On the possible mathematical connections between some Ramanujan and Rademacher formulas, various parameters of Particle Physics, ϕ and $\zeta(2)$

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Abstract

In this paper we describe and analyze new possible mathematical connections between some Ramanujan and Rademacher formulas, various parameters of Particle Physics, ϕ and $\zeta(2$

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https://opc.mfo.de/detail?photo_id=10196&would_like_to_publish=1





https://blog.vedicmathsindia.org/srinivasa-ramanujan/

From

THE RAMANUJAN IDENTITIES UNDER MODULAR SUBSTITUTIONS
BY HANS RADEMACHER - Presented to the Society, February 22, 1941; received by the editors April 25, 1941.

We have that:

$$\sum_{l=0}^{\infty} p(5l+4)e^{2\pi i l\tau} = \frac{1}{5}e^{-19\pi i r/12}\sum_{\lambda=0}^{4}\frac{1}{\eta\left(\frac{\tau+24\lambda}{5}\right)}.$$

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1/5*exp((-19Pi)/12) sum((1/(eta(((tau+24x)/5)))))), x = 0..4

Input interpretation:

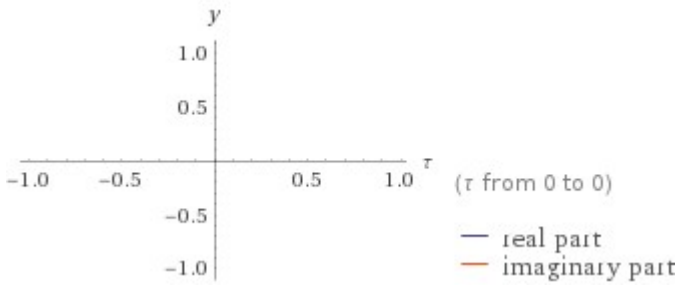
$$\frac{1}{5}\exp\left(\frac{1}{12}(-19\,\pi)\right)\sum_{x=0}^{4}\frac{1}{\eta\left(\frac{1}{5}(\tau+24\,x)\right)}$$

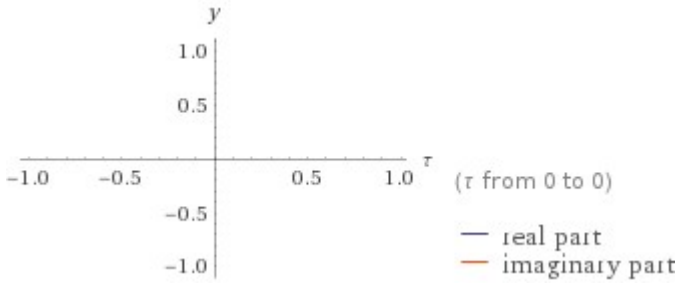
$\eta(\tau)$ is the Dedekind eta function

Result:

$$\frac{1}{5}\,e^{-(19\,\pi)/12}\left(\frac{1}{\eta\left(\frac{\tau+24}{5}\right)}+\frac{1}{\eta\left(\frac{\tau+48}{5}\right)}+\frac{1}{\eta\left(\frac{\tau+72}{5}\right)}+\frac{1}{\eta\left(\frac{\tau+96}{5}\right)}+\frac{1}{\eta\left(\frac{\tau}{5}\right)}\right)$$

Plots:





Alternate forms:

$$e^{-(19\pi)/12}\left(\frac{1}{5\,\eta\left(\frac{\tau+24}{5}\right)}+\frac{1}{5\,\eta\left(\frac{\tau+48}{5}\right)}+\frac{1}{5\,\eta\left(\frac{\tau+72}{5}\right)}+\frac{1}{5\,\eta\left(\frac{\tau+96}{5}\right)}+\frac{1}{5\,\eta\left(\frac{\tau}{5}\right)}\right)$$

$$\left(e^{-(19\pi)/12}\left(\eta\left(\frac{\tau}{5}\right)\eta\left(\frac{\tau+24}{5}\right)\eta\left(\frac{\tau+48}{5}\right)\eta\left(\frac{\tau+72}{5}\right)+\eta\left(\frac{\tau}{5}\right)\eta\left(\frac{\tau+24}{5}\right)\eta\left(\frac{\tau+96}{5}\right)\eta\left(\frac{\tau+72}{5}\right)+\eta\left(\frac{\tau}{5}\right)\eta\left(\frac{\tau+48}{5}\right)\eta\left(\frac{\tau+96}{5}\right)\eta\left(\frac{\tau+72}{5}\right)+\eta\left(\frac{\tau+24}{5}\right)\eta\left(\frac{\tau+48}{5}\right)\eta\left(\frac{\tau+96}{5}\right)\eta\left(\frac{\tau+72}{5}\right)+\eta\left(\frac{\tau}{5}\right)\eta\left(\frac{\tau+24}{5}\right)\eta\left(\frac{\tau+48}{5}\right)\eta\left(\frac{\tau+96}{5}\right)\right)\right)\Big/\left(5\,\eta\left(\frac{\tau}{5}\right)\eta\left(\frac{\tau+24}{5}\right)\eta\left(\frac{\tau+48}{5}\right)\eta\left(\frac{\tau+72}{5}\right)\eta\left(\frac{\tau+96}{5}\right)\right)$$

Expanded form:

$$\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{\tau+24}{5}\right)}+\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{\tau+48}{5}\right)}+\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{\tau+72}{5}\right)}+\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{\tau+96}{5}\right)}+\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{\tau}{5}\right)}$$

For $\tau = 1$ and $x = 2$

from:

$$\frac{1}{5}\exp\left(\frac{1}{12}(-19\pi)\right)\sum_{x=0}^{4}\frac{1}{\eta\left(\frac{1}{5}(\tau+24x)\right)}$$

we obtain:

1/5*exp((-19Pi)/12) ((1/(eta(((1+24*2)/5)))))

Input:

$$\frac{1}{5}\exp\left(\frac{1}{12}(-19\pi)\right)\times\frac{1}{\eta\left(\frac{1}{5}(1+24\times2)\right)}$$

$\eta(\tau)$ is the Dedekind eta function

Exact result:

$$\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{49}{5}\right)}$$

Series representations:

$$\frac{\exp\left(-\frac{19\pi}{12}\right)}{\eta\left(\frac{1}{5}(1+24\times2)\right)5}=\frac{1}{5}\exp\left(\left(-\frac{19}{12}-\frac{49\,i}{60}\right)\pi+\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{98/5\,i\,k\,n\,\pi}}{k}\right)$$

$$\frac{\exp\left(-\frac{19\pi}{12}\right)}{\eta\left(\frac{1}{5}(1+24\times2)\right)5}=\frac{1}{5}\,e^{-(19\pi)/12}\sum_{k=0}^{\infty}e^{98/5\,i\,(-1/24+k)\pi}\,p(k)$$

$$\frac{\exp\left(-\frac{19\pi}{12}\right)}{\eta\left(\frac{1}{5}(1+24\times2)\right)5}=-\frac{(-1)^{11/60+(19\,i)/12}}{5\sum_{k=-\infty}^{\infty}(-1)^k\,e^{49/5\,i\,k\,(-1+3k)\pi}}$$

Integral representation:

$$\frac{\exp\left(-\frac{19\pi}{12}\right)}{\eta\left(\frac{1}{5}(1+24\times 2)\right)5} = \frac{2\exp\left(-\frac{19\pi}{12}-\frac{i}{\pi}\int_i^{\frac{49}{5}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)\pi^{3/4}}{5\,\Gamma\left(\frac{1}{4}\right)}$$

From

$$\frac{e^{-(19\pi)/12}}{5\,\eta\left(\frac{49}{5}\right)}$$

we have that:

Input:

$$e^{-1/12\,(19\pi)}$$

Exact result:

$$e^{-(19\pi)/12}$$

Decimal approximation:

0.006914128389324398556664308962360854234878529497490272189...

0.0069141283…

Property:

$e^{-(19\pi)/12}$ is a transcendental number

Input:

$$5\,\eta\left(\frac{49}{5}\right)$$

$\eta(\tau)$ is the Dedekind eta function

Series representations:

$$5\,\eta\left(\frac{49}{5}\right) = 5\,(-1)^{49/60}\sum_{k=-\infty}^{\infty}(-1)^k\,e^{49/5\,i\,k\,(-1+3\,k)\,\pi}$$

$$5\,\eta\left(\frac{49}{5}\right) = 5\,(-1)^{49/60}\,e^{-\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}e^{98/5\,i\,k\,n\,\pi}/k}$$

$$5\,\eta\left(\frac{49}{5}\right) = 5\sum_{k=0}^{\infty}e^{49/60\,i\,(1+2\,k)^2\,\pi}\left(\frac{3}{1+2\,k}\right)$$

From

$$5\,\eta\left(\frac{49}{5}\right) = 5\,(-1)^{49/60}\sum_{k=-\infty}^{\infty}(-1)^k\,e^{49/5\,i\,k\,(-1+3\,k)\,\pi}$$

For k = 1:

5 (-1)^(49/60) (-1)^1 e^(49/5 i (-1 + 3) π)

Input:

$$5\,(-1)^{49/60}\,(-1)^1\,e^{49/5\,i\,(-1+3)\,\pi}$$

i is the imaginary unit

Exact result:

$$-5\,(-1)^{49/60}\,e^{-(2\,i\,\pi)/5}$$

Decimal approximation:

– 1.294095225512603811744494188120241641745344506599652569... –
4.829629131445341433748715998644486838169524195042022752... i

(using the principal branch of the logarithm for complex exponentiation)

Result:

– 1.294095225512603811744494188120241641745344506599652569... –
4.829629131445341433748715998644486838169524195042022752... i

Polar coordinates:

$r = 5.000000000000000000000000000000000000000000000000000000000$ (radius),
$\theta = -104.999999999999999999999999999999999999999999999999999999°$
(angle)

5 that is a Fibonacci number

(((e^(-(19 π)/12)))) / (((5 (-1)^(49/60) (-1)^1 e^(49/5 i (-1 + 3) π))))

Input:

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^1\,e^{49/5\,i\,(-1+3)\pi}}$$

i is the imaginary unit

Exact result:

$$\frac{1}{5}\,(-1)^{7/12+(19\,i)/12}$$

Decimal approximation:

$-0.000357901621488234148617387238932563701394703591278039 7... +$
$0.001335707035505374901133789153978383742220123698518993...\,i$

(using the principal branch of the logarithm for complex exponentiation)

Property:

$\frac{1}{5}\,(-1)^{7/12+(19\,i)/12}$ is a transcendental number

Polar coordinates:

$r \approx 0.00138283$ (radius), $\theta = 105°$ (angle)

0.00138283

Alternate form:

$$-\frac{\left(\sqrt{3}-1\right)e^{-(19\pi)/12}}{10\sqrt{2}}+\frac{i\left(1+\sqrt{3}\right)e^{-(19\pi)/12}}{10\sqrt{2}}$$

Alternative representations:

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = -\frac{e^{-(3420\,^\circ)/12}}{5\,(-1)^{49/60}\,e^{(17\,640\,^\circ\,i)/5}}$$

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = -\frac{e^{19/12\,i\log(-1)}}{5\,(-1)^{49/60}\,e^{-98/5\,i^2\log(-1)}}$$

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{\exp^{-\frac{1}{12}\,(19\pi)}(z)}{5\,(-1)^{49/60}\,(-1)^{1}\,\exp^{\frac{1}{5}\,i\,49\,(-1+3)\,\pi}(z)} \quad \text{for } z = 1$$

Series representations:

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{1}{5}\,(-1)^{11/60}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-1/15\,(95+1176\,i)\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}$$

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{1}{5}\,(-1)^{11/60}\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{-1/15\,(95+1176\,i)\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}$$

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{1}{5}\,(-1)^{11/60}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-1/60\,(95+1176\,i)\,\sum_{k=1}^{\infty}4^{-k}\left(-1+3^k\right)\zeta(1+k)}$$

Integral representations:

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{1}{5}\,(-1)^{11/60}\,e^{-\frac{1}{30}\,(95+1176\,i)\int_0^{\infty}\frac{1}{1+t^2}\,dt}$$

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{1}{5}\,(-1)^{11/60}\,e^{-1/15\,(95+1176\,i)\int_0^{1}\sqrt{1-t^2}\,dt}$$

$$\frac{e^{-1/12\,(19\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}} = \frac{1}{5}\,(-1)^{11/60}\,e^{-1/30\,(95+1176\,i)\int_0^{\infty}\sin(t)/t\,dt}$$

1/((((((e^(-(19 π)/12)))) / (((5 (-1)^(49/60) (-1)^1 e^(49/5 i (-1 + 3) π)))))))-5i

Input:

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^1\,e^{49/5\,i\,(-1+3)\,\pi}}} - 5\,i$$

i is the imaginary unit

Exact result:

$$-5\,i + 5\,(-1)^{-7/12-(19\,i)/12}$$

Decimal approximation:

$-187.166791335654379729470484827053832996431650385895927 15\ldots - 703.515974754304473435698121846966667773579319154930285 70\ldots\,i$

(using the principal branch of the logarithm for complex exponentiation)

Property:

$-5\,i + 5\,(-1)^{-7/12-(19\,i)/12}$ is a transcendental number

Alternate forms:

$$5\left(-i + (-1)^{-7/12-(19\,i)/12}\right)$$

$$-5\,i - 5\,(-1)^{5/12-(19\,i)/12}$$

$$-5\,(-1)^{5/12-(19\,i)/12}\left(1 - i\,(-1)^{7/12+(19\,i)/12}\right)$$

Alternative representations:

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^1\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\,i + \frac{1}{-\frac{e^{-(3420\,^\circ)/12}}{5\,(-1)^{49/60}\,e^{(17640\,^\circ\,i)/5}}}$$

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^1\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\,i + \frac{1}{-\frac{e^{19/12\,i\log(-1)}}{5\,(-1)^{49/60}\,e^{-98/5\,i^2\log(-1)}}}$$

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = \frac{1}{\frac{\exp^{-\frac{1}{12}\,(19\,\pi)}(z)}{5\,(-1)^{49/60}\,(-1)^{1}\,\exp^{\frac{1}{5}\,i\,49\,(-1+3)\,\pi}(z)}} - i\,5 \quad \text{for } z = 1$$

Series representations:

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\left(i + (-1)^{49/60}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{1/15\,(95+1176\,i)\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}\right)$$

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\left(i + (-1)^{49/60}\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{1/15\,(95+1176\,i)\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}\right)$$

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\left(i + (-1)^{49/60}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{1/60\,(95+1176\,i)\,\sum_{k=1}^{\infty}4^{-k}\left(-1+3^k\right)\zeta(1+k)}\right)$$

Integral representations:

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\,(-1)^{49/60}\,e^{1/30\,(95+1176\,i)\,\int_0^{\infty}1/(1+t^2)\,dt} - 5\,i$$

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\,(-1)^{49/60}\,e^{1/15\,(95+1176\,i)\,\int_0^{1}\sqrt{1-t^2}\,dt} - 5\,i$$

$$\frac{1}{\frac{e^{-1/12\,(19\,\pi)}}{5\,(-1)^{49/60}\,(-1)^{1}\,e^{1/5\,i\,49\,(-1+3)\,\pi}}} - i\,5 = -5\,(-1)^{49/60}\,e^{1/30\,(95+1176\,i)\,\int_0^{\infty}\sin(t)/t\,dt} - 5\,i$$

(-187.166791335654379729- 703.5159747543044734356i)

Input interpretation:

$-187.166791335654379729 + i \times (-703.5159747543044734356)$

i is the imaginary unit

Result:

$-187.166791335654379729\ldots - 703.5159747543044734356\ldots\, i$

Polar coordinates:

$r = 727.987729644795288292$ (radius), $\theta = -104.89814906111642874 12°$ (angle)

727.987729644795288292 ≈ 728 = $9^3 - 1$ (Ramanujan taxicab number)

