1}, {1/2+1, 1/2+i+1}}

Input:

$$\begin{pmatrix} \frac{1}{2}-i+1 & \frac{1}{2}+1 \\ \frac{1}{2}+1 & \frac{1}{2}+i+1 \end{pmatrix}$$

i is the imaginary unit

Result:

$$\begin{pmatrix} \frac{3}{2}-i & \frac{3}{2} \\ \frac{3}{2} & \frac{3}{2}+i \end{pmatrix}$$

Dimensions:

2 (rows) × 2 (columns)

Property:

hankel

Trace:

3

Determinant:

1

Inverse:

$$\frac{1}{2}\begin{pmatrix} 3+2i & -3 \\ -3 & 3-2i \end{pmatrix}$$

Characteristic polynomial:

$\lambda^2 - 3\lambda + 1$

Eigenvalues:

$\lambda_1 \approx 2.61803$

2.61803 = square of golden ratio

$\lambda_2 \approx 0.381966$

Eigenvectors:

$v_1 \approx (0.745356 - 0.666667\,i,\ 1)$

$v_2 \approx (-0.745356 - 0.666667\,i,\ 1)$

Diagonalization:

$M = S.J.S^{-1}$

where

$$M = \begin{pmatrix} \frac{3}{2} - i & \frac{3}{2} \\ \frac{3}{2} & \frac{3}{2} + i \end{pmatrix}$$

$$S = \begin{pmatrix} \frac{1}{3}\left(-2i - \sqrt{5}\right) & \frac{1}{3}\left(-2i + \sqrt{5}\right) \\ 1 & 1 \end{pmatrix}$$

$$J = \begin{pmatrix} \frac{1}{2}\left(3 - \sqrt{5}\right) & 0 \\ 0 & \frac{1}{2}\left(3 + \sqrt{5}\right) \end{pmatrix}$$

$$S^{-1} = \begin{pmatrix} -\frac{3}{2\sqrt{5}} & \frac{1}{2} - \frac{i}{\sqrt{5}} \\ \frac{3}{2\sqrt{5}} & \frac{1}{2} + \frac{i}{\sqrt{5}} \end{pmatrix}$$

Now, we have:

$$\xi = \frac{\theta_1(\bar{z}_1 - z_2)\theta_1(\bar{z}_2 - z_1)}{\theta_1(\bar{z}_1 - z_1)\theta_1(\bar{z}_2 - z_2)} \quad . \qquad (3.34)$$

One then finds

$$(\mathrm{R\ det\ Im}\tau)^{-\frac{13}{2}} = 2^{13} \int dp\ |t|^{p^2}\ |\xi|^{-p^2} \quad , \qquad (3.35)$$

For $\tau = 3$ and $\xi = 0.99927$;

$$\left(|t|^{p^2} \right) = 3^2$$

$$\left(|\xi|^{-p^2} \right) = 0.99927^2$$

From

$$(\mathrm{R\ det\ Im}\tau)^{-\frac{13}{2}} = 2^{13} \int dp\ |t|^{p^2}\ |\xi|^{-p^2}$$

we obtain:

2^13 * integrate ((3^2)0.99927^2)x, 0..1

Definite integral:

$$8192 \int_0^1 8.98686\, x\, dx = 36\,810.2$$

36810.2

From the previous expression:

$$2^{10}+\frac{1024}{2^{10}}+22\left(2^8+\frac{256}{2^8}\right)+209\left(2^6+\frac{64}{2^6}\right)+1144\left(2^4+\frac{16}{2^4}\right)+4048\left(2^2+\frac{4}{2^2}\right)+9744$$

= 69696

And for the two last results that are equal to 36810.9 and 36810.2 , we have that:

4096 - 2((2^13 * integrate ((3^2)0.99927^2)x, 0..1)) + 69696

Input:

$$4096-2\left(2^{13}\int_0^1 (3^2\times 0.99927^2)\,x\,dx\right)+69\,696$$

Result:

171.604

171.604

From the previous expression

$$1\Big/\left(\frac{1.039778}{8}\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-4\,i\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{16}{3}\left(3+2\exp\left(\frac{\pi}{8}\sqrt{18}\right)\right)\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)$$

we obtain:

2/((((1.039778 / 8 exp(-Pi*sqrt22)+4372*exp(-Pi*sqrt37) [(1-4*exp(-Pi*sqrt37)) cos ((4Pi)/3) + (1-4i*exp(-Pi*sqrt37)) sin ((4Pi)/3)+16/3 (3+2*exp(Pi/8*sqrt18)) * 4372*exp(-Pi*sqrt22)])))+69696+64^2+2

Input interpretation:

$$2 \Big/ \left(\frac{1.039778}{8} \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{16}{3}\left(3 + 2 \exp\left(\frac{\pi}{8}\sqrt{18}\right)\right) \times 4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) + 69\,696 + 64^2 + 2\right)$$

i is the imaginary unit

Result:

172.2978... −
0.001034899... i

Polar coordinates:

$r = 172.298$ (radius), $\theta = -0.000344144°$ (angle)

172.298

Alternative representations:

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right)\right) + 69\,696 + 64^2 + 2 = 69\,698 + 64^2 + 2 \Big/ \left(4372 \exp\left(-\pi \sqrt{37}\right)\left(\frac{69\,952}{3}\left(3 + 2 \exp\left(\frac{\pi\sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \cosh\left(\frac{4\,i\,\pi}{3}\right)\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) + \cos\left(-\frac{5\pi}{6}\right)\left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right)\right) + \frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right)\right)\right)$$

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \right.$$
$$\left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.\right.$$
$$\left.\left. \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right) \right) + 69\,696 + 64^2 + 2 =$$
$$69\,698 + 64^2 + 2 \Big/ \left(4372 \exp\left(-\pi \sqrt{37}\right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \right.\right.$$
$$\cosh\left(-\frac{4 i \pi}{3}\right)\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) +$$
$$\left.\left. \cos\left(-\frac{5\pi}{6}\right)\left(1 - 4 i \exp\left(-\pi \sqrt{37}\right)\right) \right) + \frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) \right)$$

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \right.$$
$$\left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.\right.$$
$$\left.\left. \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right) \right) + 69\,696 + 64^2 + 2 =$$
$$69\,698 + 64^2 + 2 \Big/ \left(4372 \exp\left(-\pi \sqrt{37}\right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + \right.\right.$$
$$\cosh\left(-\frac{4 i \pi}{3}\right)\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) -$$
$$\left.\left. \cos\left(\frac{11\pi}{6}\right)\left(1 - 4 i \exp\left(-\pi \sqrt{37}\right)\right) \right) + \frac{1}{8} \times 1.03978 \exp\left(-\pi \sqrt{22}\right) \right)$$

Series representations:

$$2 \Big/ \left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978 + 4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)+69\,696+64^2+2 = 73\,794+9.80937\times 10^{-9}\Big/\left(\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(22-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\left(6.37473\times 10^{-10}+\left(1.5+\exp\left(\frac{1}{8}\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(18-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\left(\left(\left(0.0000428866-0.000171546\,i\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\sum_{k=0}^{\infty}(-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right)+\left(0.0000214433-0.0000857731\exp\left(-\pi\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(37-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}\right)\right) \quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right) \right) \right) + 69\,696 + 64^2 + 2 = 73\,794 + 2 \Big/ \left(0.129972 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(22 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (22 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) + 4372 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{1}{8} \pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(18 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (18 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)\right) \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(22 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (22 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right) + 2 \left(1 - 4 i \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)\right) \sum_{k=0}^{\infty} (-1)^k J_{1+2k}\left(\frac{4\pi}{3}\right) + \left(1 - 4 \exp\left(-\pi \exp\left(\pi \mathcal{A} \left\lfloor \frac{\arg(37 - x)}{2\pi} \right\rfloor\right) \sqrt{x} \sum_{k=0}^{\infty} \frac{(-1)^k (37 - x)^k x^{-k} \left(-\frac{1}{2}\right)_k}{k!} \right)\right) \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{4}{3}\right)^{2k} \pi^{2k}}{(2k)!} \right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$2 \Big/ \left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978 + 4372\exp\left(-\pi\sqrt{37}\right)\right.$$
$$\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\right.$$
$$\left.\left.\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)\right)+$$
$$69\,696+64^2+2=73\,794+9.80937\times10^{-9}\Big/$$
$$\left(\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(22-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(22-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right.$$
$$\left(6.37473\times10^{-10}+\left(1.5+\exp\left(\frac{1}{8}\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(18-x)}{2\pi}\right\rfloor\right)\right.\right.\right.$$
$$\left.\left.\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(18-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\exp\left(\right.\right.$$
$$\left.\left.-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(37-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)+$$
$$\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(37-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left(\left(0.0000214433-0.0000857731\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\sqrt{x}\right.\right.\right.$$
$$\left.\left.\left.\sum_{k=0}^{\infty}\frac{(-1)^k\,(37-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\sum_{k=0}^{\infty}\frac{\left(-\frac{16}{9}\right)^k\pi^{2k}}{(2k)!}+\right.$$
$$\left(0.0000214433-0.0000857731\,i\exp\left(-\pi\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(37-x)}{2\pi}\right\rfloor\right)\right.\right.$$
$$\left.\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(37-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)$$
$$\left.\left.\sum_{k=0}^{\infty}\frac{\left(\frac{3}{4}\right)^{-1-2k}e^{i\,k\,\pi}\,\pi^{1+2k}}{(1+2k)!}\right)\right)\ \text{for}\ (x\in\mathbb{R}\ \text{and}\ x<0)$$

