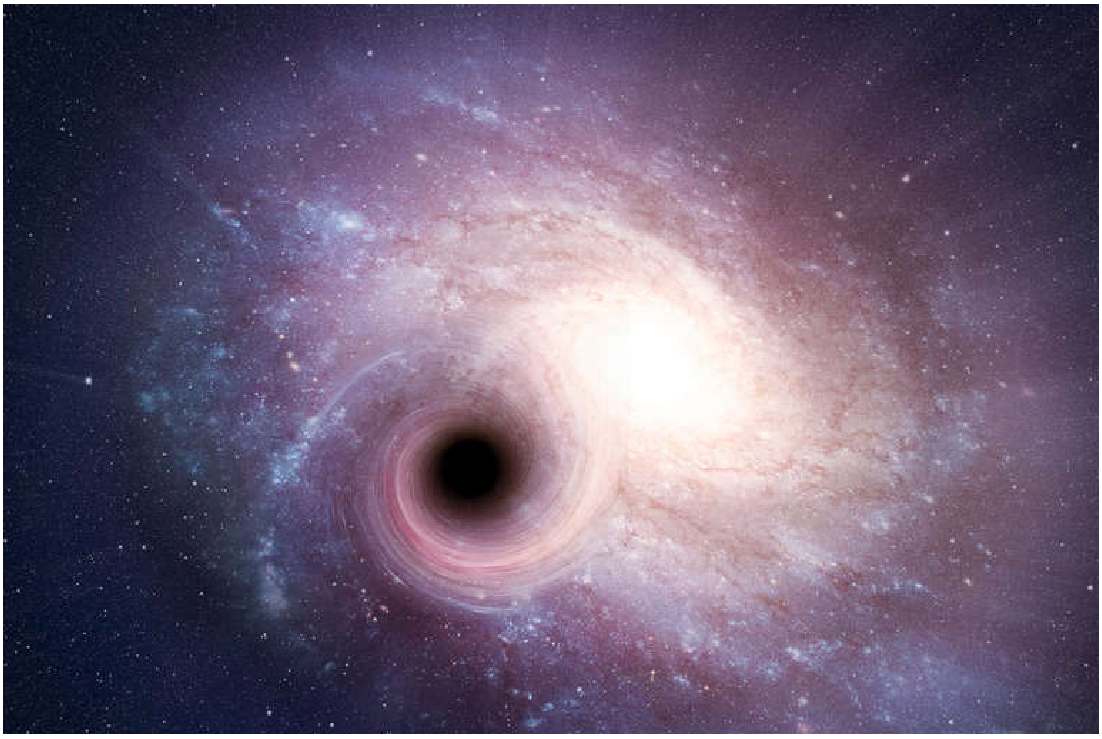
Analyzing two Ramanujan formulas: mathematical connections with various equations concerning some sectors of Black Holes ad Wormholes Physics III

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

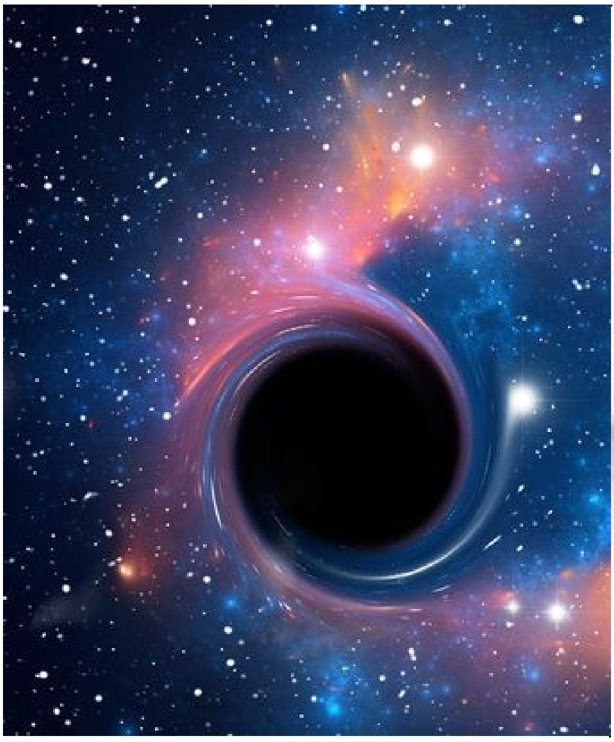
Abstract

The purpose of this paper is to show how using certain mathematical values and / or constants from two Ramanujan expressions, we obtain some mathematical connections with equations of various sectors of Black Holes and Wormholes Physics