(-187.166791335654379729- 703.5159747543044734356i)-76i+19i+(1/golden ratio)i

Input interpretation:

$(-187.166791335654379729 + i \times (-703.5159747543044734356)) - 76\,i + 19\,i + \frac{1}{\phi}\,i$

i is the imaginary unit

ϕ is the golden ratio

Result:

$-187.166791335654379729\ldots - 759.8979407655545785874\ldots\, i$

Polar coordinates:

$r = 782.608643038533457282$ (radius), $\theta = -103.8368255619336914332°$ (angle)

782.608643038533457282 result practically equal to the rest mass of Omega meson 782.65

Alternative representations:

$$(-187.166791335654379729000 - i\,703.515974754304473435600000) - i\,76 + 19\,i + \frac{i}{\phi} = -187.166791335654379729000 - 760.515974754304473435600000\,i + \frac{i}{2\sin(54^\circ)}$$

$$(-187.166791335654379729000 - i\,703.515974754304473435600000) - i\,76 + 19\,i + \frac{i}{\phi} = -187.166791335654379729000 - 760.515974754304473435600000\,i + -\frac{i}{2\cos(216^\circ)}$$

$$(-187.166791335654379729000 - i\,703.515974754304473435600000) - i\,76 + 19\,i + \frac{i}{\phi} = -187.166791335654379729000 - 760.515974754304473435600000\,i + -\frac{i}{2\sin(666^\circ)}$$

From

$$(2.4) \qquad \sum_{\lambda=0}^{6} \eta\left(\frac{\tau + 24\lambda}{7}\right)^{-1} = 7^2 \frac{\eta(7\tau)^3}{\eta(\tau)^4} + 7^3 \frac{\eta(7\tau)^7}{\eta(\tau)^8}\,.$$

we obtain:

sum(((eta(((tau+24x)/7)^-1)))), x = 0..6

Sum:

$$\sum_{x=0}^{6} \eta\left(\frac{1}{\frac{1}{7}(24x+1)}\right) = \eta\left(\frac{7}{145}\right) + \eta\left(\frac{7}{121}\right) + \eta\left(\frac{7}{97}\right) + \eta\left(\frac{7}{73}\right) + \eta\left(\frac{1}{7}\right) + \eta\left(\frac{7}{25}\right) + \eta(7)$$

$\eta(\tau)$ is the Dedekind eta function

$\eta(7/145) + \eta(7/121) + \eta(7/97) + \eta(7/73) + \eta(1/7) + \eta(7/25) + \eta(7)$

Input:

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7)$$

$\eta(\tau)$ is the Dedekind eta function

Series representations:

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7) = \sum_{k=0}^{\infty} e^{(7\,i\,(1+2\,k)^2\,\pi)/1740}$$
$$\left(1+e^{(14\,i\,(1+2\,k)^2\,\pi)/17545}+e^{(28\,i\,(1+2\,k)^2\,\pi)/14065}+e^{(42\,i\,(1+2\,k)^2\,\pi)/10585}+\right.$$
$$\left.e^{(8\,i\,(1+2\,k)^2\,\pi)/1015}+e^{14/725\,i\,(1+2\,k)^2\,\pi}+e^{84/145\,i\,(1+2\,k)^2\,\pi}\right)\left(\frac{3}{1+2\,k}\right)$$

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7) =$$
$$\sum_{k=1}^{\infty} e^{(7\,i\,k^2\,\pi)/1740}\left(1+e^{(14\,i\,k^2\,\pi)/17545}+e^{(28\,i\,k^2\,\pi)/14065}+\right.$$
$$\left.e^{(42\,i\,k^2\,\pi)/10585}+e^{(8\,i\,k^2\,\pi)/1015}+e^{14/725\,i\,k^2\,\pi}+e^{84/145\,i\,k^2\,\pi}\right)$$
$$\left(\delta_{1,k \bmod 12}-\delta_{5,k \bmod 12}-\delta_{7,k \bmod 12}+\delta_{11,k \bmod 12}\right)$$

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7) =$$
$$\sum_{k=-\infty}^{\infty}\left((-1)^k\,e^{(7\,i\,\pi)/1740+7/145\,i\,k\,(-1+3\,k)\,\pi}+\right.$$
$$(-1)^k\,e^{(7\,i\,\pi)/1452+7/121\,i\,k\,(-1+3\,k)\,\pi}+(-1)^k\,e^{(7\,i\,\pi)/1164+7/97\,i\,k\,(-1+3\,k)\,\pi}+$$
$$(-1)^k\,e^{(7\,i\,\pi)/876+7/73\,i\,k\,(-1+3\,k)\,\pi}+(-1)^k\,e^{(i\,\pi)/84+1/7\,i\,k\,(-1+3\,k)\,\pi}+$$
$$\left.(-1)^k\,e^{(7\,i\,\pi)/300+7/25\,i\,k\,(-1+3\,k)\,\pi}+(-1)^k\,e^{(7\,i\,\pi)/12+7\,i\,k\,(-1+3\,k)\,\pi}\right)$$

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7) =$$
$$\frac{1}{\sum_{k=0}^{\infty} e^{14/145\,i\,(-1/24+k)\,\pi}\,p(k)}+\frac{1}{\sum_{k=0}^{\infty} e^{14/121\,i\,(-1/24+k)\,\pi}\,p(k)}+$$
$$\frac{1}{\sum_{k=0}^{\infty} e^{14/97\,i\,(-1/24+k)\,\pi}\,p(k)}+\frac{1}{\sum_{k=0}^{\infty} e^{14/73\,i\,(-1/24+k)\,\pi}\,p(k)}+$$
$$\frac{1}{\sum_{k=0}^{\infty} e^{2/7\,i\,(-1/24+k)\,\pi}\,p(k)}+\frac{1}{\sum_{k=0}^{\infty} e^{14/25\,i\,(-1/24+k)\,\pi}\,p(k)}+\frac{1}{\sum_{k=0}^{\infty} e^{14\,i\,(-1/24+k)\,\pi}\,p(k)}$$

Integral representation:

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7)=$$
$$\frac{1}{2\,\pi^{3/4}}\left(\exp\left(\frac{i}{\pi}\int_i^{\frac{7}{145}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+\right.$$
$$\exp\left(\frac{i}{\pi}\int_i^{\frac{7}{121}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+$$
$$\exp\left(\frac{i}{\pi}\int_i^{\frac{7}{97}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+$$
$$\exp\left(\frac{i}{\pi}\int_i^{\frac{7}{73}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+$$
$$\exp\left(\frac{i}{\pi}\int_i^{\frac{1}{7}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+$$
$$\exp\left(\frac{i}{\pi}\int_i^{\frac{7}{25}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+$$
$$\left.\exp\left(\frac{i}{\pi}\int_i^{7}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)\right)\Gamma\left(\frac{1}{4}\right)$$

$\zeta(u;g_2,g_3)$ is the Weierstrass zeta function

$\Gamma(x)$ is the gamma function

From

$$\eta\left(\frac{7}{145}\right)+\eta\left(\frac{7}{121}\right)+\eta\left(\frac{7}{97}\right)+\eta\left(\frac{7}{73}\right)+\eta\left(\frac{1}{7}\right)+\eta\left(\frac{7}{25}\right)+\eta(7)=\sum_{k=0}^{\infty}e^{(7\,i\,(1+2\,k)^2\,\pi)/1740}$$
$$\left(1+e^{(14\,i\,(1+2\,k)^2\,\pi)/17545}+e^{(28\,i\,(1+2\,k)^2\,\pi)/14065}+e^{(42\,i\,(1+2\,k)^2\,\pi)/10585}+\right.$$
$$\left.e^{(8\,i\,(1+2\,k)^2\,\pi)/1015}+e^{14/725\,i\,(1+2\,k)^2\,\pi}+e^{84/145\,i\,(1+2\,k)^2\,\pi}\right)\left(\frac{3}{1+2\,k}\right)$$

For τ = 1 and x = 2 , k = 1, we obtain:

e^((7 i (1 + 2)^2 π)/1740)

Input:

$$e^{(7\,i\,(1+2)^2\,\pi)/1740}$$

i is the imaginary unit

Exact result:

$$e^{(21\,i\,\pi)/580}$$

Decimal approximation:

0.99353774571268913868771188980222477418557547097171251801... +
0.11350219312483726195901249773897523951983818762837584106... i

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r = 1$ (radius), $\theta \approx 6.51724°$ (angle)

1

Alternate forms:

$$(-1)^{21/580}$$

$$\cos\left(\frac{21\,\pi}{580}\right) + i\sin\left(\frac{21\,\pi}{580}\right)$$

Alternative representations:

$$e^{(7(i\,(1+2)^2\,\pi))/1740} = e^{(11340\,°\,i)/1740}$$

$$e^{(7(i\,(1+2)^2\,\pi))/1740} = e^{-(63\,i^2\,\log(-1))/1740}$$

$$e^{(7(i\,(1+2)^2\,\pi))/1740} = e^{\left(126\,i^2\,\log\left(\frac{1-i}{1+i}\right)\right)/1740}$$

Series representations:

$$e^{(7(i\,(1+2)^2\,\pi))/1740} = e^{21/145\,i\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}$$

$$e^{(7(i\,(1+2)^2\,\pi))/1740} = \left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{(21\,i\,\pi)/580}$$

$$e^{(7(i(1+2)^2\pi))/1740} = \left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{(21i\pi)/580}$$

Integral representations:

$$e^{(7(i(1+2)^2\pi))/1740} = e^{(21i)/145\int_0^1\sqrt{1-t^2}\,dt}$$

$$e^{(7(i(1+2)^2\pi))/1740} = e^{(21i)/290\int_0^1 1/\sqrt{1-t^2}\,dt}$$

$$e^{(7(i(1+2)^2\pi))/1740} = e^{(21i)/290\int_0^\infty 1/(1+t^2)\,dt}$$

(1 + e^((14 i (1 + 2)^2 π)/17545) + e^((28 i (1 + 2)^2 π)/14065) +e^((42 i (1 + 2)^2 π)/10585) + e^((8 i (1 + 2)^2 π)/1015) + e^(14/725 i (1 + 2)^2 π) + e^(84/145 i (1 + 2)^2 π)) (3/(1 + 2))

Input:

$$\left(1+e^{(14i(1+2)^2\pi)/17545}+e^{(28i(1+2)^2\pi)/14065}+e^{(42i(1+2)^2\pi)/10585}+e^{(8i(1+2)^2\pi)/1015}+e^{14/725\,i(1+2)^2\pi}+e^{84/145\,i(1+2)^2\pi}\right)\times\frac{3}{1+2}$$

i is the imaginary unit

Exact result:

$$1+e^{(126i\pi)/17545}+e^{(252i\pi)/14065}+e^{(378i\pi)/10585}+e^{(72i\pi)/1015}+e^{(126i\pi)/725}+e^{-(114i\pi)/145}$$

Decimal approximation:

5.038965974939157105969313451801588743812639468998982493 5... +
0.308765842369985143100281200125547570466536135829386761 17... i

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r \approx 5.04842$ (radius), $\theta \approx 3.50645°$ (angle)

5.04842

e^((21 i π)/580) * (((1 + e^((126 i π)/17545) + e^((252 i π)/14065) + e^((378 i π)/10585) + e^((72 i π)/1015) + e^((126 i π)/725) + e^(-(114 i π)/145))))

Input:

$$e^{1/580\,(21\,i\,\pi)}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10\,585}+e^{(72\,i\,\pi)/1015}+e^{1/725\,(126\,i\,\pi)}+e^{-1/145\,(114\,i\,\pi)}\right)$$

i is the imaginary unit

Exact result:

$$e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10\,585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-(114\,i\,\pi)/145}\right)$$

Decimal approximation:

4.971357295192961870354314288961507220963917068518327950 2... +
0.878704208218382645529287050000102166175662009760344655 51... i

(using the principal branch of the logarithm for complex exponentiation)

Polar coordinates:

$r \approx 5.04842$ (radius), $\theta \approx 10.0237°$ (angle)

5.04842

Alternate forms:

$$(-1)^{21/580}+(-1)^{21/484}+(-1)^{21/388}+(-1)^{21/292}+(-1)^{3/28}+(-1)^{21/100}-\sqrt[4]{-1}$$

$$e^{(21\,i\,\pi)/580}+e^{(21\,i\,\pi)/484}+e^{(21\,i\,\pi)/388}+e^{(21\,i\,\pi)/292}+e^{(3\,i\,\pi)/28}+e^{(21\,i\,\pi)/100}+e^{-(3\,i\,\pi)/4}$$

$$-\sin\left(\frac{21\pi}{580}\right)\left(\sin\left(\frac{126\pi}{17545}\right)+\sin\left(\frac{252\pi}{14065}\right)+\sin\left(\frac{378\pi}{10585}\right)+\sin\left(\frac{72\pi}{1015}\right)+\sin\left(\frac{126\pi}{725}\right)-\sin\left(\frac{31\pi}{145}\right)\right)+\cos\left(\frac{21\pi}{580}\right)\left(1+\cos\left(\frac{126\pi}{17545}\right)+\cos\left(\frac{252\pi}{14065}\right)+\cos\left(\frac{378\pi}{10585}\right)+\cos\left(\frac{72\pi}{1015}\right)+\cos\left(\frac{126\pi}{725}\right)-\cos\left(\frac{31\pi}{145}\right)\right)+i\left(\sin\left(\frac{21\pi}{580}\right)\left(1+\cos\left(\frac{126\pi}{17545}\right)+\cos\left(\frac{252\pi}{14065}\right)+\cos\left(\frac{378\pi}{10585}\right)+\cos\left(\frac{72\pi}{1015}\right)+\cos\left(\frac{126\pi}{725}\right)-\cos\left(\frac{31\pi}{145}\right)\right)+\left(\sin\left(\frac{126\pi}{17545}\right)+\sin\left(\frac{252\pi}{14065}\right)+\sin\left(\frac{378\pi}{10585}\right)+\sin\left(\frac{72\pi}{1015}\right)+\sin\left(\frac{126\pi}{725}\right)-\sin\left(\frac{31\pi}{145}\right)\right)\cos\left(\frac{21\pi}{580}\right)\right)$$

Alternative representations:

$$e^{(21(i\pi))/580}\left(1+e^{(126(i\pi))/17545}+e^{(252(i\pi))/14065}+e^{(378(i\pi))/10585}+e^{(72(i\pi))/1015}+e^{(126(i\pi))/725}+e^{-1/145(114i\pi)}\right)=e^{-21/580\,i^2\log(-1)}\left(1+e^{114/145\,i^2\log(-1)}+e^{-126/725\,i^2\log(-1)}+e^{-(72i^2\log(-1))/1015}+e^{-(378i^2\log(-1))/10585}+e^{-(252i^2\log(-1))/14065}+e^{-(126i^2\log(-1))/17545}\right)$$

$$e^{(21(i\pi))/580}\left(1+e^{(126(i\pi))/17545}+e^{(252(i\pi))/14065}+e^{(378(i\pi))/10585}+e^{(72(i\pi))/1015}+e^{(126(i\pi))/725}+e^{-1/145(114i\pi)}\right)=e^{(3780^\circ i)/580}\left(1+e^{-(20520^\circ i)/145}+e^{(22680^\circ i)/725}+e^{(12960^\circ i)/1015}+e^{(68040^\circ i)/10585}+e^{(45360^\circ i)/14065}+e^{(22680^\circ i)/17545}\right)$$

$$e^{(21(i\pi))/580}\left(1+e^{(126(i\pi))/17545}+e^{(252(i\pi))/14065}+e^{(378(i\pi))/10585}+e^{(72(i\pi))/1015}+e^{(126(i\pi))/725}+e^{-1/145(114i\pi)}\right)=e^{42/580\,i^2\log((1-i)/(1+i))}\left(1+e^{-228/145\,i^2\log((1-i)/(1+i))}+e^{252/725\,i^2\log((1-i)/(1+i))}+e^{\left(144i^2\log\left(\frac{1-i}{1+i}\right)\right)/1015}+e^{\left(756i^2\log\left(\frac{1-i}{1+i}\right)\right)/10585}+e^{\left(504i^2\log\left(\frac{1-i}{1+i}\right)\right)/14065}+e^{\left(252i^2\log\left(\frac{1-i}{1+i}\right)\right)/17545}\right)$$

we have also:

11/10^3+1/Pi[e^((21 i π)/580) * (((1 + e^((126 i π)/17545) + e^((252 i π)/14065) + e^((378 i π)/10585) + e^((72 i π)/1015) + e^((126 i π)/725) + e^(-(114 i π)/145))))]

Input:

$$\frac{11}{10^3}+\frac{1}{\pi}\left(e^{1/580\,(21\,i\,\pi)}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{1/725\,(126\,i\,\pi)}+e^{-1/145\,(114\,i\,\pi)}\right)\right)$$

i is the imaginary unit

Exact result:

$$\frac{11}{1000}+\frac{1}{\pi}e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-(114\,i\,\pi)/145}\right)$$

Decimal approximation:

1.59343217481182913669252261475911763296742303464100027 52... +
0.27970023650721127951432462029744001566540862210785438831... i

(using the principal branch of the logarithm for complex exponentiation)

Property:

$$\frac{11}{1000}+\frac{1}{\pi}e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-(114\,i\,\pi)/145}\right)$$ is a transcendental number

Polar coordinates:

$r \approx 1.61779$ (radius), $\theta \approx 9.95588°$ (angle)

1.61779 result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$\frac{11}{1000}+\frac{(-1)^{21/580}+(-1)^{21/484}+(-1)^{21/388}+(-1)^{21/292}+(-1)^{3/28}+(-1)^{21/100}-\sqrt[4]{-1}}{\pi}$$

$$\frac{1}{1000\,\pi}\left(11\,\pi+1000\,e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-(114\,i\,\pi)/145}\right)\right)$$

$$\frac{11}{1000}+e^{(21\,i\,\pi)/580}\left(\frac{1}{\pi}+\frac{e^{(126\,i\,\pi)/17545}}{\pi}+\frac{e^{(252\,i\,\pi)/14065}}{\pi}+\frac{e^{(378\,i\,\pi)/10585}}{\pi}+\frac{e^{(72\,i\,\pi)/1015}}{\pi}+\frac{e^{(126\,i\,\pi)/725}}{\pi}+\frac{e^{-(114\,i\,\pi)/145}}{\pi}\right)$$

Expanded form:

$$\frac{11}{1000}+\frac{e^{(21\,i\,\pi)/580}}{\pi}+\frac{e^{(21\,i\,\pi)/484}}{\pi}+\frac{e^{(21\,i\,\pi)/388}}{\pi}+\frac{e^{(21\,i\,\pi)/292}}{\pi}+\frac{e^{(3\,i\,\pi)/28}}{\pi}+\frac{e^{(21\,i\,\pi)/100}}{\pi}+\frac{e^{-(3\,i\,\pi)/4}}{\pi}$$

Alternative representations:

$$\frac{11}{10^3}+\frac{1}{\pi}e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-1/145\,(114\,i\,\pi)}\right)=-\frac{1}{i\log(-1)}$$

$$e^{-21/580\,i^2\log(-1)}\left(1+e^{114/145\,i^2\log(-1)}+e^{-126/725\,i^2\log(-1)}+e^{-(72\,i^2\log(-1))/1015}+e^{-(378\,i^2\log(-1))/10585}+e^{-(252\,i^2\log(-1))/14065}+e^{-(126\,i^2\log(-1))/17545}\right)+\frac{11}{10^3}$$

$$\frac{11}{10^3}+\frac{1}{\pi}e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-1/145\,(114\,i\,\pi)}\right)=\frac{1}{180^\circ}e^{(3780^\circ\,i)/580}\left(1+e^{-(20520^\circ\,i)/145}+e^{(22680^\circ\,i)/725}+e^{(12960^\circ\,i)/1015}+e^{(68040^\circ\,i)/10585}+e^{(45360^\circ\,i)/14065}+e^{(22680^\circ\,i)/17545}\right)+\frac{11}{10^3}$$

$$\frac{11}{10^3}+\frac{1}{\pi}e^{(21\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-1/145\,(114\,i\,\pi)}\right)=\frac{11}{10^3}+\frac{1}{\cos^{-1}(-1)}\exp^{\frac{21}{580}\,i\cos^{-1}(-1)}(z)\left(1+\exp^{\frac{126\,i\cos^{-1}(-1)}{17545}}(z)+\exp^{\frac{252\,i\cos^{-1}(-1)}{14065}}(z)+\exp^{\frac{378\,i\cos^{-1}(-1)}{10585}}(z)+\exp^{\frac{72\,i\cos^{-1}(-1)}{1015}}(z)+\exp^{\frac{126}{725}\,i\cos^{-1}(-1)}(z)+\exp^{-\frac{1}{145}\left(114\,i\cos^{-1}(-1)\right)}(z)\right)\quad\text{for } z=1$$

And again:

-8+27*1/2*(((e^((21 i π)/580) * ((1 + e^((126 i π)/17545) + e^((252 i π)/14065) + e^((378 i π)/10585) + e^((72 i π)/1015) + e^((126 i π)/725) + e^(-(114 i π)/145))))))^3-3/2

Input:

$$-8+27\times\frac{1}{2}\left(e^{1/580\,(21\,i\,\pi)}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10\,585}+e^{(72\,i\,\pi)/1015}+e^{1/725\,(126\,i\,\pi)}+e^{-1/145\,(114\,i\,\pi)}\right)\right)^3-\frac{3}{2}$$

i is the imaginary unit

Exact result:

$$-\frac{19}{2}+\frac{27}{2}\,e^{(63\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17\,545}+e^{(252\,i\,\pi)/14\,065}+e^{(378\,i\,\pi)/10\,585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-(114\,i\,\pi)/145}\right)^3$$

Decimal approximation:

1493.706239520096166973188614050769099677896228944483114 81… +
870.364686922568090641692101899626196929241936318013863727… i

(using the principal branch of the logarithm for complex exponentiation)

Input interpretation:

1493.706239520096166973188614050769099677896228944483114 81 +
870.364686922568090641692101899626196929241936318013863727 i

i is the imaginary unit

Result:

1493.706239520096166973188614050769099677896228944483114 81… +
870.364686922568090641692101899626196929241936318013863727… i

Polar coordinates:

$r = 1728.7836817320687765710504001917738614626265900464643401 9$ (radius)

, $\theta = 30.228841530928129414768697443228030127569951096171322835 1°$

(angle)

1728.7836817…

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)

-Pi+(((e^((21 i π)/580) * ((1 + e^((126 i π)/17545) + e^((252 i π)/14065) + e^((378 i π)/10585) + e^((72 i π)/1015) + e^((126 i π)/725) + e^(-(114 i π)/145))))))^3

Input:

$$-\pi + \left(e^{1/580\,(21\,i\,\pi)}\left(1 + e^{(126\,i\,\pi)/17545} + e^{(252\,i\,\pi)/14065} + e^{(378\,i\,\pi)/10585} + e^{(72\,i\,\pi)/1015} + e^{1/725\,(126\,i\,\pi)} + e^{-1/145\,(114\,i\,\pi)}\right)\right)^3$$

i is the imaginary unit

Exact result:

$$-\pi + e^{(63\,i\,\pi)/580}\left(1 + e^{(126\,i\,\pi)/17545} + e^{(252\,i\,\pi)/14065} + e^{(378\,i\,\pi)/10585} + e^{(72\,i\,\pi)/1015} + e^{(126\,i\,\pi)/725} + e^{-(114\,i\,\pi)/145}\right)^3$$

Decimal approximation:

108.207017681232145055847624324184874869721069781697717498... +
64.471458290560599306792007548120459031795698986519545461 3... i

(using the principal branch of the logarithm for complex exponentiation)

Property:

$$e^{(63\,i\,\pi)/580}\left(1 + e^{(126\,i\,\pi)/17545} + e^{(252\,i\,\pi)/14065} + e^{(378\,i\,\pi)/10585} + e^{(72\,i\,\pi)/1015} + e^{(126\,i\,\pi)/725} + e^{-(114\,i\,\pi)/145}\right)^3 - \pi \text{ is a transcendental number}$$

Input interpretation:

108.207017681232145055847624324184874869721069781697717498 +
64.471458290560599306792007548120459031795698986519545461 3 i

i is the imaginary unit

Result:

108.207017681232145055847624324184874869721069781697717498... +
64.471458290560599306792007548120459031795698986519545461 3... i

Polar coordinates:

$r = 125.957642124557020066804385743634686714158004286837529117$ (radius)
, $\theta = 30.787156805711101554161997940976161155314381599868470 3487°$
(angle)

125.95764212… result very near to the Higgs boson mass 125.18 GeV

(((e^((21 i π)/580) * ((1 + e^((126 i π)/17545) + e^((252 i π)/14065) + e^((378 i π)/10585) + e^((72 i π)/1015) + e^((126 i π)/725) + e^(-(114 i π)/145))))))^3+11i

Input:

$$\left(e^{1/580\,(21\,i\,\pi)}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10585}+e^{(72\,i\,\pi)/1015}+e^{1/725\,(126\,i\,\pi)}+e^{-1/145\,(114\,i\,\pi)}\right)\right)^3+11\,i$$

i is the imaginary unit

Exact result:

$$11\,i+e^{(63\,i\,\pi)/580}\left(1+e^{(126\,i\,\pi)/17545}+e^{(252\,i\,\pi)/14065}+e^{(378\,i\,\pi)/10\,585}+e^{(72\,i\,\pi)/1015}+e^{(126\,i\,\pi)/725}+e^{-(114\,i\,\pi)/145}\right)^3$$

Decimal approximation:

111.348610334821938294310267707464377753918239181072823319... +
75.471458290560599306792007548120459031795698986519545461 3... i

(using the principal branch of the logarithm for complex exponentiation)

Input interpretation:

111.348610334821938294310267707464377753918239181072823319 +
75.471458290560599306792007548120459031795698986519545461 3 i

i is the imaginary unit

Result:

111.348610334821938294310267707464377753918239181072823319... +
75.471458290560599306792007548120459031795698986519545461 3... i

Polar coordinates:

$r = 134.515627493610730967744146064478313057789569394281047938$ (radius)

, $\theta = 34.129197461384320201104779699323759915483996030430868262 4°$ (angle)

134.51562749361…. result practically equal to the rest mass of Pion meson 134.9766 MeV

Now, we have that:

5. The identity (2.4) can be treated in the same manner. We give only a few highlights. Replacing τ by $-\tau^{-1}$ in (2.4) we have

$$(5.1) \qquad \sum_{\lambda=0}^{6} \eta\left(\frac{24\lambda\tau - 1}{7\tau}\right)^{-1} = 7^2 \frac{\eta\left(-\frac{7}{\tau}\right)^3}{\eta\left(-\frac{1}{\tau}\right)^4} + 7^3 \frac{\eta\left(-\frac{7}{\tau}\right)^7}{\eta\left(-\frac{1}{\tau}\right)^8}.$$

Calling the left-hand member L_7 we rewrite it as

$$(5.2) \qquad L_7 = \eta\left(-\frac{1}{7\tau}\right)^{-1} + \sum_{\lambda=1}^{6} \eta\left(\frac{24\lambda\,\frac{\tau + 96\lambda'}{7} + b_\lambda}{7\,\frac{\tau + 96\lambda'}{7} - 96\lambda'}\right)^{-1}$$

with

$$(5.21) \qquad \lambda\lambda' \equiv -1 \pmod 7,$$

and

$$(5.22) \qquad b_\lambda = -(24 \cdot 96\lambda\lambda' + 1)/7.$$

For -1(mod 7) = 6; $\lambda = 2$; $\lambda' = 3$

-(24*96*6+1)/7 = -1975 = b_λ; $\tau = 1$

From

$$L_7 = \eta\left(-\frac{1}{7\tau}\right)^{-1} + \sum_{\lambda=1}^{6} \eta\left(\frac{24\lambda\,\dfrac{\tau+96\lambda'}{7}+b_\lambda}{7\,\dfrac{\tau+96\lambda'}{7}-96\lambda'}\right)^{-1}$$

we obtain:

eta(-1/7)^(-1) + eta[(((24*2*((1+96*3)/7)-1975)))/(((7*((1+96*3)/7)-96*3)))]^-1

Input:

$$\frac{1}{\eta\left(-\frac{1}{7}\right)} + \frac{1}{\eta\left(\frac{24\times 2\left(\frac{1}{7}(1+96\times 3)\right)-1975}{7\left(\frac{1}{7}(1+96\times 3)\right)-96\times 3}\right)}$$

$\eta(\tau)$ is the Dedekind eta function

Exact result:

$$\frac{1}{\eta\left(-\frac{1}{7}\right)} + \frac{1}{\eta\left(\frac{47}{7}\right)}$$

Alternate form:

$$\frac{\eta\left(-\frac{1}{7}\right)+\eta\left(\frac{47}{7}\right)}{\eta\left(-\frac{1}{7}\right)\eta\left(\frac{47}{7}\right)}$$

Series representations:

$$\frac{1}{\eta\left(-\frac{1}{7}\right)} + \frac{1}{\eta\left(\frac{\frac{1}{7}(24\times 2)(1+96\times 3)-1975}{\frac{7}{7}(1+96\times 3)-96\times 3}\right)} = \sum_{k=0}^{\infty} e^{-2/7\,i\left(-1/24+k\right)\pi}\left(1+e^{4/7\,i\left(-1+24\,k\right)\pi}\right)p(k)$$

$$\frac{1}{\eta\left(-\frac{1}{7}\right)}+\frac{1}{\eta\left(\frac{\frac{1}{7}(24\times 2)(1+96\times 3)-1975}{\frac{7}{7}(1+96\times 3)-96\times 3}\right)}=$$
$$-\sqrt[84]{-1}\left(-e^{\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}e^{-2/7\,i\,k\,n\,\pi}/k}+(-1)^{3/7}\,e^{\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}e^{94/7\,i\,k\,n\,\pi}/k}\right)$$

$$\frac{1}{\eta\left(-\frac{1}{7}\right)}+\frac{1}{\eta\left(\frac{\frac{1}{7}(24\times 2)(1+96\times 3)-1975}{\frac{7}{7}(1+96\times 3)-96\times 3}\right)}=$$
$$-\frac{(-1)^{37/84}\left(\sum_{k=-\infty}^{\infty}e^{-1/7\,i\,k\,(-8+3\,k)\,\pi}+(-1)^{4/7}\sum_{k=-\infty}^{\infty}(-1)^{k}\,e^{47/7\,i\,k\,(-1+3\,k)\,\pi}\right)}{\left(\sum_{k=-\infty}^{\infty}e^{-1/7\,i\,k\,(-8+3\,k)\,\pi}\right)\sum_{k=-\infty}^{\infty}(-1)^{k}\,e^{47/7\,i\,k\,(-1+3\,k)\,\pi}}$$

Integral representation:

$$\frac{1}{\eta\left(-\frac{1}{7}\right)}+\frac{1}{\eta\left(\frac{\frac{1}{7}(24\times 2)(1+96\times 3)-1975}{\frac{7}{7}(1+96\times 3)-96\times 3}\right)}=\frac{1}{\Gamma\left(\frac{1}{4}\right)}$$
$$2\exp\left(-\frac{i}{\pi}\int_{i}^{-\frac{1}{7}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt-\frac{i}{\pi}\int_{i}^{\frac{47}{7}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)\left(\exp\left(\frac{i}{\pi}\int_{i}^{-\frac{1}{7}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)+\exp\left(\frac{i}{\pi}\int_{i}^{\frac{47}{7}}\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]\,dt\right)\right)\pi^{3/4}$$