Integral representations:

$$2\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)+69\,696+64^2+2=73\,794+9.80937\times 10^{-9}\Big/\left(\exp\left(-\pi\sqrt{22}\right)\left(6.37473\times 10^{-10}+\left(1.5+\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{37}\right)\right)+\exp\left(-\pi\sqrt{37}\right)\int_0^1\left(\pi\cos\left(\frac{4\pi t}{3}\right)\left(0.000028591-0.000114364\,i\exp\left(-\pi\sqrt{37}\right)\right)+\pi\left(-0.0000178694+0.0000714776\exp\left(-\pi\sqrt{37}\right)\right)\sin\left(\frac{1}{6}\pi(3+5t)\right)\right)dt\right)$$

$$2\Big/\left(\frac{1}{8}\exp\left(-\pi\sqrt{22}\right)1.03978+4372\exp\left(-\pi\sqrt{37}\right)\left(\left(\left(1-4\exp\left(-\pi\sqrt{37}\right)\right)\cos\left(\frac{4\pi}{3}\right)+\left(1-i\left(4\exp\left(-\pi\sqrt{37}\right)\right)\right)\sin\left(\frac{4\pi}{3}\right)+\frac{1}{3}\left(3+2\exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right)16\times 4372\exp\left(-\pi\sqrt{22}\right)\right)+69\,696+64^2+2=73\,794+2\Big/\left(0.129972\exp\left(-\pi\sqrt{22}\right)+4372\exp\left(-\pi\sqrt{37}\right)\left(\frac{69\,952}{3}\left(3+2\exp\left(\frac{\pi\sqrt{18}}{8}\right)\right)\exp\left(-\pi\sqrt{22}\right)+\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}-\frac{e^{-(4\pi^2)/(9s)+s}\left(-2\pi-3s+4(2i\pi+3s)\exp\left(-\pi\sqrt{37}\right)\right)\sqrt{\pi}}{6\pi s^{3/2}\mathcal{A}}ds\right)\right)\text{ for }\gamma>0$$

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \right.$$
$$\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.$$
$$\left. \left. \frac{1}{3} \left(3 + 2 \exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right) \right) \right) +$$
$$69\,696 + 64^2 + 2 = 73\,794 + 2 \Big/ \left(0.129972 \exp\left(-\pi \sqrt{22}\right) + \right.$$
$$4372 \exp\left(-\pi \sqrt{37}\right) \left(\frac{69\,952}{3} \left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) - \right.$$
$$1 - 4 \exp\left(-\pi \sqrt{37}\right) \int_{\frac{\pi}{2}}^{\frac{4\pi}{3}} \sin(t)\, dt +$$
$$\left. \left. \frac{\left(1 - 4\, i \exp\left(-\pi \sqrt{37}\right)\right) \sqrt{\pi}}{3\, \mathcal{A}} \int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma} \frac{e^{-(4\pi^2)/(9s)+s}}{s^{3/2}}\, ds \right) \right) \text{ for } \gamma > 0$$

Multiple-argument formulas:

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \right.$$
$$\left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i \left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \right.$$
$$\left. \left. \frac{1}{3} \left(3 + 2 \exp\left(\frac{\sqrt{18}\ \pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right) \right) \right) +$$
$$69\,696 + 64^2 + 2 = 73\,794 + 9.80937 \times 10^{-9} \Big/$$
$$\left(\exp\left(-\pi \sqrt{22}\right) \left(6.37473 \times 10^{-10} + \left(1.5 + \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{37}\right) \right) + \right.$$
$$\exp\left(-\pi \sqrt{37}\right) \left(-0.0000214433 + \cos^2\left(\frac{2\pi}{3}\right) \left(0.0000428866 - \right.\right.$$
$$\left. 0.000171546 \exp\left(-\pi \sqrt{37}\right)\right) + 0.0000857731 \exp\left(-\pi \sqrt{37}\right) +$$
$$\left. \left. \cos\left(\frac{2\pi}{3}\right) \left(0.0000428866 - 0.000171546\, i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{2\pi}{3}\right) \right) \right)$$

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) +$$

$$69\,696 + 64^2 + 2 = 73\,794 + 2 \Big/ \left(0.129972 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right)\left(\frac{69\,952}{3}\left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + 2 \cos\left(\frac{2\pi}{3}\right)\left(1 - 4i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{2\pi}{3}\right) + \left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right)\left(1 - 2 \sin^2\left(\frac{2\pi}{3}\right)\right)\right)\right)$$

$$2 \Big/ \left(\frac{1}{8} \exp\left(-\pi \sqrt{22}\right) 1.03978 + 4372 \exp\left(-\pi \sqrt{37}\right) \left(\left(1 - 4 \exp\left(-\pi \sqrt{37}\right)\right) \cos\left(\frac{4\pi}{3}\right) + \left(1 - i\left(4 \exp\left(-\pi \sqrt{37}\right)\right)\right) \sin\left(\frac{4\pi}{3}\right) + \frac{1}{3}\left(3 + 2 \exp\left(\frac{\sqrt{18}\,\pi}{8}\right)\right) 16 \times 4372 \exp\left(-\pi \sqrt{22}\right)\right)\right) +$$

$$69\,696 + 64^2 + 2 = 73\,794 + 2 \Big/ \left(0.129972 \exp\left(-\pi \sqrt{22}\right) + 4372 \exp\left(-\pi \sqrt{37}\right)\left(\frac{69\,952}{3}\left(3 + 2 \exp\left(\frac{\pi \sqrt{18}}{8}\right)\right) \exp\left(-\pi \sqrt{22}\right) + 2 \cos\left(\frac{2\pi}{3}\right)\left(1 - 4i \exp\left(-\pi \sqrt{37}\right)\right) \sin\left(\frac{2\pi}{3}\right) + \left(-1 + 4 \exp\left(-\pi \sqrt{37}\right)\right)\left(-1 + 2 \sin^2\left(\frac{2\pi}{3}\right)\right)\right)\right)$$

Approximating from the above values we have:

$64^2 - 36810*2 + 69696 =$ **172 = cubic root of Ramanujan cube number 172^3**

From:

AdS Vacua from Dilaton Tadpoles and Form Fluxes
J. Mourad and A. Sagnotti - arXiv:1612.08566v2 [hep-th] 22 Feb 2017

In the heterotic $SO(16) \times SO(16)$ model the sign of α_E is positive, as we have seen in eq. (1.7). As a result, internal non–abelian gauge fields can sustain by themselves the class of vacua under scrutiny. Let us also recall that for this model $\Lambda \simeq \frac{4\pi^2}{25}$ [11].

Once more, large values for h result in large AdS_7 and S_3 radii, and also in small values for the string coupling g_s. These results are expected to translate into small α' and string loop corrections.

$$\frac{h^2}{32} = \frac{e^{-4\phi}}{\left[1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right]^7} \left[42\left(1 + \sqrt{1 + \frac{\Lambda}{3} e^{2\phi}}\right) - 13\,\Lambda\, e^{2\phi}\right] .$$

(2.10)

For h = 64; $\Lambda \approx (4Pi\text{^}2)/25$; $e^{2\phi} = e^{\pi\sqrt{22}}$; ; $e^{-4\phi} = e^{-2\pi\sqrt{22}}$

Also for this equation, we have utilized values concerning a Chapter of the fundamental Ramanujan paper "Modular equations and approximations to π". Also the results 64 and 4096 are numbers inherent the same work. (see Observations)

We obtain:

(64^2)/32 = (exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)]^7
[42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)]

(exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7
[42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)]

Input:

$$\frac{\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)^7}$$
$$\left(42\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)-13\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)$$

Exact result:

$$\frac{e^{-2\sqrt{22}\,\pi}\left(42\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}e^{\sqrt{22}\,\pi}\,\pi^2\right)}{\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7}$$

Decimal approximation:

$-3.069374913506445035627065973742721525476219343613038\ldots\times10^{-27}$

-3.0693749…*10^{-27}

Alternate forms:

$$\frac{13\,668\,750\,e^{-2\sqrt{22}\,\pi}\left(525-26\,e^{\sqrt{22}\,\pi}\,\pi^2+35\sqrt{3\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)}{\left(15+\sqrt{3\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)^7}$$
$$\frac{168\,750\,e^{-2\sqrt{22}\,\pi}\left(525\sqrt{3}-26\sqrt{3}\,e^{\sqrt{22}\,\pi}\,\pi^2+105\sqrt{75+4\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)}{\left(5\sqrt{3}+\sqrt{75+4\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7}$$

$$e^{-2\sqrt{22}\,\pi}\left(\frac{7\,176\,093\,750}{\left(15+\sqrt{3\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)^7}+\frac{478\,406\,250\sqrt{3\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}}{\left(15+\sqrt{3\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)^7}\right)-\frac{355\,387\,500\,e^{-\sqrt{22}\,\pi}\,\pi^2}{\left(15+\sqrt{3\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)^7}$$

Series representations:

$$\frac{\left(42\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times3}}\right)-\frac{1}{25}\left(4\pi^2\right)13\exp\left(\pi\sqrt{22}\right)\right)\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times3}}\right)^7}=$$

$$\left(13\,668\,750\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\left(525-26\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+35\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)^7$$

$$\frac{\left(42\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)-\frac{1}{25}\left(4\pi^2\right)13\exp\left(\pi\sqrt{22}\right)\right)\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)^7}=$$

$$\left(13\,668\,750\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(525-26\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+35\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)^7$$

$$\frac{\left(42\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)-\frac{1}{25}\left(4\pi^2\right)13\exp\left(\pi\sqrt{22}\right)\right)\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)^7}=$$

$$\left(13\,668\,750\exp\left(-2\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)\left(525-26\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)+35\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}\right)\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}\right)^7$$

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

1/((((exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7
[42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-
13*(exp(Pi*sqrt22))*((4Pi^2)/25)]))

Input:

$$1 \Bigg/ \left(\frac{\exp(-2\pi\sqrt{22})}{\left(1+\sqrt{1+\exp(\pi\sqrt{22})\left(\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)\right)}\right)^7} \left(42\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)\right)}\right)-13\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{25}(4\pi^2)\right)\right)\right)$$

Exact result:

$$\frac{e^{2\sqrt{22}\,\pi}\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7}{42\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}e^{\sqrt{22}\,\pi}\,\pi^2}$$

Decimal approximation:

$-3.25799235407708108356677773171709601086018594873991 0\ldots \times 10^{26}$

$-3.25799235\ldots *10^{26}$

Alternate forms:

$$\frac{e^{2\sqrt{22}\,\pi}\left(15+\sqrt{3\left(75+4e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)^7}{13\,668\,750\left(525-26e^{\sqrt{22}\,\pi}\,\pi^2+35\sqrt{3\left(75+4e^{\sqrt{22}\,\pi}\,\pi^2\right)}\right)}$$

$$\frac{e^{2\sqrt{22}\,\pi}\left(5\sqrt{3}+\sqrt{75+4\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7}{168\,750\left(525\sqrt{3}-26\sqrt{3}\;e^{\sqrt{22}\,\pi}\,\pi^2+105\sqrt{75+4\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)}$$

$$\frac{64\,e^{2\sqrt{22}\,\pi}}{42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2}+$$

$$\frac{448\,e^{3\sqrt{22}\,\pi}\,\pi^2}{75\left(42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}+$$

$$\frac{896\,e^{4\sqrt{22}\,\pi}\,\pi^4}{5625\left(42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}+$$

$$\frac{448\,e^{5\sqrt{22}\,\pi}\,\pi^6}{421\,875\left(42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)}+$$

$$\frac{7\,e^{2\sqrt{22}\,\pi}\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}}{42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2}+$$

$$\frac{35\,e^{2\sqrt{22}\,\pi}\left(1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)^{3/2}}{42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2}+$$

$$\frac{21\,e^{2\sqrt{22}\,\pi}\left(1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)^{5/2}}{42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2}+$$

$$\frac{e^{2\sqrt{22}\,\pi}\left(1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)^{7/2}}{42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2}$$

Series representations:

$$\frac{1}{\left(42\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)-\frac{1}{25}\left(4\pi^2\right)13\exp\left(\pi\sqrt{22}\right)\right)\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)^7}=$$

$$\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)^7\Bigg/$$

$$\left(13\,668\,750\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\left(525-26\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+35\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)\right)$$

$$\frac{1}{\left(42\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)-\frac{1}{25}\left(4\pi^2\right)13\exp\left(\pi\sqrt{22}\right)\right)\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)^7}=$$

$$\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)^7\Bigg/\left(13\,668\,750\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(525-26\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+35\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)\right)$$

$$\frac{1}{\left(42\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)-\frac{1}{25}\left(4\pi^2\right)13\exp\left(\pi\sqrt{22}\right)\right)\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\frac{\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}{25\times 3}}\right)^7}=$$

$$\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)}\right)^7\Bigg/$$

$$\left(13\,668\,750\exp\left(-\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)\right.$$

$$\left(525-26\pi^2\exp\left(\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)+\right.$$

$$\left.\left.35\sqrt{3}\sqrt{75+4\pi^2\exp\left(\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)}\right)\right)$$

(64^2)/32 = x ((((exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7 [42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)]))

Input:

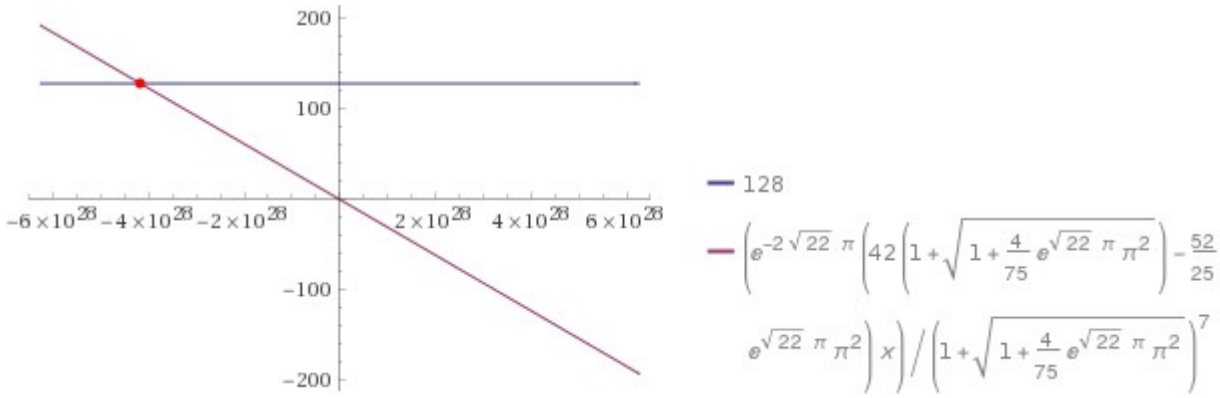
$$\frac{64^2}{32}=x\left(\frac{\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)^7}\right.$$

$$\left.\left(42\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)-13\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)\right)$$

Exact result:

$$128 = \frac{e^{-2\sqrt{22}\,\pi}\left(42\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)-\frac{52}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2\right)x}{\left(1+\sqrt{1+\frac{4}{75}\,e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7}$$

Plot:



Solution:

$x \approx -41\,702\,302\,132\,186\,637\,789\,869\,843\,166$

-4.170230213218663778986984316 6 × 10^{28}

We obtain also:

-417023021321866377898698431 66((((exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7 [42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)]))) -3

Input:

$$-41\,702\,302\,132\,186\,637\,789\,869\,843\,166\left(\frac{\exp\left(-2\,\pi\,\sqrt{22}\right)}{\left(1+\sqrt{1+\exp\left(\pi\,\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\,\pi^2\right)\right)\right)}\right)^7}\left(42\left(1+\sqrt{1+\exp\left(\pi\,\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\,\pi^2\right)\right)\right)}\right)-13\exp\left(\pi\,\sqrt{22}\right)\left(\frac{1}{25}\left(4\,\pi^2\right)\right)\right)-3$$

Exact result:

$$-3-\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,e^{-2\sqrt{22}\,\pi}\left(42\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)-\frac{52}{25}e^{\sqrt{22}\,\pi}\pi^2\right)\right)\Big/\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)^7$$

Decimal approximation:

124.99999999999999755110193244820636024440537710702469372 6...