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



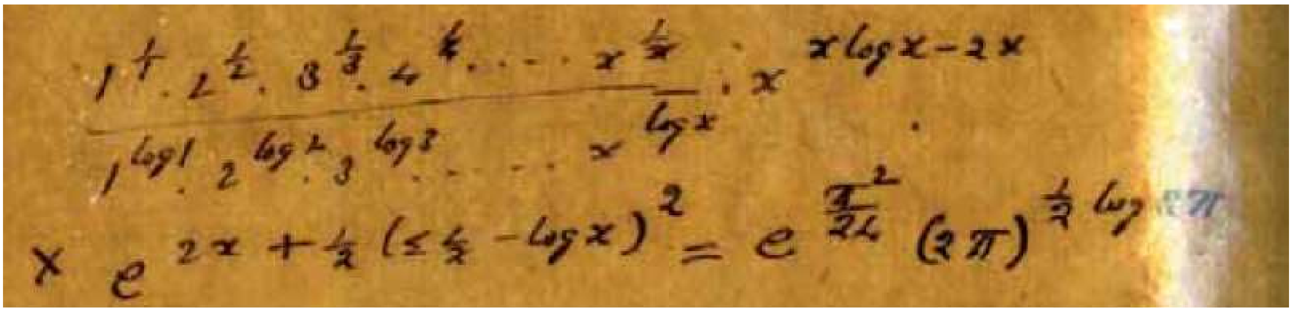
Monster black hole 100,000 times more massive than the sun is found in the heart of our galaxy (SMBH Sagittarius A = $1{,}9891*10^{35}$)
https://www.seeker.com/space/astronomy/new-class-of-black-hole-100000-times-larger-than-the-sun-detected-in-milky-way

(N.O.A – Pics. from the web)

From: **Manuscript Book 2 of Srinivasa Ramanujan**

page 101



$$\frac{1^{1} \cdot 2^{\frac{1}{2}} \cdot 3^{\frac{1}{3}} \cdot 4^{\frac{1}{4}} \cdots x^{\frac{1}{x}}}{1^{\log 1} \cdot 2^{\log 2} \cdot 3^{\log 3} \cdots x^{\log x}} \cdot x^{x \log x - 2x} \times e^{2x + \frac{1}{2}(S\frac{1}{2} - \log x)^2} = e^{\frac{\pi^2}{24}} (2\pi)^{\frac{1}{2} \log 2\pi}$$

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

Input:

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2 \log(2\pi)}$$

$\log(x)$ is the natural logarithm

Exact result:

$$e^{\pi^2/24}(2\pi)^{1/2 \log(2\pi)}$$

Decimal approximation:

8.167228090774159013444084972779671581805396045609743636831...

8.167228090774159…..

Alternate form:

$$e^{\pi^2/24}(2\pi)^{1/2 (\log(2)+\log(\pi))}$$

Alternative representations:

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2 \log(2\pi)} = \exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}$$

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2 \log(2\pi)} = \exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2 \log(a) \log_a(2\pi)}$$

Series representations:

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} = e^{\pi^2/24}\,(2\pi)^{1/2\left(\log(-1+2\pi)-\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k\right)}$$

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} = e^{\pi^2/24}\,(2\pi)^{1/2\left(2i\pi\left\lfloor\arg(2\pi-x)/(2\pi)\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k\right)} \quad \text{for } x<0$$

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} = e^{\pi^2/24}\,(2\pi)^{1/2\left(\log(z_0)+\left\lfloor\arg(2\pi-z_0)/(2\pi)\right\rfloor(\log(1/z_0)+\log(z_0))-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k\right)}$$

Integral representations:

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} = e^{\pi^2/24}\,(2\pi)^{1/2\int_1^{2\pi}1/t\,dt}$$

$$\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} = e^{\pi^2/24}\,(2\pi)^{-i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}$$

for $-1<\gamma<0$

$\Gamma(x)$ is the gamma function

1/5((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi)) + 11*1/10^3

Input:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} + 11\times\frac{1}{10^3}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}\,(2\pi)^{1/2\log(2\pi)}$$

Decimal approximation:

1.644445618154831802688816994555934316361079209121948727366...

1.6444456181548318….≈ ζ(2) = $\frac{\pi^2}{6}$ = 1.644934 ...