$\zeta(u;g_2,g_3)$ is the Weierstrass zeta function

$\Gamma(x)$ is the gamma function

From

$$\frac{1}{\eta\left(-\frac{1}{7}\right)}+\frac{1}{\eta\left(\frac{\frac{1}{7}(24\times 2)(1+96\times 3)-1975}{\frac{7}{7}(1+96\times 3)-96\times 3}\right)}=$$
$$-\sqrt[84]{-1}\left(-e^{\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}e^{-2/7\,i\,k\,n\,\pi}/k}+(-1)^{3/7}\,e^{\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}e^{94/7\,i\,k\,n\,\pi}/k}\right)$$

For n and k = 1, we obtain:

-(-1)^(1/84) (-e^(e^(-2/7 i π)) + (-1)^(3/7) e^(e^(94/7 i π)))

Input:

$$-\sqrt[84]{-1}\left(-e^{e^{-2/7\,i\,\pi}}+(-1)^{3/7}\,e^{e^{94/7\,i\,\pi}}\right)$$

i is the imaginary unit

Exact result:

$$-\sqrt[84]{-1}\left((-1)^{3/7}\,e^{e^{-(4\,i\,\pi)/7}}-e^{e^{-(2\,i\,\pi)/7}}\right)$$

Decimal approximation:

0.637457173526896279970420626543671125396634657579563315 87... − 1.582182456679004392932573746515746876068696013749217244 6... i

(using the principal branch of the logarithm for complex exponentiation)

Input interpretation:

$$0.637457173526896279970420626543671125396634657579563315 87 + i\times(-1.582182456679004392932573746515746876068696013749217244 6)$$

i is the imaginary unit

Result:

0.637457173526896279970420626543671125396634657579563315 87... − 1.582182456679004392932573746515746876068696013749217244 6... i

Polar coordinates:

$r = 1.705770492857614525811946932878000762156027883927440426 5$ (radius),

$\theta = -68.055623389436865994018696989183609633085167581163601114°$ (angle)

1.7057704928576……

Alternate forms:

$$\sqrt[84]{-1}\;e^{-(-1)^{5/7}}-(-1)^{37/84}\,e^{-(-1)^{3/7}}$$

$$-\sqrt[84]{-1}\left((-1)^{3/7}\,e^{-(-1)^{3/7}}-e^{-(-1)^{5/7}}\right)$$

$$-\sqrt[84]{-1}\;e^{-(-1)^{3/7}-(-1)^{5/7}}\left((-1)^{3/7}\,e^{(-1)^{5/7}}-e^{(-1)^{3/7}}\right)$$

Expanded form:

$$\sqrt[84]{-1}\; e^{e^{-(2\,i\,\pi)/7}} - (-1)^{37/84}\; e^{e^{-(4\,i\,\pi)/7}}$$

Alternative representations:

$$-\sqrt[84]{-1}\left(-e^{e^{1/7\,(i\,\pi)\,(-2)}} + (-1)^{3/7}\; e^{e^{1/7\,(i\,\pi)\,94}}\right) = -\sqrt[84]{-1}\left((-1)^{3/7}\; e^{e^{-94/7\,i^2\,\log(-1)}} - e^{e^{2/7\,i^2\,\log(-1)}}\right)$$

$$-\sqrt[84]{-1}\left(-e^{e^{1/7\,(i\,\pi)\,(-2)}} + (-1)^{3/7}\; e^{e^{1/7\,(i\,\pi)\,94}}\right) = -\sqrt[84]{-1}\left(-e^{e^{-(360^\circ\,i)/7}} + (-1)^{3/7}\; e^{e^{(16\,920^\circ\,i)/7}}\right)$$

$$-\sqrt[84]{-1}\left(-e^{e^{1/7\,(i\,\pi)\,(-2)}} + (-1)^{3/7}\; e^{e^{1/7\,(i\,\pi)\,94}}\right) = -\sqrt[84]{-1}\left(-e^{e^{-4/7\,i^2\,\log((1-i)/(1+i))}} + (-1)^{3/7}\; e^{e^{188/7\,i^2\,\log((1-i)/(1+i))}}\right)$$

Series representations:

$$-\sqrt[84]{-1}\left(-e^{e^{1/7\,(i\,\pi)\,(-2)}} + (-1)^{3/7}\; e^{e^{1/7\,(i\,\pi)\,94}}\right) = -\sqrt[84]{-1}\left(-\exp\left(e^{-8/7\,i\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}\right) + (-1)^{3/7}\exp\left(e^{-16/7\,i\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}\right)\right)$$

$$-\sqrt[84]{-1}\left(-e^{e^{1/7\,(i\,\pi)\,(-2)}} + (-1)^{3/7}\; e^{e^{1/7\,(i\,\pi)\,94}}\right) = -\sqrt[84]{-1}\left(-\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\left(\sum_{k=0}^{\infty}1/k!\right)^{-(2\,i\,\pi)/7}} + (-1)^{3/7}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\left(\sum_{k=0}^{\infty}1/k!\right)^{-(4\,i\,\pi)/7}}\right)$$

$$-\sqrt[84]{-1}\left(-e^{e^{1/7\,(i\,\pi)\,(-2)}} + (-1)^{3/7}\; e^{e^{1/7\,(i\,\pi)\,94}}\right) = -\sqrt[84]{-1}\left(-\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\left(1\,/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{-(2\,i\,\pi)/7}} + (-1)^{3/7}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\left(1\,/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{-(4\,i\,\pi)/7}}\right)$$

Integral representations:

$$-\sqrt[84]{-1}\left(-e^{e^{1/7(i\pi)(-2)}}+(-1)^{3/7}\,e^{e^{1/7(i\pi)94}}\right)=$$
$$-\sqrt[84]{-1}\left(-e^{e^{-(4i)/7\int_0^1 1/\sqrt{1-t^2}\,dt}}+(-1)^{3/7}\,e^{e^{-(8i)/7\int_0^1 1/\sqrt{1-t^2}\,dt}}\right)$$

$$-\sqrt[84]{-1}\left(-e^{e^{1/7(i\pi)(-2)}}+(-1)^{3/7}\,e^{e^{1/7(i\pi)94}}\right)=$$
$$-\sqrt[84]{-1}\left(-e^{e^{-(4i)/7\int_0^\infty 1/(1+t^2)\,dt}}+(-1)^{3/7}\,e^{e^{-(8i)/7\int_0^\infty 1/(1+t^2)\,dt}}\right)$$

$$-\sqrt[84]{-1}\left(-e^{e^{1/7(i\pi)(-2)}}+(-1)^{3/7}\,e^{e^{1/7(i\pi)94}}\right)=$$
$$-\sqrt[84]{-1}\left(-e^{e^{-(8i)/7\int_0^1 \sqrt{1-t^2}\,dt}}+(-1)^{3/7}\,e^{e^{-(16i)/7\int_0^1 \sqrt{1-t^2}\,dt}}\right)$$

From which:

10^3(((-(-1)^(1/84) (-e^(e^(-2/7 i π)) + (-1)^(3/7) e^(e^(94/7 i π))))))-24i

Input:

$$10^3\left(-\sqrt[84]{-1}\left(-e^{e^{-2/7\,i\pi}}+(-1)^{3/7}\,e^{e^{94/7\,i\pi}}\right)\right)-24\,i$$

i is the imaginary unit

Exact result:

$$-24\,i-1000\sqrt[84]{-1}\left((-1)^{3/7}\,e^{e^{-(4\,i\,\pi)/7}}-e^{e^{-(2\,i\,\pi)/7}}\right)$$

Decimal approximation:

637.457173526896279970420626543671125396634657579563315877... − 1606.182456679004392932573746515746876068696013749217244 63... i

(using the principal branch of the logarithm for complex exponentiation)

Input interpretation:

637.457173526896279970420626543671125396634657579563315877 + $i\times$(−1606.182456679004392932573746515746876068696013749217244 63)

i is the imaginary unit

Result:

637.457173526896279970420626543671125396634657579563315877... –
1606.182456679004392932573746515746876068696013749217244 63... i

Polar coordinates:

$r = 1728.0548984983959064676227009192852039008219684902729 2933$ (radius)

, $\theta = -68.353001298685503701388063834951524653618683305294 0514103°$ (angle)

1728.0548984….

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)

Alternate forms:

$$-8\left(3\,i+125\,(-1)^{37/84}\,e^{-(-1)^{3/7}}-125\,\sqrt[84]{-1}\,e^{-(-1)^{5/7}}\right)$$

$$-8\left(3\,i-125\,\sqrt[84]{-1}\,e^{e^{-(2\,i\,\pi)/7}}+125\,(-1)^{37/84}\,e^{e^{-(4\,i\,\pi)/7}}\right)$$

$$-1000\,\sqrt[84]{-1}\,\left((-1)^{3/7}\,e^{-(-1)^{3/7}}-e^{-(-1)^{5/7}}\right)+-24\,i$$

Expanded form:

$$-24\,i+1000\,\sqrt[84]{-1}\,e^{e^{-(2\,i\,\pi)/7}}-1000\,(-1)^{37/84}\,e^{e^{-(4\,i\,\pi)/7}}$$

Alternative representations:

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-24\,i-\sqrt[84]{-1}\;10^3\left((-1)^{3/7}\,e^{e^{-94/7\,i^2\,\log(-1)}}-e^{e^{2/7\,i^2\,\log(-1)}}\right)$$

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-24\,i-\sqrt[84]{-1}\;10^3\left(-e^{e^{-(360^\circ\,i)/7}}+(-1)^{3/7}\,e^{e^{(16\,920^\circ\,i)/7}}\right)$$

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-24\,i-\sqrt[84]{-1}\;10^3\left(-e^{e^{-4/7\,i^2\,\log((1-i)/(1+i))}}+(-1)^{3/7}\,e^{e^{188/7\,i^2\,\log((1-i)/(1+i))}}\right)$$

Series representations:

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-8\left(3\,i-125\,\sqrt[84]{-1}\,\exp\left(e^{-8/7\,i\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}\right)+\right.$$
$$\left.125\,(-1)^{37/84}\,\exp\left(e^{-16/7\,i\,\sum_{k=0}^{\infty}(-1)^k/(1+2\,k)}\right)\right)$$

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-8\left(3\,i-125\,\sqrt[84]{-1}\,\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\left(\sum_{k=0}^{\infty}1/k!\right)^{-(2\,i\,\pi)/7}}+125\,(-1)^{37/84}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\left(\sum_{k=0}^{\infty}1/k!\right)^{-(4\,i\,\pi)/7}}\right)$$

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-8\left(3\,i-125\,\sqrt[84]{-1}\,\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{-(2\,i\,\pi)/7}}+\right.$$
$$\left.125\,(-1)^{37/84}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{-(4\,i\,\pi)/7}}\right)$$

Integral representations:

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-8\left(3\,i-125\,\sqrt[84]{-1}\;e^{e^{-(4\,i)/7\int_0^1 1/\sqrt{1-t^2}\,dt}}+125\,(-1)^{37/84}\,e^{e^{-(8\,i)/7\int_0^1 1/\sqrt{1-t^2}\,dt}}\right)$$

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-8\left(3\,i-125\,\sqrt[84]{-1}\;e^{e^{-(4\,i)/7}\int_0^\infty 1/\left(1+t^2\right)dt}+125\,(-1)^{37/84}\;e^{e^{-(8\,i)/7}\int_0^\infty 1/\left(1+t^2\right)dt}\right)$$

$$10^3\,(-1)\left(\sqrt[84]{-1}\,\left(-e^{e^{-(2\,i\,\pi)/7}}+(-1)^{3/7}\,e^{e^{(94\,i\,\pi)/7}}\right)\right)-i\,24=$$
$$-8\left(3\,i-125\,\sqrt[84]{-1}\;e^{e^{-(8\,i)/7}\int_0^1\sqrt{1-t^2}\,dt}+125\,(-1)^{37/84}\;e^{e^{-(16\,i)/7}\int_0^1\sqrt{1-t^2}\,dt}\right)$$

From which:

(637.45717352689627997- 1606.18245667900439293i)^1/15

Input interpretation:

$$\sqrt[15]{637.45717352689627997+i\times(-1606.18245667900439293)}$$

i is the imaginary unit

Result:

1.6385593529250825372 16... –
0.13059390929901835562 44... i

Polar coordinates:

$r = 1.643755310928078925076$ (radius), $\theta = -4.5568667532457002468°$ (angle)

$1.643755310928078925076 \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Now, we have that:

From

$$5^{-1/2}\eta\left(\frac{\tau}{5}\right)\eta(5\tau)^{-1} - \sum_{\lambda=1}^{4}\left(\frac{\lambda}{5}\right)\eta\left(\frac{\tau}{5}\right)\eta\left(\frac{\tau+24\lambda}{5}\right)^{-1}$$

$$(7.1) \qquad = 5^{-1i2}\left[\frac{\eta\left(\frac{\tau}{5}\right)}{\eta(\tau)}\right]^{6}.$$

we obtain:

5^(-1*2*i)*(eta(1/5)/eta(1))^6

Input:

$$5^{-2\,i}\left(\frac{\eta\left(\frac{1}{5}\right)}{\eta(1)}\right)^6$$

$\eta(\tau)$ is the Dedekind eta function

i is the imaginary unit

Exact result:

$$\frac{5^{-2\,i}\,\eta\left(\frac{1}{5}\right)^6}{\eta(1)^6}$$

Series representations:

$$5^{-i\,2}\left(\frac{\eta\left(\frac{1}{5}\right)}{\eta(1)}\right)^6 = -(-1)^{3/5}\,5^{-2\,i}\,\exp\left(-6\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2/5\,i\,k\,n\,\pi}}{k} + 6\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2\,i\,k\,n\,\pi}}{k}\right)$$

$$5^{-i\,2}\left(\frac{\eta\left(\frac{1}{5}\right)}{\eta(1)}\right)^6 = \frac{5^{3-2\,i}\left(\sum_{k=0}^{\infty}(-1)^k\,e^{-5\,i\,k\,(1+k)\,\pi}\,(1+2\,k)\right)^2}{\left(\sum_{k=0}^{\infty}e^{-i\,k^2\,\pi}\,(1+2\,k)\right)^2}$$

$$5^{-i\,2}\left(\frac{\eta\left(\frac{1}{5}\right)}{\eta(1)}\right)^6 = -\frac{(-1)^{3/5}\,5^{-2\,i}\left(\sum_{k=-\infty}^{\infty}e^{1/5\,i\,k\,(4+3\,k)\,\pi}\right)^6}{\left(\sum_{k=-\infty}^{\infty}e^{3\,i\,k^2\,\pi}\right)^6}$$

Integral representation:

$$5^{-i\,2}\left(\frac{\eta\left(\frac{1}{5}\right)}{\eta(1)}\right)^6 = 5^{-2\,i}\exp\left(\frac{6\,i}{\pi}\int_i^{\frac{1}{5}}\left(\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]-\left(\frac{15}{13}+\frac{10\,i}{13}\right)\text{WeierstrassZeta}\left[1,\text{WeierstrassInvariants}\left[\left\{1,\left(\frac{3}{13}+\frac{2\,i}{13}\right)((2-2\,i)+5\,t)\right\}\right]\right]\right)dt\right)$$

From

$$5^{-i\,2}\left(\frac{\eta\left(\frac{1}{5}\right)}{\eta(1)}\right)^6 = -(-1)^{3/5}\,5^{-2\,i}\exp\left(-6\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2/5\,i\,k\,n\,\pi}}{k}+6\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{2\,i\,k\,n\,\pi}}{k}\right)$$

For k and n equal to 1, we obtain:

-(-1)^(3/5) 5^(-2 i) exp(-6 * e^(2/5 i π) + 6 * e^(2 i π))