124.9999… ≈ 125 result very near to the Higgs boson mass 125.18 GeV

Alternate forms:

$$-3-\left(7\,037\,263\,484\,806\,495\,127\,040\,536\,034\,262\,500\,e^{-2\sqrt{22}\,\pi}\left(525\sqrt{3}-26\sqrt{3}\,e^{\sqrt{22}\,\pi}\pi^2+105\sqrt{75+4\,e^{\sqrt{22}\,\pi}\pi^2}\right)\right)\Big/\left(5\sqrt{3}+\sqrt{75+4\,e^{\sqrt{22}\,\pi}\pi^2}\right)^7$$

$$-3-\frac{1\,751\,496\,689\,551\,838\,787\,174\,533\,412\,972\,e^{-2\sqrt{22}\,\pi}}{\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)^7}+\frac{2\,168\,519\,710\,873\,705\,165\,073\,231\,844\,632\,e^{-\sqrt{22}\,\pi}\pi^2}{25\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)^7}-\frac{1\,751\,496\,689\,551\,838\,787\,174\,533\,412\,972\,e^{-2\sqrt{22}\,\pi}\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}}{\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)^7}$$

$$-\left(\left(3\left(135\,000\,000\sqrt{3}\;+\right.\right.\right.$$

$$1\,231\,521\,109\,841\,136\,647\,232\,093\,805\,995\,937\,500\sqrt{3}\;e^{-2\sqrt{22}\,\pi}\;-$$
$$60\,989\,616\,868\,322\,957\,767\,684\,645\,630\,275\,000\sqrt{3}\;e^{-\sqrt{22}\,\pi}\,\pi^2\;+$$
$$12\,600\,000\sqrt{3}\;e^{\sqrt{22}\,\pi}\,\pi^2+336\,000\sqrt{3}\;e^{2\sqrt{22}\,\pi}\,\pi^4+2240\sqrt{3}\;e^{3\sqrt{22}\,\pi}$$
$$\pi^6+2\,953\,125\left(1+83\,404\,604\,264\,373\,275\,579\,739\,686\,332\;e^{-2\sqrt{22}\,\pi}\right)$$
$$\sqrt{75+4\,e^{\sqrt{22}\,\pi}\,\pi^2}\;+196\,875\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)^{3/2}+$$
$$\left.\left.1575\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)^{5/2}+\left(75+4\,e^{\sqrt{22}\,\pi}\,\pi^2\right)^{7/2}\right)\right)\Big/$$
$$\left.\left(5\sqrt{3}\;+\sqrt{75+4\,e^{\sqrt{22}\,\pi}\,\pi^2}\;\right)^7\right)$$

Series representations:

$$-\left(\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,\exp\left(-2\pi\sqrt{22}\right)\left(42\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)-\frac{1}{25}(4\pi^2)\,13\exp\left(\pi\sqrt{22}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)^7\right)-3=$$

$$-\left(\left(81\left(405\,000\,000+3\,694\,563\,329\,523\,409\,941\,696\,281\,417\,987\,812\,500\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+37\,800\,000\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)-182\,968\,850\,604\,968\,873\,303\,053\,936\,890\,825\,000\,\pi^2\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+1\,008\,000\,\pi^4\exp^2\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+6720\,\pi^6\exp^3\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+2\,953\,125\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}+246\,304\,221\,968\,227\,329\,446\,418\,761\,199\,187\,500\sqrt{3}\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}+196\,875\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{3/2}+1575\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{5/2}+\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{7/2}\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)^7\right)$$

$$-\left(\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,\exp\left(-2\pi\sqrt{22}\right)\left(42\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)-\frac{1}{25}(4\pi^2)\,13\exp\left(\pi\sqrt{22}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)^7\right)-3=$$

$$-\left(\left(81\left(405\,000\,000+3\,694\,563\,329\,523\,409\,941\,696\,281\,417\,987\,812\,500\right.\right.\right.$$

$$\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$37\,800\,000\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)-$$

$$182\,968\,850\,604\,968\,873\,303\,053\,936\,890\,825\,000\pi^2$$

$$\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$1\,008\,000\pi^4\exp^2\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$6720\pi^6\exp^3\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$2\,953\,125\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$246\,304\,221\,968\,227\,329\,446\,418\,761\,199\,187\,500$$

$$\sqrt{3}\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$196\,875\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{3/2}+$$

$$1575\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{5/2}+$$

$$\left.\left.\left.\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{7/2}\right)\right)\Big/$$

$$\left.\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)^7\right)$$

$$-\left(\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,\exp\left(-2\,\pi\,\sqrt{22}\right)\left(42\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})\,(4\,\pi^2)}{25\times 3}}\right)-\frac{1}{25}\,(4\,\pi^2)\,13\exp\left(\pi\sqrt{22}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})\,(4\,\pi^2)}{25\times 3}}\right)^7\right)-3=$$

$$-\left(\left(81\left(405\,000\,000+3\,694\,563\,329\,523\,409\,941\,696\,281\,417\,987\,812\,500\,\exp\left(-2\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+37\,800\,000\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)-182\,968\,850\,604\,968\,873\,303\,053\,936\,890\,825\,000\,\pi^2\exp\left(-2\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+1\,008\,000\,\pi^4\exp^2\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+6720\,\pi^6\exp^3\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+2\,953\,125\,\sqrt{3}\sqrt{75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)}+246\,304\,221\,968\,227\,329\,446\,418\,761\,199\,187\,500\,\sqrt{3}\exp\left(-2\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\sqrt{75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)}+196\,875\,\sqrt{3}\left(75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\right)^{3/2}+1575\,\sqrt{3}\left(75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\right)^{5/2}+\sqrt{3}\left(75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\right)^{7/2}\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)}\right)^7\right)$$

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

and:

-41702302132186637789869843166((((exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7 [42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)]))+11

Input:

$$-41\,702\,302\,132\,186\,637\,789\,869\,843\,166\left(\frac{\exp(-2\pi\sqrt{22})}{\left(1+\sqrt{1+\exp(\pi\sqrt{22})\left(\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)\right)}\right)^7}\left(42\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}(4\pi^2)\right)\right)}\right)-13\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{25}(4\pi^2)\right)\right)\right)+11$$

Exact result:

$$11-\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,e^{-2\sqrt{22}\,\pi}\left(42\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)-\frac{52}{25}e^{\sqrt{22}\,\pi}\pi^2\right)\right)\Big/\left(1+\sqrt{1+\frac{4}{75}e^{\sqrt{22}\,\pi}\pi^2}\right)^7$$

Decimal approximation:

138.99999999999999975511019324482063602444053771070246937 26...

138.9999… ≈ 139 result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$11-\left(7\,037\,263\,484\,806\,495\,127\,040\,536\,034\,262\,500\,e^{-2\sqrt{22}\,\pi}\left(525\sqrt{3}-26\sqrt{3}\,e^{\sqrt{22}\,\pi}\pi^2+105\sqrt{75+4e^{\sqrt{22}\,\pi}\pi^2}\right)\right)\Big/\left(5\sqrt{3}+\sqrt{75+4e^{\sqrt{22}\,\pi}\pi^2}\right)^7$$

$$11 - \frac{1\,751\,496\,689\,551\,838\,787\,174\,533\,412\,972\, e^{-2\sqrt{22}\,\pi}}{\left(1+\sqrt{1+\frac{4}{75}\, e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7} +$$

$$\frac{2\,168\,519\,710\,873\,705\,165\,073\,231\,844\,632\, e^{-\sqrt{22}\,\pi}\,\pi^2}{25\left(1+\sqrt{1+\frac{4}{75}\, e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7} -$$

$$\frac{1\,751\,496\,689\,551\,838\,787\,174\,533\,412\,972\, e^{-2\sqrt{22}\,\pi}\,\sqrt{1+\frac{4}{75}\, e^{\sqrt{22}\,\pi}\,\pi^2}}{\left(1+\sqrt{1+\frac{4}{75}\, e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7}$$

$$\left(1\,485\,000\,000\sqrt{3} -\right.$$

$$3\,694\,563\,329\,523\,409\,941\,696\,281\,417\,987\,812\,500\sqrt{3}\, e^{-2\sqrt{22}\,\pi} +$$
$$182\,968\,850\,604\,968\,873\,303\,053\,936\,890\,825\,000\sqrt{3}\, e^{-\sqrt{22}\,\pi}\,\pi^2 +$$
$$138\,600\,000\sqrt{3}\, e^{\sqrt{22}\,\pi}\,\pi^2 + 3\,696\,000\sqrt{3}\, e^{2\sqrt{22}\,\pi}\,\pi^4 + 24\,640\sqrt{3}\, e^{3\sqrt{22}\,\pi}\,\pi^6 -$$
$$2\,953\,125\left(250\,213\,812\,793\,119\,826\,739\,219\,058\,996\, e^{-2\sqrt{22}\,\pi} - 11\right)$$
$$\sqrt{75+4\, e^{\sqrt{22}\,\pi}\,\pi^2} + 2\,165\,625\left(75+4\, e^{\sqrt{22}\,\pi}\,\pi^2\right)^{3/2} +$$
$$\left.17\,325\left(75+4\, e^{\sqrt{22}\,\pi}\,\pi^2\right)^{5/2} + 11\left(75+4\, e^{\sqrt{22}\,\pi}\,\pi^2\right)^{7/2}\right) /$$
$$\left(5\sqrt{3} + \sqrt{75+4\, e^{\sqrt{22}\,\pi}\,\pi^2}\right)^7$$