Alternate forms:

$$\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2(\log(2)+\log(\pi))}$$

$$\frac{11+25e^{\pi^2/24}2^{3+1/2\log(2\pi)}\pi^{1/2\log(2\pi)}}{1000}$$

$$\frac{11+25e^{\pi^2/24}2^{3+\log(2)/2+\log(\pi)/2}\pi^{\log(2)/2+\log(\pi)/2}}{1000}$$

Alternative representations:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}+\frac{11}{10^3}$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}+\frac{11}{10^3}$$

Series representations:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(\log(-1+2\pi)-\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k\right)}$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=$$
$$\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(2i\pi\left\lfloor\arg(2\pi-x)/(2\pi)\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k\right)}\quad\text{for } x<0$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=$$
$$\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(\log(z_0)+\left\lfloor\arg(2\pi-z_0)/(2\pi)\right\rfloor(\log(1/z_0)+\log(z_0))-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k\right)}$$

Integral representations:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\int_1^{2\pi}1/t\,dt}$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{11}{10^3}=$$
$$\frac{11}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{-i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\Gamma(-s)^2\Gamma(1+s)\right)/\Gamma(1-s)\,ds} \quad \text{for } -1<\gamma<0$$

1/10^27 * (((1/5((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))+(34+5)*1/10^3)))

Input:

$$\frac{1}{10^{27}}\left(\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+(34+5)\times\frac{1}{10^3}\right)$$

log(x) is the natural logarithm

Exact result:

$$\frac{\frac{39}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Decimal approximation:

$1.6724456181548318026888169945559343163610792091219487\ldots\times10^{-27}$

$1.67244561815\ldots*10^{-27}$ result practically equal to the proton mass

Alternate forms:

$$\frac{\frac{39}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2(\log(2)+\log(\pi))}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{39}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}+\frac{e^{\pi^2/24}\,2^{1/2\log(2\pi)-27}\,\pi^{1/2\log(2\pi)}}{37\,252\,902\,984\,619\,140\,625}$$

$$\frac{39+25\,e^{\pi^2/24}\,2^{3+1/2\log(2\pi)}\,\pi^{1/2\log(2\pi)}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Alternative representations:

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}+\frac{39}{10^3}}{10^{27}}$$

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}+\frac{39}{10^3}}{10^{27}}$$

Series representations:

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{\frac{39}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(\log(-1+2\pi)-\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k\right)}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{\frac{39}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(2i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor+\log(x)-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k\right)}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}\quad\text{for } x<0$$

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{\frac{39}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(\log(z_0)+\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k\right)}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

Integral representations:

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{39+25\times 2^{3+1/2\int_1^{2\pi}1/t\,dt}\,e^{\pi^2/24}\,\pi^{1/2\int_1^{2\pi}1/t\,dt}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}+\frac{34+5}{10^3}}{10^{27}}=\frac{\frac{39}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{-i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\Gamma(-s)^2\Gamma(1+s)\right)/\Gamma(1-s)\,ds}}{1\,000\,000\,000\,000\,000\,000\,000\,000\,000}\quad\text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

1/10^19 * (((1/5((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))-(34-3)*1/10^3)))

Input:

$$\frac{1}{10^{19}}\left(\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}-(34-3)\times\frac{1}{10^3}\right)$$

log(x) is the natural logarithm

Exact result:

$$\frac{\frac{1}{5} e^{\pi^2/24} (2\pi)^{1/2 \log(2\pi)} - \frac{31}{1000}}{10\,000\,000\,000\,000\,000\,000}$$

Decimal approximation:

$1.6024456181548318026888169945559343163610792091219487... \times 10^{-19}$

1.60244561815483…*10^-19 result practically equal to the value to the elementary charge

Alternate forms:

$$\frac{\frac{1}{5} e^{\pi^2/24} (2\pi)^{1/2 (\log(2)+\log(\pi))} - \frac{31}{1000}}{10\,000\,000\,000\,000\,000\,000}$$

$$\frac{e^{\pi^2/24}\, 2^{1/2 \log(2\pi)-19}\, \pi^{1/2 \log(2\pi)}}{95\,367\,431\,640\,625} - \frac{31}{10\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{25\, e^{\pi^2/24}\, 2^{3+1/2 \log(2\pi)}\, \pi^{1/2 \log(2\pi)} - 31}{10\,000\,000\,000\,000\,000\,000\,000}$$