Input:

$$-(-1)^{3/5}\times 5^{-2\,i}\exp\left(-6\,e^{2/5\,i\,\pi}+6\,e^{2\,i\,\pi}\right)$$

i is the imaginary unit

Exact result:

$$-(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}$$

Decimal approximation:

$$-45.918177296111213373862463735042546363356114163661355481\ldots + 43.387980512471030148485906103122119527160995242530232358\ldots\,i$$

(using the principal branch of the logarithm for complex exponentiation)

Input interpretation:

$$-45.918177296111213373862463735042546363356114163661355481 + 43.387980512471030148485906103122119527160995242530232358\,i$$

i is the imaginary unit

Result:

$-45.918177296111213373862463735042546363356114163661355481\ldots +$
$43.387980512471030148485906103122119527160995242530232358\ldots\ i$

Polar coordinates:

$r = 63.174329115137179891116942843697173335801802875270207933$ (radius),
$\theta = 136.622853685596771879937630807203460432774282847120202009°$
(angle)

63.174329115…

Property:

$-(-1)^{3/5}\ 5^{-2\,i}\ e^{6-6\,e^{(2\,i\,\pi)/5}}$ is a transcendental number

Alternate forms:

$$-(-1)^{3/5}\ 5^{-2\,i}\ e^{6-6(-1)^{2/5}}$$

$$-(-1)^{3/5}\ 5^{-2\,i}\ e^{3/2\left(5-\sqrt{5}\ -i\sqrt{2\left(5+\sqrt{5}\right)}\right)}$$

$$\frac{1}{4}\,e^{-3/2\left(\sqrt{5}\ -5\right)}\left(\left(\sqrt{5}\ -1\right)\cos\left(3\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\ +\log(25)\right)-\sqrt{2\left(5+\sqrt{5}\right)}\ \sin\left(3\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\ +\log(25)\right)\right)-\frac{1}{4}\,i\,e^{-3/2\left(\sqrt{5}\ -5\right)}\left(\left(\sqrt{5}\ -1\right)\sin\left(3\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\ +\log(25)\right)+\sqrt{2\left(5+\sqrt{5}\right)}\ \cos\left(3\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\ +\log(25)\right)\right)$$

Alternative representations:

$$\left(5^{-2\,i}\ \exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=\left(5^{-2\,i}\ \exp\left(-6\,z^{(2\,i\,\pi)/5}+6\,z^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}\quad \text{for } z=e$$

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=\left(5^{-2\,i}\,\exp\left(-6\,w^{a}+6\,w^{a}\right)\right)(-1)\,(-1)^{3/5}$$
$$\text{for}\left(a=\frac{2\,i\,\pi}{5\log(w)}\ \text{and}\ a=\frac{2\,i\,\pi}{\log(w)}\right)$$

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=$$
$$-\exp\left(6\left(1+\frac{2}{-1+\coth(i\,\pi)}\right)-6\left(1+\frac{2}{-1+\coth\left(\frac{i\,\pi}{5}\right)}\right)\right)(-1)^{3/5}\,5^{-2\,i}$$

Series representations:

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=$$
$$-(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{8/5\,i\,\sum_{k=0}^{\infty}(-1)^{k}/(1+2\,k)}\right)$$

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=-(-1)^{3/5}\,5^{-2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6-6\left(\sum_{k=0}^{\infty}1/k!\right)(2\,i\,\pi)/5}$$

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=$$
$$-(-1)^{3/5}\,5^{-2\,i}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}}\right)^{6-6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}\right)\right)(2\,i\,\pi)/5}$$

Integral representations:

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=-(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(8\,i)/5}\int_{0}^{1}\sqrt{1-t^{2}}\,dt}$$

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=-(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5\int_{0}^{1}1\Big/\sqrt{1-t^{2}}\,dt}\right)$$

$$\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}=-(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5\int_{0}^{\infty}1/(1+t^{2})\,dt}\right)$$

From which:

2*[(((-(-1)^(3/5) 5^(-2 i) exp(-6 * e^(2/5 i π) + 6 * e^(2 i π)))))+1i]-3i

Input:

$$2\left(-(-1)^{3/5}\times 5^{-2\,i}\exp\left(-6\,e^{2/5\,i\,\pi}+6\,e^{2\,i\,\pi}\right)+1\,i\right)-3\,i$$

i is the imaginary unit

Exact result:

$$-3\,i+2\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}\right)$$

Decimal approximation:

$$-91.836354592222426747724927470085092726712228327322710962\ldots+85.775961024942060296971812206244239054321990485060464717\ldots\,i$$

(using the principal branch of the logarithm for complex exponentiation)

Alternate forms:

$$-i-2\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6(-1)^{2/5}}$$

$$-5^{-2\,i}\,e^{-6(-1)^{2/5}}\left(2\,(-1)^{3/5}\,e^{6}+i\,5^{2\,i}\,e^{6(-1)^{2/5}}\right)$$

$$-3\,i+2\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{3/2\left(5-\sqrt{5}-i\sqrt{2\left(5+\sqrt{5}\right)}\right)}\right)$$

Expanded form:

$$-i-2\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}$$

Alternative representations:

$$2\left(\left(5^{-2\,i}\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=2\left(\left(5^{-2\,i}\exp\left(-6\,z^{(2\,i\,\pi)/5}+6\,z^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3\quad\text{for } z=e$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,w^{a}+6\,w^{a}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3$$
$$\text{for}\left(a=\frac{2\,i\,\pi}{5\log(w)}\ \text{and}\ a=\frac{2\,i\,\pi}{\log(w)}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$-3\,i+2\left(i-\exp\left(6\left(1+\frac{2}{-1+\coth(i\,\pi)}\right)-6\left(1+\frac{2}{-1+\coth\left(\frac{i\,\pi}{5}\right)}\right)\right)(-1)^{3/5}\,5^{-2\,i}\right)$$

Series representations:

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$-i-2\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{8/5\,i\,\sum_{k=0}^{\infty}(-1)^{k}/(1+2\,k)}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$-5^{-2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-6\left(\sum_{k=0}^{\infty}1/k!\right)/(2\,i\,\pi)/5}\left(2\,(-1)^{3/5}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6}+i\,5^{2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6\left(\sum_{k=0}^{\infty}1/k!\right)/(2\,i\,\pi)/5}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$-5^{-2\,i}\left(2\,(-1)^{3/5}+i\,5^{2\,i}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}}\right)^{-6+6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}\right)\right)^{(2\,i\,\pi)/5}}\right)$$
$$\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}}\right)^{6-6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}\right)\right)^{(2\,i\,\pi)/5}}$$

Integral representations:

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$-i-2\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(8\,i)/5}\int_{0}^{1}\sqrt{1-t^{2}}\,dt}$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)-i\,3=$$
$$-i-2\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5\int_{0}^{1}1\Big/\sqrt{1-t^{2}}\,dt}\right)$$

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

Input interpretation:

$$-91.836354592222426747724927470085092726712228327322710962+$$
$$85.775961024942060296971812206244239054321990485060464717\,i$$

i is the imaginary unit

Result:

$$-91.836354592222426747724927470085092726712228327322710962\ldots+$$
$$85.775961024942060296971812206244239054321990485060464717\ldots\,i$$

Polar coordinates:

$r = 125.663962672441587274016938327001157176200361209616193 26$ (radius),

$\theta = 136.954258112498598518927022692320929337154546440574169764°$ (angle)

125.66396267… result very near to the Higgs boson mass 125.18 GeV

2*[(((-(-1)^(3/5) 5^(-2 i) exp(-6 * e^(2/5 i π) + 6 * e^(2 i π)))))+1i]+11i

Input:

$$2\left(-(-1)^{3/5}\times 5^{-2\,i}\exp\left(-6\,e^{2/5\,i\,\pi}+6\,e^{2\,i\,\pi}\right)+1\,i\right)+11\,i$$

i is the imaginary unit

Exact result:

$$11\,i+2\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}\right)$$

Decimal approximation:

$$-91.836354592222426747724927470085092726712228327322710962\ldots+$$
$$99.775961024942060296971812206244239054321990485060464717\ldots\,i$$

(using the principal branch of the logarithm for complex exponentiation)

Alternate forms:

$$13\,i-2\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,(-1)^{2/5}}$$

$$-5^{-2\,i}\,e^{-6\,(-1)^{2/5}}\left(2\,(-1)^{3/5}\,e^{6}-13\,i\,5^{2\,i}\,e^{6\,(-1)^{2/5}}\right)$$

$$11\,i+2\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{3/2\left(5-\sqrt{5}\,-i\,\sqrt{2\left(5+\sqrt{5}\right)}\right)}\right)$$

Expanded form:

$$13\,i-2\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}$$

Alternative representations:

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,z^{(2\,i\,\pi)/5}+6\,z^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i\ \text{ for } z=e$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,w^{a}+6\,w^{a}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i$$
$$\text{for}\left(a=\frac{2\,i\,\pi}{5\log(w)}\ \text{and}\ a=\frac{2\,i\,\pi}{\log(w)}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$11\,i+2\left(i-\exp\left(6\left(1+\frac{2}{-1+\coth(i\,\pi)}\right)-6\left(1+\frac{2}{-1+\coth\left(\frac{i\,\pi}{5}\right)}\right)\right)(-1)^{3/5}\,5^{-2\,i}\right)$$

Series representations:

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$13\,i-2\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{8/5\,i\,\sum_{k=0}^{\infty}(-1)^{k}/(1+2\,k)}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$-5^{-2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-6\left(\sum_{k=0}^{\infty}1/k!\right)^{(2\,i\,\pi)/5}}\left(2\,(-1)^{3/5}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6}-13\,i\,5^{2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6\left(\sum_{k=0}^{\infty}1/k!\right)^{(2\,i\,\pi)/5}}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$-5^{-2\,i}\left(2\,(-1)^{3/5}-13\,i\,5^{2\,i}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{-6+6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{(2\,i\,\pi)/5}}\right)$$
$$\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{6-6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{(2\,i\,\pi)/5}}$$

Integral representations:

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$13\,i-2\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(8\,i)/5}\int_0^1\sqrt{1-t^2}\,dt}$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$13\,i-2\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5\int_0^1 1\Big/\sqrt{1-t^2}\,dt}\right)$$

$$2\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+11\,i=$$
$$13\,i-2\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5\int_0^\infty 1/(1+t^2)\,dt}\right)$$

Input interpretation:

$$-91.836354592222426747724927470085092726712228327322710962+99.775961024942060296971812206244239054321990485060464717\,i$$

i is the imaginary unit

Result:

$$-91.836354592222426747724927470085092726712228327322710962\ldots+99.775961024942060296971812206244239054321990485060464717\ldots\,i$$

Polar coordinates:

$r = 135.606631191985483528744141583200763258270422191147048 10$ (radius),

$\theta = 132.627261798587732131458288274549154066391908580716997242°$ (angle)

135.60663119… result very near to the rest mass of Pion meson 134.9766 MeV

27*[(((-(-1)^(3/5) 5^(-2 i) exp(-6 * e^(2/5 i π) + 6 * e^(2 i π)))))+1i]+1i

Input:

$$27\left(-(-1)^{3/5}\times 5^{-2\,i}\,\exp\left(-6\,e^{2/5\,i\,\pi}+6\,e^{2\,i\,\pi}\right)+1\,i\right)+1\,i$$

i is the imaginary unit

Exact result:

$$i+27\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}\right)$$

Decimal approximation:

$$-1239.790786995002761094286520846148751810615082418856597 9\ldots+1199.475473836717814009119464784297227233346871548316273 6\ldots\,i$$

(using the principal branch of the logarithm for complex exponentiation)

Alternate forms:

$$28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,(-1)^{2/5}}$$

$$-5^{-2\,i}\,e^{-6\,(-1)^{2/5}}\left(27\,(-1)^{3/5}\,e^{6}-28\,i\,5^{2\,i}\,e^{6\,(-1)^{2/5}}\right)$$

$$i+27\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{3/2\left(5-\sqrt{5}-i\sqrt{2\left(5+\sqrt{5}\right)}\right)}\right)$$

Expanded form:

$$28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}$$

Alternative representations:

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=27\left(\left(5^{-2\,i}\,\exp\left(-6\,z^{(2\,i\,\pi)/5}+6\,z^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i\quad\text{for } z=e$$

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,w^{a}+6\,w^{a}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i$$
$$\text{for}\left(a=\frac{2\,i\,\pi}{5\log(w)}\ \text{and}\ a=\frac{2\,i\,\pi}{\log(w)}\right)$$

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$i+27\left(i-\exp\left(6\left(1+\frac{2}{-1+\coth(i\,\pi)}\right)-6\left(1+\frac{2}{-1+\coth\left(\frac{i\,\pi}{5}\right)}\right)\right)(-1)^{3/5}\,5^{-2\,i}\right)$$

Series representations:

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{8/5\,i\,\sum_{k=0}^{\infty}(-1)^{k}/(1+2\,k)}\right)$$

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$-5^{-2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{-6\left(\sum_{k=0}^{\infty}1/k!\right)^{(2\,i\,\pi)/5}}\left(27\,(-1)^{3/5}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6}-28\,i\,5^{2\,i}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{6\left(\sum_{k=0}^{\infty}1/k!\right)^{(2\,i\,\pi)/5}}\right)$$

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$-5^{-2\,i}\left(27\,(-1)^{3/5}-28\,i\,5^{2\,i}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}}\right)^{-6+6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}\right)\right)^{(2\,i\,\pi)/5}}\right)$$
$$\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}}\right)^{6-6\left(1\Big/\left(\sum_{k=0}^{\infty}\frac{(-1)^{k}}{k!}\right)\right)^{(2\,i\,\pi)/5}}$$

Integral representations:

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(8\,i)/5}\int_{0}^{1}\sqrt{1-t^{2}}\,dt}$$

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5\int_{0}^{1}1\Big/\sqrt{1-t^{2}}\,dt}\right)$$

$$27\left(\left(5^{-2\,i}\,\exp\left(-6\,e^{(2\,i\,\pi)/5}+6\,e^{2\,i\,\pi}\right)\right)(-1)\,(-1)^{3/5}+1\,i\right)+1\,i=$$
$$28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,\exp\left(6-6\,e^{(4\,i)/5}\int_0^{\infty}1/\left(1+t^2\right)dt\right)$$

Input interpretation:

$$-1239.790786995002761094286520846148751810615082418856597 9+$$
$$1199.475473836717814009119464784297227233346871548316273 6\,i$$

i is the imaginary unit

Result:

$$-1239.790786995002761094286520846148751810615082418856597 9\ldots+$$
$$1199.475473836717814009119464784297227233346871548316273 6\ldots\,i$$

Polar coordinates:

$r = 1725.057276687793641747987881153083975872153333110567417 0$ (radius),

$\theta = 135.946877771901020330328757877880451385920040763850463729°$ (angle)

1725.05727668…. result in the range of the mass of candidate “glueball” $f_0(1710)$ (“glueball” =1760 ± 15 MeV).