Series representations:

$$-\left(\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,\exp\left(-2\pi\sqrt{22}\right)\left(42\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)-\frac{1}{25}(4\pi^2)\,13\exp\left(\pi\sqrt{22}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)^7\right)+11=$$

$$\left(27\left(4\,455\,000\,000-11\,083\,689\,988\,570\,229\,825\,088\,844\,253\,963\,437\,500\,\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+415\,800\,000\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+548\,906\,551\,814\,906\,619\,909\,161\,810\,672\,475\,000\,\pi^2\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+11\,088\,000\,\pi^4\exp^2\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+73\,920\,\pi^6\exp^3\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+32\,484\,375\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}-738\,912\,665\,904\,681\,988\,339\,256\,283\,597\,562\,500\sqrt{3}\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}+2\,165\,625\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{3/2}+17\,325\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{5/2}+11\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{7/2}\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)^7$$

$$-\left(\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,\exp\left(-2\pi\sqrt{22}\right)\left(42\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)-\frac{1}{25}(4\pi^2)\,13\exp\left(\pi\sqrt{22}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})(4\pi^2)}{25\times 3}}\right)^7\right)+11=$$

$$\left(27\left(4\,455\,000\,000-11\,083\,689\,988\,570\,229\,825\,088\,844\,253\,963\,437\,500\right.\right.$$

$$\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$415\,800\,000\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$548\,906\,551\,814\,906\,619\,909\,161\,810\,672\,475\,000\pi^2$$

$$\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$11\,088\,000\pi^4\exp^2\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$73\,920\pi^6\exp^3\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$32\,484\,375\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}-$$

$$738\,912\,665\,904\,681\,988\,339\,256\,283\,597\,562\,500$$

$$\sqrt{3}\exp\left(-2\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$2\,165\,625\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{3/2}+$$

$$17\,325\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{5/2}+$$

$$\left.\left.11\sqrt{3}\left(75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{7/2}\right)\right)\Big/$$

$$\left(15+\sqrt{3}\sqrt{75+4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)^7$$

$$-\left(\left(41\,702\,302\,132\,186\,637\,789\,869\,843\,166\,\exp\left(-2\,\pi\sqrt{22}\right)\left(42\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})\,(4\,\pi^2)}{25\times 3}}\right)-\frac{1}{25}\,(4\,\pi^2)\,13\exp\left(\pi\sqrt{22}\right)\right)\right)\Big/\left(1+\sqrt{1+\frac{\exp(\pi\sqrt{22})\,(4\,\pi^2)}{25\times 3}}\right)^7\right)+11=$$

$$\left(27\left(4\,455\,000\,000-11\,083\,689\,988\,570\,229\,825\,088\,844\,253\,963\,437\,500\,\exp\left(-2\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+415\,800\,000\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+548\,906\,551\,814\,906\,619\,909\,161\,810\,672\,475\,000\,\pi^2\exp\left(-2\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+11\,088\,000\,\pi^4\exp^2\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+73\,920\,\pi^6\exp^3\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)+32\,484\,375\sqrt{3}\sqrt{75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)}-738\,912\,665\,904\,681\,988\,339\,256\,283\,597\,562\,500\,\sqrt{3}\exp\left(-2\,\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\sqrt{75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)}+2\,165\,625\sqrt{3}\left(75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\right)^{3/2}+17\,325\sqrt{3}\left(75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\right)^{5/2}+11\sqrt{3}\left(75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)\right)^{7/2}\right)\Big/\left(15+\sqrt{3}\sqrt{75+4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k\,z_0^{-k}}{k!}\right)}\right)^7$$

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

and again:

27*1/2(((-4.1702302132186e+28((((exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7 [42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)])))))

Input interpretation:

$$27\times\frac{1}{2}\left(-4.1702302132186\times 10^{28}\left(\frac{\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)^7}\left(42\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)-13\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)\right)\right)$$

Result:

1728.0000000000...

1728

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

With regard 27 (From Wikipedia):

"The fundamental group of the complex form, compact real form, or any algebraic version of E_6 is the cyclic group $\mathbb{Z}/3\mathbb{Z}$, and its outer automorphism group is the cyclic group $\mathbb{Z}/2\mathbb{Z}$. Its fundamental representation is 27-dimensional (complex), and a basis is given by the 27 lines on a cubic surface. The dual representation, which is inequivalent, is also 27-dimensional. In particle physics, E_6 plays a role in some grand unified theories".

[27*1/2(((-4.1702302132186e+28((((exp(-2Pi*sqrt22))/[1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5]^7 [42(1+(1+(exp(Pi*sqrt22))*(((4Pi^2)/25)/3))^0.5)-13*(exp(Pi*sqrt22))*((4Pi^2)/25)])))))]^1/15

Input interpretation:

$$\left(27\times\frac{1}{2}\left(-4.1702302132186\times 10^{28}\left(\frac{\exp\left(-2\pi\sqrt{22}\right)}{\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)^7}\right.\right.\right.$$
$$\left.\left.\left.\left(42\left(1+\sqrt{1+\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{3}\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)}\right)-\right.\right.\right.$$
$$\left.\left.\left.13\exp\left(\pi\sqrt{22}\right)\left(\frac{1}{25}\left(4\pi^2\right)\right)\right)\right)\right)\text{^}(1/15)$$

Result:

1.64375182951722...

$1.64375182\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Now, we have that

$$e^{2C} = \frac{\xi}{2}\frac{e^{-\frac{\phi}{2}}}{1-\sqrt{1-\xi\Lambda e^{2\phi}}}, \qquad (2.12)$$

$$\frac{h^2}{3} = \xi^3\frac{\left[\frac{17\Lambda}{24}e^{2\phi}-\frac{1}{\xi}\left(1-\sqrt{1-\xi\Lambda e^{2\phi}}\right)\right]}{\left(1-\sqrt{1-\xi\Lambda e^{2\phi}}\right)^3},$$

We take the second relation

$$\frac{h^2}{3} = \xi^3 \frac{\left[\frac{17\Lambda}{24} e^{2\phi} - \frac{1}{\xi}\left(1 - \sqrt{1 - \xi\Lambda e^{2\phi}}\right)\right]}{\left(1 - \sqrt{1 - \xi\Lambda e^{2\phi}}\right)^3}$$

and for the same values of previous expression,

h = 64; $\Lambda \approx (4Pi^2)/25$; $e^{2\phi} = e^{\pi\sqrt{22}}$; $\xi = 1$

we obtain:

[17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3

Input:

$$\frac{\frac{17}{24}\left(\frac{1}{25}(4\pi^2)\right)\exp(\pi\sqrt{22}) - \left(1 - \sqrt{1 - \left(\frac{1}{25}(4\pi^2)\right)\exp(\pi\sqrt{22})}\right)}{\left(1 - \sqrt{1 - \left(\frac{1}{25}(4\pi^2)\right)\exp(\pi\sqrt{22})}\right)^3}$$

Exact result:

$$\frac{-1 + \frac{17}{150} e^{\sqrt{22}\,\pi}\,\pi^2 + i\sqrt{\frac{4}{25} e^{\sqrt{22}\,\pi}\,\pi^2 - 1}}{\left(1 - i\sqrt{\frac{4}{25} e^{\sqrt{22}\,\pi}\,\pi^2 - 1}\right)^3}$$

Decimal approximation:

$-2.8394901129447259431420335745567639337709332468954 5\ldots \times 10^{-7} - 0.0003558618692688902497092875714318133712947722607253 29\ldots\, i$

Polar coordinates:

$r \approx 0.000355862$ (radius), $\theta \approx -90.0457°$ (angle)

0.000355862

Alternate forms:

$$\frac{5\left(150\,i-17\,i\,e^{\sqrt{22}\,\pi}\,\pi^2+30\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)}{6\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^3}$$

$$\frac{85\,e^{\sqrt{22}\,\pi}\,\pi^2}{6\left(5-i\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)^3}+\frac{25}{\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^2}$$

$$-\frac{25\,e^{-2\sqrt{22}\,\pi}\left(27\,e^{\sqrt{22}\,\pi}\,\pi^2-125\right)}{96\,\pi^4}-\frac{5\,i\,e^{-2\sqrt{22}\,\pi}\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\left(17\,e^{\sqrt{22}\,\pi}\,\pi^2-125\right)}{96\,\pi^4}$$