(((27*[(((-(-1)^(3/5) 5^(-2 i) exp(-6 * e^(2/5 i π) + 6 * e^(2 i π)))))+1i]+1i)))^1/15

Input:

$$\sqrt[15]{27\left(-(-1)^{3/5}\times 5^{-2\,i}\,\exp\left(-6\,e^{2/5\,i\,\pi}+6\,e^{2\,i\,\pi}\right)+1\,i\right)+1\,i}$$

i is the imaginary unit

Exact result:

$$\sqrt[15]{i+27\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}\right)}$$

Decimal approximation:

$$1.623045796608114931936371881543835927109341077977854696 0\ldots+$$
$$0.258898556590716042183558885140364590780696242694526220 25\ldots\,i$$

(using the principal branch of the logarithm for complex exponentiation)

Alternate forms:

$$\sqrt[15]{28\,i-27\,(-1)^{3/5}\,5^{-2\,i}\,e^{6-6\,e^{(2\,i\,\pi)/5}}}$$

$$\sqrt[15]{5^{-2\,i}\,e^{-6(-1)^{2/5}}\left(-27\,(-1)^{3/5}\,e^{6}+28\,i\,5^{2\,i}\,e^{6(-1)^{2/5}}\right)}$$

$$\sqrt[15]{i+27\left(i-(-1)^{3/5}\,5^{-2\,i}\,e^{3/2\left[5-\sqrt{5}-i\sqrt{2\left(5+\sqrt{5}\right)}\right]}\right)}$$

Input interpretation:

$$1.623045796608114931936371881543835927109341077977854696\,0 + 0.258898556590716042183558885140364590780696242694526220\,25\,i$$

i is the imaginary unit

Result:

$$1.623045796608114931936371881543835927109341077977854696\ldots + 0.258898556590716042183558885140364590780696242694526220\,25\ldots\,i$$

Polar coordinates:

$r = 1.643565064270966603129364254118085286384208260972762669\,5$ (radius),

$\theta = 9.063125184793401355355250525192030092394669384256697582°$ (angle)

$$1.64356506427\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$$

Possible closed forms:

$$\frac{2}{7}\,\pi\cot^2\left(\frac{606\,453}{948\,424}\right)+\frac{2\,i\left(-365-138\,e+91\,e^2\right)}{630-571\,e+54\,e^2} \approx 1.623045796608114948603450469978579032738025552250015216\,6 + 0.258898556590716042261481252875925238144813813365846622\,6\,i$$

$$\frac{2}{7}\pi\cot^2\left(\frac{606\,453}{948\,424}\right)+$$
$$i\pi \quad \text{root of } 660x^4+672x^3+2319x^2-3351x+260 \text{ near } x=0.08241 \approx$$
$$1.623045796608114948603450469978579032738025552250015216 6+$$
$$0.258898556590716042166008913318378687971177091639672735 6\,i$$

$$\frac{2}{7}\pi\cot^2\left(\frac{606\,453}{948\,424}\right)+i\left(-\frac{39\,364}{153}+\frac{23\,200}{153\,e}+\frac{668\,e}{9}\right)\approx$$
$$1.623045796608114948603450469978579032738025552250015216 6+$$
$$0.258898556590716037696575113900179407020367555514736561 5\,i$$

Now, we have that:

A comparison of the coefficients of the linear functions of τ on both sides leads to

$$\mu = 2-\lambda,$$
$$(6.3) \qquad a = 120\lambda - 2, \qquad b = -24^2\lambda(2-\lambda) - 19,$$
$$c = 25, \qquad d = -120(2-\lambda)+2.$$

We have therefore:

$$L_5^*(V_2\tau) = \sum_{\lambda=0}^{4} \eta\left(\frac{-2\cdot 5\tau - 5}{5\tau+2}\right)\eta\left(\frac{a\dfrac{\tau+24(2-\lambda)}{5}+b}{c\dfrac{\tau+24(2-\lambda)}{5}+d}\right)^{-1},$$

For $\lambda = 3$; $\tau = 1$, we obtain:

a = 120*3 – 2 = 358; b = -24^2*3(2-3)-19 = 1709; c = 25; d = -120(2-3)+2 = 122

eta[((-10-5)/(5+2))] * eta[(((358*1/5*(1+24(2-3))+1709)))/(((25*1/5*(1+24(2-3))+122)))]^-1

Input:

$$\frac{\eta\left(\frac{-10-5}{5+2}\right)}{\eta\left(\frac{358\times\frac{1}{5}(1+24(2-3))+1709}{25\times\frac{1}{5}(1+24(2-3))+122}\right)}$$

$\eta(\tau)$ is the Dedekind eta function

Exact result:

$$\frac{\eta\left(-\frac{15}{7}\right)}{\eta\left(\frac{311}{35}\right)}$$

Series representations:

$$\frac{\eta\left(\frac{-10-5}{5+2}\right)}{\eta\left(\frac{\frac{358}{5}(1+24(2-3))+1709}{\frac{25}{5}(1+24(2-3))+122}\right)} = -(-1)^{17/210}\exp\left(-\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{-30/7\,i\,k\,n\,\pi}}{k}+\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{622/35\,i\,k\,n\,\pi}}{k}\right)$$

$$\frac{\eta\left(\frac{-10-5}{5+2}\right)}{\eta\left(\frac{\frac{358}{5}(1+24(2-3))+1709}{\frac{25}{5}(1+24(2-3))+122}\right)} = -\frac{(-1)^{17/210}\sum_{k=-\infty}^{\infty}(-1)^k\,e^{-15/7\,i\,k\,(-1+3k)\,\pi}}{\sum_{k=-\infty}^{\infty}(-1)^k\,e^{311/35\,i\,k\,(-1+3k)\,\pi}}$$

$$\frac{\eta\left(\frac{-10-5}{5+2}\right)}{\eta\left(\frac{\frac{358}{5}(1+24(2-3))+1709}{\frac{25}{5}(1+24(2-3))+122}\right)} = \frac{\sum_{k=0}^{\infty}e^{622/35\,i\,(-1/24+k)\,\pi}\,p(k)}{\sum_{k=0}^{\infty}e^{-5/28\,i\,(-1+24k)\,\pi}\,p(k)}$$

Integral representation:

$$\frac{\eta\left(\frac{-10-5}{5+2}\right)}{\eta\left(\frac{\frac{358}{5}(1+24(2-3))+1709}{\frac{25}{5}(1+24(2-3))+122}\right)} =$$
$$\exp\left(\frac{i}{\pi}\int_{i}^{-\frac{15}{7}}\left(\text{WeierstrassZeta}[1,\text{WeierstrassInvariants}[\{1,t\}]]+\left(\frac{442}{137}-\frac{1351\,i}{685}\right)\text{WeierstrassZeta}\left[1,\text{WeierstrassInvariants}\left[\left\{1,\left(-\frac{4}{685}+\frac{11\,i}{685}\right)((193-193\,i)+(173+138\,i)\,t)\right\}\right]\right]\right)dt\right)$$

$\zeta(u;g_2,g_3)$ is the Weierstrass zeta function

From

$$\frac{\eta\left(\frac{-10-5}{5+2}\right)}{\eta\left(\frac{\frac{358}{5}(1+24(2-3))+1709}{\frac{25}{5}(1+24(2-3))+122}\right)} = -(-1)^{17/210}\exp\left(-\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{-30/7\,i\,k\,n\,\pi}}{k}+\sum_{n=1}^{\infty}\sum_{k=1}^{\infty}\frac{e^{622/35\,i\,k\,n\,\pi}}{k}\right)$$

For k = n = 1, we obtain:

-(-1)^(17/210) exp(-e^(-30/7 i π) + e^(622/35 i π))

Input:

$$-(-1)^{17/210}\exp\left(-e^{-30/7\,i\,\pi}+e^{622/35\,i\,\pi}\right)$$

i is the imaginary unit

Exact result:

$$-(-1)^{17/210}\,e^{e^{-(8\,i\,\pi)/35}-e^{-(2\,i\,\pi)/7}}$$

Decimal approximation:

$-1.057900513896655566282448387427510769118091404866400768\ldots -$
$0.420347402110350203830789381450513451199736816670002873 6\ldots\, i$

(using the principal branch of the logarithm for complex exponentiation)

Property:

$-(-1)^{17/210}\,e^{e^{-(8\,i\,\pi)/35}-e^{-(2\,i\,\pi)/7}}$ is a transcendental number

Alternate forms:

$$-(-1)^{17/210}\,e^{(-1)^{5/7}-(-1)^{27/35}}$$

$$e^{\cos((8\,\pi)/35)-\sin((3\,\pi)/14)}\left(\sin\left(\frac{17\,\pi}{210}\right)\sin\left(\cos\left(\frac{3\,\pi}{14}\right)-\sin\left(\frac{8\,\pi}{35}\right)\right)-\cos\left(\frac{17\,\pi}{210}\right)\cos\left(\cos\left(\frac{3\,\pi}{14}\right)-\sin\left(\frac{8\,\pi}{35}\right)\right)\right)-$$
$$i\,e^{\cos((8\,\pi)/35)-\sin((3\,\pi)/14)}\left(\sin\left(\frac{17\,\pi}{210}\right)\cos\left(\cos\left(\frac{3\,\pi}{14}\right)-\sin\left(\frac{8\,\pi}{35}\right)\right)+\cos\left(\frac{17\,\pi}{210}\right)\sin\left(\cos\left(\frac{3\,\pi}{14}\right)-\sin\left(\frac{8\,\pi}{35}\right)\right)\right)$$

$$-(-1)^{17/210}\left(\exp\left(\text{root of } x^{24}-5x^{23}+15x^{22}-28x^{21}+35x^{20}-27x^{19}+32x^{18}-95x^{17}+397x^{16}-975x^{15}+1779x^{14}-1856x^{13}+641x^{12}+1964x^{11}-3811x^{10}+3902x^{9}-1158x^{8}-1132x^{7}+2224x^{6}-2067x^{5}+1264x^{4}-505x^{3}+121x^{2}-16x+1 \text{ near } x=0.129582+0.123893i\right)\right)$$

Alternative representations:

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=-(-1)^{17/210}\exp\left(-z^{1/7(i\pi)(-30)}+z^{1/35(i\pi)622}\right) \text{ for } z=e$$

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=-(-1)^{17/210}\exp\left(-w^{a}+w^{a}\right) \text{ for } \left(a=-\frac{30\,i\pi}{7\log(w)} \text{ and } a=\frac{622\,i\pi}{35\log(w)}\right)$$

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=-\exp\left(-\frac{2}{-1+\coth\left(-\frac{15\,i\pi}{7}\right)}+\frac{2}{-1+\coth\left(\frac{311\,i\pi}{35}\right)}\right)(-1)^{17/210}$$

Series representations:

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=-(-1)^{17/210}\exp\left(e^{-32/35\,i\sum_{k=0}^{\infty}(-1)^k/(1+2k)}-e^{-8/7\,i\sum_{k=0}^{\infty}(-1)^k/(1+2k)}\right)$$

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=-(-1)^{17/210}\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{\left(\sum_{k=0}^{\infty}1/k!\right)^{-(8\,i\pi)/35}-\left(\sum_{k=0}^{\infty}1/k!\right)^{-(2\,i\pi)/7}}$$

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=-(-1)^{17/210}\left(\frac{1}{\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}}\right)^{\left(1/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{-(8\,i\pi)/35}-\left(1/\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{k!}\right)\right)^{-(2\,i\pi)/7}}$$

Integral representations:

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=$$
$$-(-1)^{17/210}\exp\left(e^{-(32i)/35\int_0^1\sqrt{1-t^2}\,dt}-e^{-(8i)/7\int_0^1\sqrt{1-t^2}\,dt}\right)$$

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=$$
$$-(-1)^{17/210}\exp\left(e^{-(16i)/35\int_0^1 1/\sqrt{1-t^2}\,dt}-e^{-(4i)/7\int_0^1 1/\sqrt{1-t^2}\,dt}\right)$$

$$-(-1)^{17/210}\exp\left(-e^{1/7(i\pi)(-30)}+e^{1/35(i\pi)622}\right)=$$
$$-(-1)^{17/210}\exp\left(e^{-(16i)/35\int_0^\infty 1/(1+t^2)dt}-e^{-(4i)/7\int_0^\infty 1/(1+t^2)dt}\right)$$

Input interpretation:

$-1.057900513896655566282448387427510769118091404866400768 +$
$i\times(-0.420347402110350203830789381450513451199736816670002873 6)$

i is the imaginary unit

Result:

$-1.057900513896655566282448387427510769118091404866400768\ldots -$
$0.420347402110350203830789381450513451199736816670002873 6\ldots\, i$

Polar coordinates:

$r = 1.138352070215418189497237092817655628765004620357403691$ (radius),
$\theta = -158.330039367256976188755200137608352971134206091271129 31°$
(angle)

1.138352……

Summing with the previous result, we obtain:

(1.138352070+63.174329115)

Input interpretation:

$1.138352070 + 63.174329115$

Result:

64.312681185

64.312681185 ≈ 64

2(1.138352070+63.174329115)-Pi

Input interpretation:

$2\,(1.138352070 + 63.174329115) - \pi$

Result:

125.48376972...

125.48376972… result very near to the Higgs boson mass 125.18 GeV

27(1.138352070+63.174329115)-8+1/golden ratio

Input interpretation:

$27\,(1.138352070 + 63.174329115) - 8 + \frac{1}{\phi}$

ϕ is the golden ratio

Result:

1729.0604260...

1729.0604260…

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)

Alternative representations:

$$27\,(1.13835 + 63.1743291150000) - 8 + \frac{1}{\phi} = 1728.44 + \frac{1}{2\sin(54^\circ)}$$

$$27\,(1.13835 + 63.1743291150000) - 8 + \frac{1}{\phi} = 1728.44 + -\frac{1}{2\cos(216^\circ)}$$

$$27\,(1.13835 + 63.1743291150000) - 8 + \frac{1}{\phi} = 1728.44 + -\frac{1}{2\sin(666^\circ)}$$

From:

On certain trigonometrical sums and their applications in the theory of numbers – *Srinivasa Ramanujan* - Transactions of the Cambridge Philosophical Society, XXII, No.13, 1918, 259 – 276

We have that:

Then it follows from (7.5) that

$$\begin{aligned}&\sigma_s(1)+\sigma_s(2)+\cdots+\sigma_s(n)\\ &=\zeta(s+1)\left\{(1^s+2^s+\cdots+n^s)+\frac{T_{2,s}(n)}{2^{s+1}}+\frac{T_{3,s}(n)}{3^{s+1}}+\frac{T_{4,s}(n)}{4^{s+1}}+\cdots\right\}\end{aligned} \tag{16.7}$$

if $s>0$. Putting $s=1$ in (16.3) and (16.7), we find that

$$\begin{aligned}&(n-1)\sigma_{-1}(1)+(n-2)\sigma_{-1}(2)+\cdots+(n-n)\sigma_{-1}(n)\\ &=\frac{\pi^2}{6}\left\{\frac{n(n-1)}{2}+\frac{\nu_2(n)}{2^2}+\frac{\nu_3(n)}{3^2}+\frac{\nu_4(n)}{4^2}+\cdots\right\},\end{aligned} \tag{16.8}$$

where

$$\nu_r(n)=\tfrac{1}{2}\sum_{\lambda}\left\{\frac{\sin^2(\pi n\lambda/r)}{\sin^2(\pi\lambda/r)}-n\right\},$$

For n = 2; λ = 3; r = 48, from

$$\nu_r(n)=\tfrac{1}{2}\sum_{\lambda}\left\{\frac{\sin^2(\pi n\lambda/r)}{\sin^2(\pi\lambda/r)}-n\right\},$$

we obtain:

1/2*[(sin^2(6Pi/48))/(sin^2(3Pi/48)) – 2]

Input:

$$\frac{1}{2}\left(\frac{\sin^2\left(6\times\frac{\pi}{48}\right)}{\sin^2\left(3\times\frac{\pi}{48}\right)}-2\right)$$

Exact result:

$$\frac{1}{2}\left(\sin^2\left(\frac{\pi}{8}\right)\csc^2\left(\frac{\pi}{16}\right)-2\right)$$

$\csc(x)$ is the cosecant function

Decimal approximation:

0.923879532511286756128183189396788286822416625863642486115...

0.9238795325…

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

$$K^* \quad | \quad 5 \quad | \quad m_{u/d} = 0 - 240 \quad m_s = 0 - 390 \quad | \quad 0.848 - 0.927 \quad | \quad 0.32 - 0.62$$

Alternate forms:

$$\cos\left(\frac{\pi}{8}\right)$$

$$\frac{\sqrt{2+\sqrt{2}}}{2}$$

$$-\frac{1}{2}(-1)^{7/8}\left(1+\sqrt[4]{-1}\right)$$

Alternative representations:

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=\frac{1}{2}\left(-2+\frac{\left(\frac{1}{\csc\left(\frac{6\pi}{48}\right)}\right)^2}{\left(\frac{1}{\csc\left(\frac{3\pi}{48}\right)}\right)^2}\right)$$

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=\frac{1}{2}\left(-2+\frac{\cos^2\left(\frac{\pi}{2}-\frac{6\pi}{48}\right)}{\cos^2\left(\frac{\pi}{2}-\frac{3\pi}{48}\right)}\right)$$

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=\frac{1}{2}\left(-2+\frac{\left(-\cos\left(\frac{\pi}{2}+\frac{6\pi}{48}\right)\right)^2}{\left(-\cos\left(\frac{\pi}{2}+\frac{3\pi}{48}\right)\right)^2}\right)$$

Series representations:

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=-1-2\left(\sum_{k=1}^{\infty}q^{-1+2k}\right)^2\left(\sum_{k=0}^{\infty}\frac{(-1)^{3k}\left(\frac{3\pi}{8}\right)^{2k}}{(2k)!}\right)^2 \quad \text{for } q=\sqrt[16]{-1}$$

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=-1-2\left(\sum_{k=1}^{\infty}q^{-1+2k}\right)^2\left(\sum_{k=0}^{\infty}\frac{(-1)^{k}\,8^{-1-2k}\,\pi^{1+2k}}{(1+2k)!}\right)^2 \quad \text{for } q=\sqrt[16]{-1}$$

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=-1+128\left(\sum_{k=-\infty}^{\infty}\frac{e^{ik\pi}}{\pi-256k^2\pi}\right)^2\left(\sum_{k=0}^{\infty}\frac{(-1)^{3k}\left(\frac{3\pi}{8}\right)^{2k}}{(2k)!}\right)^2$$

Multiple-argument formulas:

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=-\frac{1}{2}(-1)^{7/8}\left(1+\sqrt[4]{-1}\right)$$

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=\frac{1}{2}\left(-2+\frac{4\cos^2\left(\frac{\pi}{16}\right)\csc^6\left(\frac{\pi}{48}\right)\sin^2\left(\frac{\pi}{16}\right)}{\left(-4+3\csc^2\left(\frac{\pi}{48}\right)\right)^2}\right)$$

$$\frac{1}{2}\left(\frac{\sin^2\left(\frac{6\pi}{48}\right)}{\sin^2\left(\frac{3\pi}{48}\right)}-2\right)=\frac{1}{2}\left(-2-\frac{\left(\sqrt[8]{-1}-\sqrt[8]{-1}\,e^{-(i\pi)/4}\right)^2\csc^6\left(\frac{\pi}{48}\right)}{4\left(-4+3\csc^2\left(\frac{\pi}{48}\right)\right)^2}\right)$$

(Pi^2)/6 [1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]

Input interpretation:

$$\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)$$

Result:

2.93247540...

2.93247540…. ≈ 3 (Fibonacci number)

Alternative representations:

$$\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2=\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2$$

$$\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2=\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)$$

$$\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2=\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(-i\log(-1))^2$$

Series representations:

$$\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2=4.75395\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^2$$

$$\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2 = 1.18849\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^2$$

$$\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2 = 0.297122\left(\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50\,k)}{\binom{3k}{k}}\right)^2$$

Integral representations:

$$\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2 = 1.18849\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^2$$

$$\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2 = 4.75395\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^2$$

$$\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2 = 1.18849\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^2$$

12((((2((((Pi^2)/6
[(1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]))^4-Pi))))-8

Input interpretation:

$$12\left(2\left(\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)\right)^4-\pi\right)-8$$

Result:
1729.09815...

1729.09815…

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)

Alternative representations:

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8+12\left(-\pi+2\left(\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)\right)^4\right)$$

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8+12\left(-180^\circ+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2\right)^4\right)$$

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8+12\left(-\cos^{-1}(-1)+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\cos^{-1}(-1)^2\right)^4\right)$$

Series representations:

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8-48\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+12\,258.3\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8$$

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8+12\left(2+3.99033\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^8-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)$$

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8-12\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}+0.187047\left(\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}\right)^8$$

Integral representations:

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8-24\int_0^\infty \frac{1}{1+t^2}\,dt+47.8839\left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^8$$

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8-24\int_0^\infty \frac{\sin(t)}{t}\,dt+47.8839\left(\int_0^\infty \frac{\sin(t)}{t}\,dt\right)^8$$

$$12\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-8=$$
$$-8-48\int_0^1 \sqrt{1-t^2}\,dt+12\,258.3\left(\int_0^1 \sqrt{1-t^2}\,dt\right)^8$$

We have also:

((((2((((Pi^2)/6 [(1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]))^4-Pi))))-5

Input interpretation:

$$\left(2\left(\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)\right)^4-\pi\right)-5$$

Result:

139.758180...

139.758180… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-\pi+2\left(\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-180^\circ+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-\cos^{-1}(-1)+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\cos^{-1}(-1)^2\right)^4$$

Series representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+1021.52\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-3+3.99033\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^8-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-x-2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}+0.0155872\left(x+2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}\right)^8 \quad \text{for } (x\in\mathbb{R} \text{ and } x>0)$$

Integral representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-2\int_0^{\infty}\frac{1}{1+t^2}\,dt+3.99033\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt+3.99033\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5=$$
$$-5-4\int_0^1\sqrt{1-t^2}\,dt+1021.52\left(\int_0^1\sqrt{1-t^2}\,dt\right)^8$$

((((2((((Pi^2)/6 [(1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]))))^4-Pi))))-18-1

Input interpretation:

$$\left(2\left(\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)\right)^4-\pi\right)-18-1$$

Result:

125.758180...

125.758180… result very near to the Higgs boson mass 125.18 GeV

Alternative representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-\pi+2\left(\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-180^\circ+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-\cos^{-1}(-1)+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\cos^{-1}(-1)^2\right)^4$$

Series representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+1021.52\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-17+3.99033\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^8-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-x-2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}+0.0155872\left(x+2\sum_{k=1}^{\infty}\frac{\sin(k\,x)}{k}\right)^8 \quad \text{for } (x\in\mathbb{R} \text{ and } x>0)$$

Integral representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-2\int_0^{\infty}\frac{1}{1+t^2}\,dt+3.99033\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt+3.99033\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-18-1=$$
$$-19-4\int_0^{1}\sqrt{1-t^2}\,dt+1021.52\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^8$$

((((2((((Pi^2)/6 [(1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]))))^4-Pi))))-5*2+1/4

Input interpretation:

$$\left(2\left(\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)\right)^4-\pi\right)-5\times2+\frac{1}{4}$$

Result:

135.008180...

135.008180… result practically equal to the rest mass of Pion meson 134.9766 MeV and to cubic root of Ramanujan number $135^3 = 135$

Alternative representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2\right)^4-\pi\right)-5\times2+\frac{1}{4}=$$
$$-10-\pi+\frac{1}{4}+2\left(\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2\right)^4-\pi\right)-5\times2+\frac{1}{4}=$$
$$-10-180^\circ+\frac{1}{4}+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2\right)^4-\pi\right)-5\times2+\frac{1}{4}=$$
$$-10-\cos^{-1}(-1)+\frac{1}{4}+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\cos^{-1}(-1)^2\right)^4$$

Series representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times2}{4}+\frac{0.92388\times2}{9}+\frac{0.92388\times2}{16}\right)\pi^2\right)^4-\pi\right)-5\times2+\frac{1}{4}=$$
$$-9.75-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+1021.52\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+\frac{1}{4}=$$
$$-\frac{31}{4}+3.99033\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^8-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+\frac{1}{4}=$$
$$-9.75-\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50\,k)}{\binom{3k}{k}}+0.0155872\left(\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50\,k)}{\binom{3k}{k}}\right)^8$$

Integral representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+\frac{1}{4}=$$
$$-9.75-2\int_0^{\infty}\frac{1}{1+t^2}\,dt+3.99033\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+\frac{1}{4}=$$
$$-9.75-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt+3.99033\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+\frac{1}{4}=$$
$$-9.75-4\int_0^{1}\sqrt{1-t^2}\,dt+1021.52\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^8$$

((((2((((Pi^2)/6 [(1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]))))^4-Pi))))+5^2+3-3/4

Input interpretation:

$$\left(2\left(\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)\right)^4-\pi\right)+$$
$$5^2+3-\frac{3}{4}$$

Result:

172.008180...

172.008180… result practically equal to cubic root of Ramanujan number $172^3 = 172$

Alternative representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=3-\pi-\frac{3}{4}+5^2+2\left(\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=3-180^\circ-\frac{3}{4}+5^2+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=3-\cos^{-1}(-1)-\frac{3}{4}+5^2+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\cos^{-1}(-1)^2\right)^4$$

Series representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=27.25-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+1021.52\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=\frac{117}{4}+3.99033\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^8-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=$$
$$27.25-\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50\,k)}{\binom{3k}{k}}+0.0155872\left(\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50\,k)}{\binom{3k}{k}}\right)^8$$

Integral representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=$$
$$27.25-2\int_0^{\infty}\frac{1}{1+t^2}\,dt+3.99033\left(\int_0^{\infty}\frac{1}{1+t^2}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=$$
$$27.25-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt+3.99033\left(\int_0^{\infty}\frac{\sin(t)}{t}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)+5^2+3-\frac{3}{4}=$$
$$27.25-4\int_0^{1}\sqrt{1-t^2}\,dt+1021.52\left(\int_0^{1}\sqrt{1-t^2}\,dt\right)^8$$

((((2((((Pi^2)/6
[(1+0.923879532(2)/4+0.923879532(2)/9+0.923879532(2)/16)]))^4-Pi))))-
5*2+3+1/4

Input interpretation:

$$\left(2\left(\frac{\pi^2}{6}\left(1+0.923879532\times\frac{2}{4}+0.923879532\times\frac{2}{9}+0.923879532\times\frac{2}{16}\right)\right)^4-\pi\right)-$$
$$5\times 2+3+\frac{1}{4}$$

Result:

138.008180...

138.008180… result practically equal to cubic root of Ramanujan number $138^3 = 138$

Alternative representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-7-\pi+\frac{1}{4}+2\left(\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\zeta(2)\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-7-180^\circ+\frac{1}{4}+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)(180^\circ)^2\right)^4$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-7-\cos^{-1}(-1)+\frac{1}{4}+2\left(\frac{1}{6}\left(1+\frac{1.84776}{4}+\frac{1.84776}{9}+\frac{1.84776}{16}\right)\cos^{-1}(-1)^2\right)^4$$

Series representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-6.75-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}+1021.52\left(\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-\frac{19}{4}+3.99033\left(-1+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)^8-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-6.75-\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}+0.0155872\left(\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}\right)^8$$

Integral representations:

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-6.75-2\int_0^\infty \frac{1}{1+t^2}\,dt+3.99033\left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-6.75-2\int_0^\infty \frac{\sin(t)}{t}\,dt+3.99033\left(\int_0^\infty \frac{\sin(t)}{t}\,dt\right)^8$$

$$\left(2\left(\frac{1}{6}\left(1+\frac{0.92388\times 2}{4}+\frac{0.92388\times 2}{9}+\frac{0.92388\times 2}{16}\right)\pi^2\right)^4-\pi\right)-5\times 2+3+\frac{1}{4}=$$
$$-6.75-4\int_0^1 \sqrt{1-t^2}\,dt+1021.52\left(\int_0^1 \sqrt{1-t^2}\,dt\right)^8$$

Now, we have that:

Suppose now that

$$x = e^{-\pi\alpha},\quad x' = e^{-2\pi/\alpha}.$$

if s is of the form $4k+2$;

$$(12.63)\qquad (1^{-s}-3^{-s}+5^{-s}-\cdots)\sum \delta'_{2s}(n)x^n = \frac{2(\frac{1}{8}\pi)^s}{(s-1)!}x^{-\frac{1}{4}s}$$
$$\times\left(\frac{1^{s-1}x^{\frac{1}{4}}}{1+x^{\frac{1}{2}}}+\frac{3^{s-1}x^{\frac{3}{4}}}{1+x^{\frac{3}{2}}}+\frac{5^{-s}x^{\frac{5}{4}}}{1+x^{\frac{5}{2}}}+\cdots+\frac{1^{s-1}x^{\frac{1}{4}}}{1-x^{\frac{1}{2}}}-\frac{3^{s-1}x^{\frac{3}{4}}}{1-x^{\frac{3}{2}}}+\frac{5^{s-1}x^{\frac{5}{4}}}{1-x^{\frac{5}{2}}}-\cdots\right)$$

$$(1^{-s}-3^{-s}+5^{-s}-\cdots)\sum \delta'_{2s}(n)x^n = \frac{2(\frac{1}{8}\pi)^s}{(s-1)!}x^{-\frac{1}{4}s}$$
$$\times\left(\frac{1^{s-1}x^{\frac{1}{4}}}{1+x^{\frac{1}{2}}}+\frac{3^{s-1}x^{\frac{3}{4}}}{1+x^{\frac{3}{2}}}+\frac{5^{-s}x^{\frac{5}{4}}}{1+x^{\frac{5}{2}}}+\cdots+\frac{1^{s-1}x^{\frac{1}{4}}}{1-x^{\frac{1}{2}}}-\frac{3^{s-1}x^{\frac{3}{4}}}{1-x^{\frac{3}{2}}}+\frac{5^{s-1}x^{\frac{5}{4}}}{1-x^{\frac{5}{2}}}-\cdots\right)$$

For s = 26, we obtain:

2(Pi/8)^26*((exp(-Pi^2)))^(-26/4) / (26-1)!

(((1^25*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^25*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-26)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{25}\exp^{0.25}(-\pi^2)}{1+\sqrt{\exp(-\pi^2)}}+\frac{3^{25}\exp^{\frac{3}{4}}(-\pi^2)}{1+\exp^{1.5}(-\pi^2)}+\frac{\frac{\exp^{\frac{5}{4}}(-\pi^2)}{5^{26}}}{1+\exp^{2.5}(-\pi^2)}$$

Result:

$5.1676746000\ldots \times 10^8$

$5.1676746\ldots*10^8$

(((1^25*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^25*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(25)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{25}\exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}}-\frac{3^{25}\exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)}+\frac{5^{25}\exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

$1.30672734888430\ldots \times 10^{12}$

$1.30672734888430\ldots*10^{12}$

(((((2(Pi/8)^26)) / (26-1)! * ((exp(-Pi^2)))^(-26/4)))) (5.1676746000 × 10^8 + 1.30672734888430 × 10^12)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{26}}{(26-1)!}\exp^{-\frac{26}{4}}(-\pi^2)\right)(5.1676746000\times 10^8+1.30672734888430\times 10^{12})$$

$n!$ is the factorial function

Result:

34146.310540632...

34146.310540632…

We note that for a(3649) = 34147 is a prime number (OEIS A000217)

For s = 10, we obtain:

(((1^9*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^9*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-10)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^9 \exp^{0.25}(-\pi^2)}{1+\sqrt{\exp(-\pi^2)}} + \frac{3^9 \exp^{\frac{3}{4}}(-\pi^2)}{1+\exp^{1.5}(-\pi^2)} + \frac{\frac{\exp^{\frac{5}{4}}(-\pi^2)}{5^{10}}}{1+\exp^{2.5}(-\pi^2)}$$

Result:

12.089004...

12.089004…

(((1^9*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^9*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(9)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^9 \exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}} - \frac{3^9 \exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)} + \frac{5^9 \exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

−3.352239...