Series representations:

$$\frac{\frac{\left(4\pi^2\right)\exp\left(\pi\sqrt{22}\right)}{25\times 24}17-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)^3}=$$

$$-\left(\left(5\left(-150+17\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+30\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)\right)\Big/\left(6\left(-5+\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)^3\right)\right)$$

$$\frac{\left((4\pi^2)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)^3}=$$

$$-\left(\left(\left(5\left(-150+17\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+\right.\right.\right.$$

$$\left.\left.\left.30\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)\right)\Big/$$

$$\left(6\left(-5+\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)^3\right)\Bigg)$$

$$\frac{\left((4\pi^2)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)^3}=$$

$$-\left(\left(\left(5\left(-150+17\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)+\right.\right.\right.$$

$$\left.\left.\left.30\sqrt{25-4\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}\right)\right)\Big/$$

$$\left(6\left(-5+\sqrt{25-4\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}\right)^3\right)\Bigg)$$

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

We note that from the previous expression, we obtain:

1/((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3)))

Input:

$$\frac{1}{\frac{17}{24}\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)-\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)}{\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)^3}$$

Exact result:

$$\frac{\left(1-i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)^3}{-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}$$

Decimal approximation:

$-2.24221458364132274394744269644128297425809707125351561 83\ldots +$
$2810.07730718624275018117060216796188945512539546680601 87\ldots\, i$

Polar coordinates:

$r \approx 2810.08$ (radius), $\theta \approx 90.0457°$ (angle)

2810.08

Alternate forms:

$$\frac{6\,i\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^3}{5\left(-150+17\,e^{\sqrt{22}\,\pi}\,\pi^2+30\,i\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)}$$

$$\frac{6\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^3}{5\left(150\,i-17\,i\,e^{\sqrt{22}\,\pi}\,\pi^2+30\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)}$$

$$\frac{6\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^3}{150\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)-85\,i\,e^{\sqrt{22}\,\pi}\,\pi^2}$$

Expanded form:

$$\frac{4}{-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}-\frac{12\,e^{\sqrt{22}\,\pi}\,\pi^2}{25\left(-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)}-\frac{4\,i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}{-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}+\frac{4\,i\,e^{\sqrt{22}\,\pi}\,\pi^2\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}{25\left(-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)}$$

Series representations:

$$\frac{1}{\frac{\left((4\pi^2)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)}=\frac{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)^3}{-\left(\left(\left(6\left(-5+\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)\right)^3\right)\Big/\left(5\left(-150+17\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+30\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)\right)\right)}$$

$$\frac{1}{\frac{\left(\left(4\pi^2\right)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)^3}=$$

$$-\left(\left(\left(6\left(-5+\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)^3\right)\right)\Big/$$

$$\left(5\left(-150+17\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+\right.\right.$$

$$\left.\left.30\sqrt{25-4\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)\right)$$

$$\frac{1}{\frac{\left(\left(4\pi^2\right)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)^3}=$$

$$-\left(\left(\left(6\left(-5+\sqrt{25-4\pi^2\exp\left(\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)}\right)^3\right)\right)\Big/$$

$$\left(5\left(-150+17\pi^2\exp\left(\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)+\right.\right.$$

$$\left.\left.30\sqrt{25-4\pi^2\exp\left(\frac{\pi\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}21^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)}\right)\right)$$

From which:

1/((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3))) - 762i

where

762 = 791 – 29 ,

where 791 is the cubic root of Ramanujan cube number 791^3 and 29 is a Lucas number

Input:

$$\frac{1}{\frac{17}{24}\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)-\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)}{\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)^3} - 762\,i$$

i is the imaginary unit

Exact result:

$$-762\,i+\frac{\left(1-i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)^3}{-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}$$

Decimal approximation:

$-2.24221458364132274394744269644128297425809707125351561 83\ldots +$
$2048.07730718624275018117060216796188945512539546680601 87\ldots\,i$

Polar coordinates:

$r \approx 2048.08$ (radius), $\theta \approx 90.0627°$ (angle)

$2048.08 \approx 2048 = 64^2 / 2$

We observe that $762 = \mathbf{791} - 29$ (as above)

Alternate forms:

$$-762\,i+\frac{6\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^3}{5\left(150\,i-17\,i\,e^{\sqrt{22}\,\pi}\,\pi^2+30\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)}$$

$$-762\,i+\frac{6\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\;+5\,i\right)^3}{150\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\;+5\,i\right)-85\,i\,e^{\sqrt{22}\,\pi}\,\pi^2}$$

$$\left(6\left((95\,250-500\,i)-(10\,795-60\,i)\,e^{\sqrt{22}\,\pi}\,\pi^2-\right.\right.$$
$$\left.\left.(75+19\,050\,i)\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\;+\left(4\,e^{\sqrt{22}\,\pi}\,\pi^2-25\right)^{3/2}\right)\right)\Big/$$
$$\left(5\left(150\,i-17\,i\,e^{\sqrt{22}\,\pi}\,\pi^2+30\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)\right)$$

Expanded form:

$$-762\,i+\frac{4}{-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}-$$
$$\frac{12\,e^{\sqrt{22}\,\pi}\,\pi^2}{25\left(-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)}-$$
$$\frac{4\,i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}{-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}+$$
$$\frac{4\,i\,e^{\sqrt{22}\,\pi}\,\pi^2\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}}{25\left(-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)}$$

Series representations:

$$\frac{1}{\frac{\left((4\pi^2)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)(4\pi^2)}\right)^3}-i\,762=$$

$$-\left(\left(\left(6\left(-500-95\,250\,i+60\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+10\,795\,i\,\pi^2\exp\left(\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+75\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}+\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.19\,050\,i\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}+\right.\right.\right.$$

$$\left.\left.\left.\left(25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)\right)^{3/2}\right)\right)\Big/$$

$$\left(5\left(-150+17\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)+\right.\right.$$

$$\left.\left.30\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}21^{-k}\binom{\frac{1}{2}}{k}\right)}\right)\right)$$

$$\frac{1}{\frac{\left(\left(4\pi^2\right)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)^3}-i\,762=$$

$$-\left(\left(\left(6\left(-500-95\,250\,i+60\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+\right.\right.\right.\right.$$

$$10\,795\,i\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+$$

$$75\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$19\,050\,i\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}+$$

$$\left.\left.\left.\left(25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\right)^{3/2}\right)\right)\Big/$$

$$\left(5\left(-150+17\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+\right.\right.$$

$$\left.\left.30\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{21}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{21}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}\right)\right)$$

$$\frac{1}{\frac{\left(\left(4\pi^2\right)\exp\left(\pi\sqrt{22}\right)\right)17}{25\times 24}-\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)}{\left(1-\sqrt{1-\frac{1}{25}\exp\left(\pi\sqrt{22}\right)\left(4\pi^2\right)}\right)^3}-i\,762=$$

$$-\left(\left(\left(6\left(-500-95\,250\,i+60\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)+\right.\right.\right.\right.$$

$$10\,795\,i\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)+$$

$$75\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}+$$

$$19\,050\,i\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}+$$

$$\left.\left.\left(25-4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)\right)^{3/2}\right)\right)\Big/$$

$$\left(5\left(-150+17\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)+\right.\right.$$

$$\left.\left.30\sqrt{25-4\,\pi^2\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(22-z_0)^k z_0^{-k}}{k!}\right)}\right)\right)$$

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

We have that:

((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3)))x = (64^2)/3

Input:

$$\frac{\frac{17}{24}\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)-\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)}{\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)^3}\,x=\frac{64^2}{3}$$

Exact result:

$$\frac{\left(-1+\frac{17}{150}\,e^{\sqrt{22}\,\pi}\,\pi^2+i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)x}{\left(1-i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)^3}=\frac{4096}{3}$$

Alternate forms:

$$\frac{5\left(150\,i-17\,i\,e^{\sqrt{22}\,\pi}\,\pi^2+30\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)x}{6\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^3}=\frac{4096}{3}$$

$$\frac{25\,x}{\left(\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}+5\,i\right)^2}+\frac{85\,e^{\sqrt{22}\,\pi}\,\pi^2\,x}{6\left(5-i\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\right)^3}=\frac{4096}{3}$$

$$\frac{i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\;x}{\left(1-i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)^3}+$$

$$\frac{17\,e^{\sqrt{22}\,\pi}\,\pi^2\,x}{150\left(1-i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)^3}-\frac{x}{\left(1-i\sqrt{\frac{4}{25}\,e^{\sqrt{22}\,\pi}\,\pi^2-1}\right)^3}-\frac{4096}{3}=0$$

Alternate form assuming x is real:

$$-\frac{25\,e^{-2\sqrt{22}\,\pi}\left(27\,e^{\sqrt{22}\,\pi}\,\pi^2-125\right)x}{96\,\pi^4}-$$

$$\frac{5\,i\,e^{-2\sqrt{22}\,\pi}\sqrt{4\,e^{\sqrt{22}\,\pi}\,\pi^2-25}\,\left(17\,e^{\sqrt{22}\,\pi}\,\pi^2-125\right)x}{96\,\pi^4}=\frac{4096}{3}$$

Complex solution:

$x\approx -3061+3\,836\,692\,i$

Input:

$-3061 + 3836692\,i$

i is the imaginary unit

Polar coordinates:

$r \approx 3.83669 \times 10^6$ (radius), $\theta \approx 90.0457°$ (angle)

$3.83669*10^6$

((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3))) * 3.83669×10^6

Input interpretation:

$$\frac{\frac{17}{24}\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right) - \left(1 - \sqrt{1 - \left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)}{\left(1 - \sqrt{1 - \left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)^3} \times 3.83669 \times 10^6$$

Result:

$-1.08942\ldots - 1365.33\ldots\,i$

Polar coordinates:

$r = 1365.33$ (radius), $\theta = -90.0457°$ (angle)

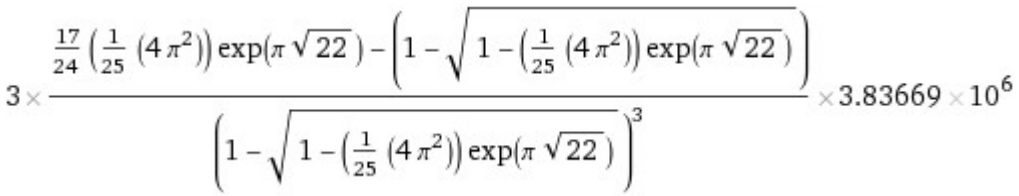
1365.33

where 1365.33 = 1/3 * 4096

Indeed:

3*((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3))) * 3.83669×10^6

Input interpretation:



Result:

$-3.26827\ldots - 4096.00\ldots\, i$

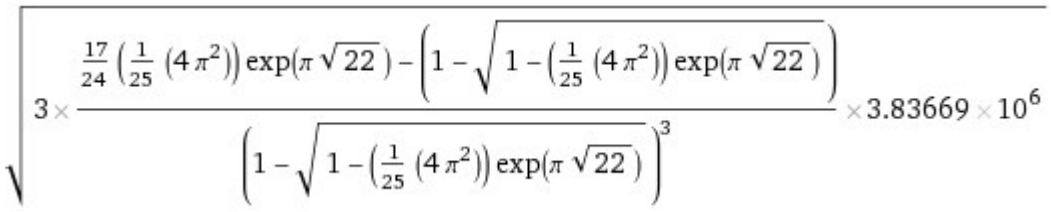
Polar coordinates:

$r = 4096.$ (radius), $\theta = -90.0457°$ (angle)

$4096 = 64^2$

sqrt[3*((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3))) * 3.83669×10^6]

Input interpretation:



Result:

$45.2368\ldots - 45.2729\ldots\, i$

Polar coordinates:

$r = 64.$ (radius), $\theta = -45.0229°$ (angle)

64

2(sqrt[3*((([17/24 * (4Pi^2)/25 * exp(Pi*sqrt22) – (1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))] / [(1-((1-(4Pi^2)/25 * exp(Pi*sqrt22))^0.5))]^3))) * 3.83669×10^6])-4

Input interpretation:

$$2\sqrt{\left(3\times\frac{\frac{17}{24}\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)-\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)}{\left(1-\sqrt{1-\left(\frac{1}{25}\left(4\pi^2\right)\right)\exp\left(\pi\sqrt{22}\right)}\right)^3}\times 3.83669\times 10^6\right)}-4$$

Result:

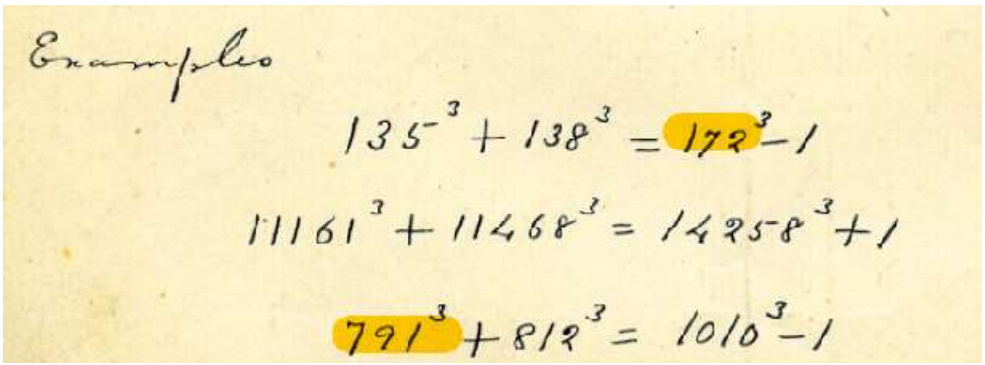
86.4735... –
90.5457... i

Polar coordinates:

$r = 125.205$ (radius), $\theta = -46.3178°$ (angle)

125.205 result very near to the Higgs boson mass 125.18 GeV

We would like to highlight once again, with regard the two values **172** and **791** we observe that:



Thence, we can to obtain these values performing the cubic roots of the Ramanujan's taxicab numbers above highlighted in yellow.

With regard the connection with the mass particles of Standard Model, we see that:

$c\bar{c}$ MESONS
(including possibly non- $q\bar{q}$ states)

X(4100)$^{\pm}$

X(4100)$^{\pm}$ MASS	4096±28 MeV

Citation: P.A. Zyla *et al.* (Particle Data Group), Prog. Theor. Exp. Phys. **2020**, 083C01 (2020)

$X(4100)^{\pm}$ $I^G(J^{PC}) = 1^-(?^{??})$

OMITTED FROM SUMMARY TABLE

Properties incompatible with a $q\bar{q}$ structure (exotic state). See the review on non-$q\bar{q}$ states.

Reported by AAIJ 18AN in the $\eta_c(1S)\pi^-$ invariant mass distribution in $B^0 \to \eta_c(1S)K^+\pi^-$ decays with a significance of 3.4σ. $J^P = 0^+$ or 1^- assignment consistent with data.

$X(4100)^{\pm}$ MASS

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
$4096 \pm 20^{+18}_{-22}$	AAIJ	18AN	LHCB	$B^0 \to \eta_c(1S)K^+\pi^-$

The mass of X(4100) meson is about 4096, practically equal to $64^2 = 4096$

Particle name	Particle symbol	Antiparticle symbol	Quark content	Rest mass (MeV/c^2)	I^G	J^{PC}	S	C	B'	Mean lifetime (s)	Commonly decays to (>5% of decays)
Phi meson[2]	$\phi(1020)$	Self	$s\bar{s}$	1,019.461 ± 0.020	0^-	1^{--}	0	0	0	$1.55 \pm 0.01 \times 10^{-22}$[f]	$K^+ + K^-$ or $K^0_S + K^0_L$ or $(\rho + \pi) / (\pi^+ + \pi^0 + \pi^-)$

The quark composition of the ϕ meson can be thought of as a mix between $s\bar{s}$, $u\bar{u}$, and $d\bar{d}$ states, but it is very nearly a pure $s\bar{s}$ state.[3] This can be shown by deconstructing the wave function of the ϕ into its component parts. We see that the ϕ and ω mesons are mixtures of the SU(3) wave functions as follows.

The mass of Phi(1020) meson is about 1019. Note that 1019 + 5 = 1024, where 5 is a Fibonacci number

Citation: P.A. Zyla et al. (Particle Data Group), Prog. Theor. Exp. Phys. 2020, 083C01 (2020)

H^0

$J = 0$

In the following H^0 refers to the signal that has been discovered in the Higgs searches. Whereas the observed signal is labeled as a spin 0 particle and is called a Higgs Boson, the detailed properties of H^0 and its role in the context of electroweak symmetry breaking need to be further clarified. These issues are addressed by the measurements listed below.

Concerning mass limits and cross section limits that have been obtained in the searches for neutral and charged Higgs bosons, see the sections "Searches for Neutral Higgs Bosons" and "Searches for Charged Higgs Bosons ($H^\pm$ and $H^{\pm\pm}$)", respectively.