-3.352239…

((((2(Pi/8)^10*((exp(-Pi^2)))^(-10/4) / (10-1)!)))) * (12.089004-3.352239)

Input interpretation:

$$\left(2\left(\frac{\pi}{8}\right)^{10} \times \frac{\exp^{-\frac{10}{4}}(-\pi^2)}{(10-1)!}\right)(12.089004 - 3.352239)$$

$n!$ is the factorial function

Result:

218.2746...

218.2746…

We note that for a(47) = 211; a(48) = 223 and [a(47)+a(48)] / 2 = 217 value very near to the result 218.2746

Alternative representations:

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{17.4735\exp^{-\frac{10}{4}}\left(-\pi^2\right)\left(\frac{\pi}{8}\right)^{10}}{\Gamma(10)}$$

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{17.4735\exp^{-\frac{10}{4}}\left(-\pi^2\right)\left(\frac{\pi}{8}\right)^{10}}{\Gamma(10,\,0)}$$

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{17.4735\exp^{-\frac{10}{4}}\left(-\pi^2\right)\left(\frac{\pi}{8}\right)^{10}}{(1)_9}$$

Series representation:

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{1.62735\times10^{-8}\,\pi^{10}}{\exp^{\frac{5}{2}}\left(-\pi^2\right)\sum_{k=0}^{\infty}\frac{(9-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}}$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 9)$

Integral representations:

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{1.62735\times10^{-8}\,\pi^{10}}{\exp^{\frac{5}{2}}\left(-\pi^2\right)\int_0^{\infty}e^{-t}\,t^9\,dt}$$

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{1.62735\times10^{-8}\,\pi^{10}}{\exp^{\frac{5}{2}}\left(-\pi^2\right)\int_0^1 \log^{\circ}\left(\frac{1}{t}\right)dt}$$

$$\frac{(12.089 - 3.35224)\,2\left(\left(\frac{\pi}{8}\right)^{10}\exp^{-\frac{10}{4}}\left(-\pi^2\right)\right)}{(10-1)!} = \frac{1.62735\times10^{-8}\,\pi^{10}}{\exp^{\frac{5}{2}}\left(-\pi^2\right)\left(\int_1^{\infty} e^{-t}\,t^{\circ}\,dt + \sum_{k=0}^{\infty}\frac{(-1)^k}{(10+k)k!}\right)}$$

For s = 42

(((1^41*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^41*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-42)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{41}\exp^{0.25}\left(-\pi^2\right)}{1+\sqrt{\exp\left(-\pi^2\right)}} + \frac{3^{41}\exp^{\frac{3}{4}}\left(-\pi^2\right)}{1+\exp^{1.5}\left(-\pi^2\right)} + \frac{\frac{\exp^{\frac{5}{4}}\left(-\pi^2\right)}{5^{42}}}{1+\exp^{2.5}\left(-\pi^2\right)}$$

Result:

$2.2245144669\ldots\times10^{16}$

2.2245144669…*10^{16}

(((1^41*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^41*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(41)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{41}\exp^{0.25}\left(-\pi^2\right)}{1-\sqrt{\exp\left(-\pi^2\right)}} - \frac{3^{41}\exp^{\frac{3}{4}}\left(-\pi^2\right)}{1-\exp^{1.5}\left(-\pi^2\right)} + \frac{5^{41}\exp^{\frac{5}{4}}\left(-\pi^2\right)}{1-\exp^{2.5}\left(-\pi^2\right)}$$

Result:

$1.99469600058397\ldots\times10^{23}$

1.994696…*10^{23}

((((2(Pi/8)^42*((exp(-Pi^2)))^(-42/4) / (42-1)!)))) * (2.2245144669 × 10^16+1.99469600058397 × 10^23)

Input interpretation:

$$\left(2\left(\frac{\pi}{8}\right)^{42}\times\frac{\exp^{-\frac{42}{4}}\left(-\pi^2\right)}{(42-1)!}\right)\left(2.2245144669\times10^{16}+1.99469600058397\times10^{23}\right)$$

$n!$ is the factorial function

Result:

107.96865722376...

107.96865722376…

We note that a(28) = 107; a(29) = 109 that are prime numbers and that the average is 108

For s = 30

(((1^29*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^29*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-30)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{29}\exp^{0.25}\left(-\pi^2\right)}{1+\sqrt{\exp\left(-\pi^2\right)}}+\frac{3^{29}\exp^{\frac{3}{4}}\left(-\pi^2\right)}{1+\exp^{1.5}\left(-\pi^2\right)}+\frac{\frac{\exp^{\frac{5}{4}}\left(-\pi^2\right)}{5^{30}}}{1+\exp^{2.5}\left(-\pi^2\right)}$$

Result:

$4.1858164254...\times10^{10}$

$4.1858164254…*10^{10}$

(((1^29*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^29*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(29)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{29}\exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}}-\frac{3^{29}\exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)}+\frac{5^{29}\exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

$8.16985714759981\ldots \times 10^{14}$

$8.1698571\ldots*10^{14}$

(((((2(Pi/8)^30)) / (30-1)! * ((exp(-Pi^2)))^(-30/4)))) * (4.1858164254 × 10^10 + 8.16985714759981× 10^14)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{30}}{(30-1)!}\exp^{-\frac{30}{4}}(-\pi^2)\right)(4.1858164254\times 10^{10}+8.16985714759981\times 10^{14})$$

$n!$ is the factorial function

Result:

17214.1242966829...

17214.1242966829…

We note that a(1983) = 17209; a(1984) = 17231 with average 17220

For s = 14

(((1^13*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^13*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-14)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{13}\exp^{0.25}(-\pi^2)}{1+\sqrt{\exp(-\pi^2)}}+\frac{3^{13}\exp^{\frac{3}{4}}(-\pi^2)}{1+\exp^{1.5}(-\pi^2)}+\frac{\frac{\exp^{\frac{5}{4}}(-\pi^2)}{5^{14}}}{1+\exp^{2.5}(-\pi^2)}$$

Result:

972.4733450...

972.4733450…

(((1^13*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^13*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(13)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{13}\exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}}-\frac{3^{13}\exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)}+\frac{5^{13}\exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

4382.167452...

4382.167452…

(((((2(Pi/8)^14)) / (14-1)! * ((exp(-Pi^2)))^(-14/4)))) * (972.4733450 + 4382.167452)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{14}}{(14-1)!}\exp^{-\frac{14}{4}}(-\pi^2)\right)(972.4733450+4382.167452)$$

$n!$ is the factorial function

Result:

3584.428952...

3584.428952…

We note that a(502) = 3583

Alternative representations:

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{10\,709.3\exp^{-\frac{14}{4}}\left(-\pi^2\right)\left(\frac{\pi}{8}\right)^{14}}{\Gamma(14)}$$

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{10\,709.3\exp^{-\frac{14}{4}}\left(-\pi^2\right)\left(\frac{\pi}{8}\right)^{14}}{\Gamma(14,\,0)}$$

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{10\,709.3\exp^{-\frac{14}{4}}\left(-\pi^2\right)\left(\frac{\pi}{8}\right)^{14}}{(1)_{13}}$$

Series representation:

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{2.43501\times10^{-9}\,\pi^{14}}{\exp^{Z}_{2}\left(-\pi^2\right)\sum_{k=0}^{\infty}\frac{(13-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}}$$

for $((n_0\notin\mathbb{Z}\text{ or }n_0\geq0)\text{ and }n_0\to13)$

Integral representations:

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{2.43501\times10^{-9}\,\pi^{14}}{\exp^{Z}_{2}\left(-\pi^2\right)\int_0^{\infty}e^{-t}\,t^{13}\,dt}$$

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{2.43501\times10^{-9}\,\pi^{14}}{\exp^{Z}_{2}\left(-\pi^2\right)\int_0^{1}\log^{13}\left(\frac{1}{t}\right)dt}$$

$$\frac{(972.473+4382.17)\left(2\left(\frac{\pi}{8}\right)^{14}\right)\exp^{-\frac{14}{4}}\left(-\pi^2\right)}{(14-1)!}=\frac{2.43501\times10^{-9}\,\pi^{14}}{\exp^{Z}_{2}\left(-\pi^2\right)\left(\int_1^{\infty}e^{-t}\,t^{13}\,dt+\sum_{k=0}^{\infty}\frac{(-1)^k}{(14+k)\,k!}\right)}$$

For s = 18

(((1^17*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^17*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-18)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{17}\exp^{0.25}(-\pi^2)}{1+\sqrt{\exp(-\pi^2)}}+\frac{3^{17}\exp^{\frac{3}{4}}(-\pi^2)}{1+\exp^{1.5}(-\pi^2)}+\frac{\exp^{\frac{5}{4}}(-\pi^2)}{5^{18}}}{1+\exp^{2.5}(-\pi^2)}$$

Result:

78763.604992...

78763.604992…

(((1^17*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^17*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(17)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{17}\exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}}-\frac{3^{17}\exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)}+\frac{5^{17}\exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

$3.267781444854... \times 10^6$

$3.2677814…*10^6$

(((((2(Pi/8)^18)) / (18-1)! * ((exp(-Pi^2)))^(-18/4))) * (78763.604992 + 3.267781444854 × 10^6)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{18}}{(18-1)!}\exp^{-\frac{18}{4}}(-\pi^2)\right)\left(78\,763.604992+3.267781444854\times10^6\right)$$

$n!$ is the factorial function

Result:

18032.3523002...

18032.3523002…

We note that a(2065) = 18013; a(2066) = 18041 with average 18027

For s = 22

(((1^21*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^21*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-22)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{21}\exp^{0.25}(-\pi^2)}{1+\sqrt{\exp(-\pi^2)}}+\frac{3^{21}\exp^{\frac{3}{4}}(-\pi^2)}{1+\exp^{1.5}(-\pi^2)}+\frac{\exp^{\frac{5}{4}}(-\pi^2)}{5^{22}}}{1+\exp^{2.5}(-\pi^2)}$$

Result:

$6.3798452684\ldots \times 10^6$

6.3798452684…*10^6

(((1^21*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^21*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(21)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{21}\exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}}-\frac{3^{21}\exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)}+\frac{5^{21}\exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

$2.0852107369205\ldots \times 10^9$

2.0852107…*10^9

(((((2(Pi/8)^22)) / (22-1)! * ((exp(-Pi^2)))^(-22/4)))) * (6.3798452684 × 10^6 + 2.0852107369205 × 10^9)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{22}}{(22-1)!}\exp^{-\frac{22}{4}}(-\pi^2)\right)\left(6.3798452684\times 10^6+2.0852107369205\times 10^9\right)$$

$n!$ is the factorial function

Result:

36075.40886729…

36075.40886729…

We note that a(3832) = 36073; a(3833) = 36083

For s = 34

(((1^33*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^33*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-34)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{33}\exp^{0.25}(-\pi^2)}{1+\sqrt{\exp(-\pi^2)}}+\frac{3^{33}\exp^{\frac{3}{4}}(-\pi^2)}{1+\exp^{1.5}(-\pi^2)}+\frac{\frac{\exp^{\frac{5}{4}}(-\pi^2)}{5^{34}}}{1+\exp^{2.5}(-\pi^2)}$$

Result:

$3.3905113045\ldots \times 10^{12}$

3.3905113045…*10^12

(((1^33*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^33*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(33)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{33}\exp^{0.25}(-\pi^2)}{1-\sqrt{\exp(-\pi^2)}}-\frac{3^{33}\exp^{\frac{3}{4}}(-\pi^2)}{1-\exp^{1.5}(-\pi^2)}+\frac{5^{33}\exp^{\frac{5}{4}}(-\pi^2)}{1-\exp^{2.5}(-\pi^2)}$$

Result:

$5.10638842583283\ldots \times 10^{17}$

5.1063884…*10^17

(((((2(Pi/8)^34)) / (34-1)! * ((exp(-Pi^2)))^(-34/4)))) * (3.3905113045 × 10^12 + 5.10638842583283 × 10^17)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{34}}{(34-1)!}\exp^{-\frac{34}{4}}\left(-\pi^2\right)\right)\left(3.3905113045\times10^{12}+5.10638842583283\times10^{17}\right)$$

$n!$ is the factorial function

Result:

5037.00472085705...

5037.00472…

We note that a(675) = 5039

For s = 38:

(((1^37*(exp(-Pi^2))^0.25))) / (((1+(exp(-Pi^2))^0.5))) + (((3^37*(exp(-Pi^2))^(3/4)))) / (((1+(exp(-Pi^2))^1.5))) + (((5^(-38)*(exp(-Pi^2))^(5/4)))) / (((1+(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{37}\exp^{0.25}\left(-\pi^2\right)}{1+\sqrt{\exp\left(-\pi^2\right)}}+\frac{3^{37}\exp^{\frac{3}{4}}\left(-\pi^2\right)}{1+\exp^{1.5}\left(-\pi^2\right)}+\frac{\exp^{\frac{5}{4}}\left(-\pi^2\right)}{5^{38}}+\frac{}{1+\exp^{2.5}\left(-\pi^2\right)}$$

Result:

$2.7463141567...\times10^{14}$

2.7463141567…*10^{14}

(((1^37*(exp(-Pi^2))^0.25))) / (((1-(exp(-Pi^2))^0.5))) - (((3^37*(exp(-Pi^2))^(3/4)))) / (((1-(exp(-Pi^2))^1.5))) + (((5^(37)*(exp(-Pi^2))^(5/4)))) / (((1-(exp(-Pi^2))^2.5)))

Input:

$$\frac{1^{37}\exp^{0.25}\left(-\pi^2\right)}{1-\sqrt{\exp\left(-\pi^2\right)}}-\frac{3^{37}\exp^{\frac{3}{4}}\left(-\pi^2\right)}{1-\exp^{1.5}\left(-\pi^2\right)}+\frac{5^{37}\exp^{\frac{5}{4}}\left(-\pi^2\right)}{1-\exp^{2.5}\left(-\pi^2\right)}$$

Result:

$3.19151121054074... \times 10^{20}$

$3.1915112…*10^{20}$

(((((2(Pi/8)^38)) / (38-1)! * ((exp(-Pi^2)))^(-38/4)))) * (2.7463141567... × 10^14 + 3.19151121054074× 10^20)

Input interpretation:

$$\left(\frac{2\left(\frac{\pi}{8}\right)^{38}}{(38-1)!}\exp^{-\frac{38}{4}}\left(-\pi^2\right)\right)\left(2.\overline{7463141567}\text{ (repeating decimal)}\times 10^{14}+3.19151121054074\times 10^{20}\right)$$

$n!$ is the factorial function

Result:

913.178045682853...

913.178045…

We note that a(156) = 911; a(157) = 919 and the average is 915

Thence, we have perform the calculations with s = 4k + 2 , for k = 2, 3, 4, 5, 6, 7, 8, 9, 10 and obtained the following results:

218.2746; 3584.4289; 18032.3523; 36075.4088; 34146.3105; 17214.1242;

5037.0047; 913.1780; 107.96865

That are near to the following prime numbers:

223; 3583; 18041; 36073; 34147; 17209; 5039; 911; 107

With differences:

5.2746; 1.4289; 9.3523; 2.4088; 0.6895; 5.1242; 2.0047; 2.1780; 0.96865

The sum of the difference is equal to:

5.2746 + 1.4289 + 9.3523 + 2.4088 + 0.6895 + 5.1242 + 2.0047 + 2.1780 + 0.96865

29.42965

29.42965 ≈ 29 = Lucas prime number

The sum of the results, instead, is:

Input interpretation:

218.2746 + 3584.4289 + 18 032.3523 + 36 075.4088 +
34 146.3105 + 17 214.1242 + 5037.0047 + 913.1780 + 107.96865

Result:

115329.05065

115329.05065

and the sum of the prime numbers is:

Input:

223 + 3583 + 18 041 + 36 073 + 34 147 + 17 209 + 5039 + 911 + 107

Result:

115 333

115333

The difference between the two results is equal to 4.05065 ≈ 4 that is a Lucas number.

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.

References

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