H^0 MASS

VALUE (GeV)	DOCUMENT ID		TECN	COMMENT
125.10±0.14 OUR AVERAGE				
124.86±0.27	[1] AABOUD	18BM	ATLS	pp, 13 TeV, 36.1 fb^{-1}, $\gamma\gamma$, $ZZ^* \to 4\ell$
125.26±0.20±0.08	[2] SIRUNYAN	17AV	CMS	pp, 13 TeV, $ZZ^* \to 4\ell$
125.09±0.21±0.11	[1,3] AAD	15B	LHC	pp, 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
124.79±0.37	[4] AABOUD	18BM	ATLS	pp, 13 TeV, 36.1 fb^{-1}, $ZZ^* \to 4\ell$
124.93±0.40	[5] AABOUD	18BM	ATLS	pp, 13 TeV, 36.1 fb^{-1}, $\gamma\gamma$
124.97±0.24	[1,5] AABOUD	18BM	ATLS	pp, 7, 8, 13 TeV, $\gamma\gamma$, $ZZ^* \to 4\ell$
125.07±0.25±0.14	[3] AAD	15B	LHC	pp, 7, 8 TeV, $\gamma\gamma$
125.15±0.37±0.15	[3] AAD	15B	LHC	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
126.02±0.43±0.27	AAD	15B	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
124.51±0.52±0.04	AAD	15B	ATLS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
125.59±0.42±0.17	AAD	15B	CMS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
$125.02^{+0.26}_{-0.27}{}^{+0.14}_{-0.15}$	[7] KHACHATRY...	15AM	CMS	pp, 7, 8 TeV
125.36±0.37±0.18	[1,8] AAD	14W	ATLS	pp, 7, 8 TeV
125.98±0.42±0.28	[8] AAD	14W	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
124.51±0.52±0.06	[8] AAD	14W	ATLS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
125.6 ±0.4 ±0.2	[9] CHATRCHYAN	14AA	CMS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
122 ±7	[10] CHATRCHYAN	14K	CMS	pp, 7, 8 TeV, $\tau\tau$
124.70±0.31±0.15	[11] KHACHATRY...	14P	CMS	pp, 7, 8 TeV, $\gamma\gamma$
$125.5 \pm 0.2\ ^{+0.5}_{-0.6}$	[1,12] AAD	13AK	ATLS	pp, 7, 8 TeV
126.8 ±0.2 ±0.7	[12] AAD	13AK	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
$124.3\ ^{+0.6}_{-0.5}\ ^{+0.5}_{-0.3}$	[12] AAD	13AK	ATLS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
125.8 +0.4 +0.4	[1,13] CHATRCHYAN	13I	CMS	pp, 7, 8 TeV
126.2 ±0.6 ±0.2	[13] CHATRCHYAN	13J	CMS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
126.0 ±0.4 ±0.4	[1,14] AAD	12AI	ATLS	pp, 7, 8 TeV
125.3 ±0.4 ±0.5	[1,15] CHATRCHYAN	12N	CMS	pp, 7, 8 TeV

[1] Combined value from $\gamma\gamma$ and $ZZ^* \to 4\ell$ final states.

The Higgs boson mass is about 125, value equal to 128 – 3, where 3 is a Fibonacci number

Thence, we have:

128, 1024 and 4096, that are all multiples of 8 ($128 = 2 * 8^2$; $1024 = 2 * 8^3$; $4096 = 8^4$) and also connected with three particles of Standard Model, precisely the Higgs boson, Phi meson and $X(4100)^\pm$ meson

Observations

From:
https://www.scientificamerican.com/article/mathematics-ramanujan/?fbclid=IwAR2caRXrn_RpOSvJ1QxWsVLBcJ6KVgd_Af_hrmDYBNyU8mpSjRs1BDeremA

Ramanujan's statement concerned the deceptively simple concept of partitions—the different ways in which a whole number can be subdivided into smaller numbers. Ramanujan's original statement, in fact, stemmed from the observation of patterns, such as the fact that p(9) = 30, p(9 + 5) = 135, p(9 + 10) = 490, p(9 + 15) = 1,575 and so on are all divisible by 5. Note that here the n's come at intervals of five units.

Ramanujan posited that this pattern should go on forever, and that similar patterns exist when 5 is replaced by 7 or 11—there are infinite sequences of p(n) that are all divisible by 7 or 11, or, as mathematicians say, in which the "moduli" are 7 or 11.

Then, in nearly oracular tone Ramanujan went on: "There appear to be corresponding properties," he wrote in his 1919 paper, "in which the moduli are powers of 5, 7 or 11...and no simple properties for any moduli involving primes other than these three." (Primes are whole numbers that are only divisible by themselves or by 1.) Thus, for instance, there should be formulas for an infinity of n's separated by 5^3 = 125 units, saying that the corresponding p(n)'s should all be divisible by 125.
In the past methods developed to understand partitions have later been applied to physics problems such as the theory of the strong nuclear force or the entropy of black holes.

From Wikipedia

In particle physics, Yukawa's interaction or Yukawa coupling, named after Hideki Yukawa, is an interaction between a scalar field ϕ and a Dirac field ψ. The Yukawa interaction can be used to describe the nuclear force between nucleons (which are fermions), mediated by pions (which are pseudoscalar mesons). The Yukawa interaction is also used in the Standard Model to describe the coupling between the Higgs field and massless quark and lepton fields (i.e., the fundamental fermion particles). Through spontaneous symmetry breaking, these fermions acquire a mass proportional to the vacuum expectation value of the Higgs field.

Can be this the motivation that from the development of the Ramanujan's equations we obtain results 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 and practically equal to the rest mass of Pion meson 139.57 MeV

Note that:

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

Hence

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

so that

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

Hence

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

Thence:

$$64g_{22}^{-24} = 4096e^{-\pi\sqrt{22}} + \cdots$$

And

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

That are connected with 64, 128, 256, 512, 1024 and 4096 = 64^2

(Modular equations and approximations to π - S. Ramanujan - Quarterly Journal of Mathematics, XLV, 1914, 350 – 372)

All the results of the most important connections are signed in blue throughout the drafting of the paper. We highlight as in the development of the various equations we use always the constants π, ϕ, 1/ϕ, the Fibonacci and Lucas numbers, linked to the

golden ratio, that play a fundamental role in the development, and therefore, in the final results of the analyzed expressions.

In mathematics, the Fibonacci numbers, commonly denoted F_n, form a sequence, called the Fibonacci sequence, such that each number is the sum of the two preceding ones, starting from 0 and 1. Fibonacci numbers are strongly related to the golden ratio: Binet's formula expresses the nth Fibonacci number in terms of n and the golden ratio, and implies that the ratio of two consecutive Fibonacci numbers tends to the golden ratio as n increases.
Fibonacci numbers are also closely related to Lucas numbers ,in that the Fibonacci and Lucas numbers form a complementary pair of Lucas sequences

The beginning of the sequence is thus:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269, 2178309, 3524578, 5702887, 9227465, 14930352, 24157817, 39088169, 63245986, 102334155...

The Lucas numbers or Lucas series are an integer sequence named after the mathematician François Édouard Anatole Lucas (1842–91), who studied both that sequence and the closely related Fibonacci numbers. Lucas numbers and Fibonacci numbers form complementary instances of Lucas sequences.

The Lucas sequence has the same recursive relationship as the Fibonacci sequence, where each term is the sum of the two previous terms, but with different starting values. This produces a sequence where the ratios of successive terms approach the golden ratio, and in fact the terms themselves are roundings of integer powers of the golden ratio.[1] The sequence also has a variety of relationships with the Fibonacci numbers, like the fact that adding any two Fibonacci numbers two terms apart in the Fibonacci sequence results in the Lucas number in between.

The sequence of Lucas numbers is:

2, 1, 3, 4, 7, 11, 18, 29, 47, 76, 123, 199, 322, 521, 843, 1364, 2207, 3571, 5778, 9349, 15127, 24476, 39603, 64079, 103682, 167761, 271443, 439204, 710647, 1149851, 1860498, 3010349, 4870847, 7881196, 12752043, 20633239, 33385282, 54018521, 87403803……

All Fibonacci-like integer sequences appear in shifted form as a row of the Wythoff array; the Fibonacci sequence itself is the first row and the Lucas sequence is the

second row. Also like all Fibonacci-like integer sequences, the ratio between two consecutive Lucas numbers converges to the golden ratio.

A Lucas prime is a Lucas number that is prime. The first few Lucas primes are:

2, 3, 7, 11, 29, 47, 199, 521, 2207, 3571, 9349, 3010349, 54018521, 370248451, 6643838879, ... (sequence A005479 in the OEIS).

In geometry, a golden spiral is a logarithmic spiral whose growth factor is φ, the golden ratio.[1] That is, a golden spiral gets wider (or further from its origin) by a factor of φ for every quarter turn it makes. Approximate logarithmic spirals can occur in nature, for example the arms of spiral galaxies[3] - golden spirals are one special case of these logarithmic spirals

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

Furthermore, we obtain as results of our computations, always values very near to the Higgs boson mass 125.18 GeV and practically equals to the rest mass of Pion meson 139.57 MeV. In conclusion we obtain also many results that are very good approximations to the value of the golden ratio 1.618033988749... and to ζ(2) = $\frac{\pi^2}{6} = 1.644934 \ldots$

We note how the following three values: 137.508 (golden angle), 139.57 (mass of the Pion - meson Pi) and 125.18 (mass of the Higgs boson), are connected to each other. In fact, just add 2 to 137.508 to obtain a result very close to the mass of the Pion and subtract 12 to 137.508 to obtain a result that is also very close to the mass of the Higgs boson. We can therefore hypothesize that it is the golden angle (and the related golden ratio inherent in it) to be a fundamental ingredient both in the structures of the microcosm and in those of the macrocosm.

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