Alternative representations:

$$\frac{\frac{1}{5} \exp\left(\frac{\pi^2}{24}\right) (2\pi)^{1/2 \log(2\pi)} - \frac{34-3}{10^3}}{10^{19}} = \frac{\frac{1}{5} \exp\left(\frac{\pi^2}{24}\right) (2\pi)^{\log_e(2\pi)/2} - \frac{31}{10^3}}{10^{19}}$$

$$\frac{\frac{1}{5} \exp\left(\frac{\pi^2}{24}\right) (2\pi)^{1/2 \log(2\pi)} - \frac{34-3}{10^3}}{10^{19}} = \frac{\frac{1}{5} \exp\left(\frac{\pi^2}{24}\right) (2\pi)^{1/2 \log(a) \log_a(2\pi)} - \frac{31}{10^3}}{10^{19}}$$

Series representations:

$$\frac{\frac{1}{5} \exp\left(\frac{\pi^2}{24}\right) (2\pi)^{1/2 \log(2\pi)} - \frac{34-3}{10^3}}{10^{19}} = \frac{-\frac{31}{1000} + \frac{1}{5} e^{\pi^2/24} (2\pi)^{1/2 \left(\log(-1+2\pi) - \sum_{k=1}^{\infty} \left(\frac{1}{1-2\pi}\right)^k / k\right)}}{10\,000\,000\,000\,000\,000\,000}$$

$$\frac{\frac{1}{5} \exp\left(\frac{\pi^2}{24}\right) (2\pi)^{1/2 \log(2\pi)} - \frac{34-3}{10^3}}{10^{19}} = \frac{-\frac{31}{1000} + \frac{1}{5} e^{\pi^2/24} (2\pi)^{1/2 \left(2 i \pi \lfloor \arg(2\pi - x)/(2\pi) \rfloor + \log(x) - \sum_{k=1}^{\infty} \left((-1)^k (2\pi - x)^k x^{-k}\right)/k\right)}}{10\,000\,000\,000\,000\,000\,000} \quad \text{for } x < 0$$

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}-\frac{34-3}{10^3}}{10^{19}} = \frac{-\frac{31}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\left(\log(z_0)+\lfloor \arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k\right)}}{10\,000\,000\,000\,000\,000\,000}$$

Integral representations:

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}-\frac{34-3}{10^3}}{10^{19}} = \frac{-31+25\times 2^{3+1/2\int_1^{2\pi}1/t\,dt}\,e^{\pi^2/24}\,\pi^{1/2\int_1^{2\pi}1/t\,dt}}{10\,000\,000\,000\,000\,000\,000\,000}$$

$$\frac{\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}-\frac{34-3}{10^3}}{10^{19}} = \frac{-\frac{31}{1000}+\frac{1}{5}e^{\pi^2/24}(2\pi)^{-i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\Gamma(-s)^2\Gamma(1+s)\right)/\Gamma(1-s)\,ds}}{10\,000\,000\,000\,000\,000\,000} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

1/5((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))-(11+4)*1/10^3

Input:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}-(11+4)\times\frac{1}{10^3}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}-\frac{3}{200}$$

Decimal approximation:

1.618445618154831802688816994555934316361079209121948727366...

1.61844561815483…… result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternate forms:

$$\frac{1}{5}e^{\pi^2/24}(2\pi)^{1/2(\log(2)+\log(\pi))}-\frac{3}{200}$$

$$\frac{1}{200}\left(5\, e^{\pi^2/24}\, 2^{3+1/2\log(2\pi)}\, \pi^{1/2\log(2\pi)} - 3\right)$$

$$\frac{1}{200}\left(5\, e^{\pi^2/24}\, 2^{3+\log(2)/2+\log(\pi)/2}\, \pi^{\log(2)/2+\log(\pi)/2} - 3\right)$$

Alternative representations:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = \frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2} - \frac{15}{10^3}$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = \frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)} - \frac{15}{10^3}$$

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

Series representations:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = -\frac{3}{200} + \frac{1}{5}\, e^{\pi^2/24}\,(2\pi)^{1/2\left(\log(-1+2\pi) - \sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k\right)}$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = -\frac{3}{200} + \frac{1}{5}\, e^{\pi^2/24}\,(2\pi)^{1/2\left(2 i \pi \left\lfloor \arg(2\pi - x)/(2\pi)\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\left((-1)^k (2\pi - x)^k x^{-k}\right)/k\right)} \quad \text{for } x < 0$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = -\frac{3}{200} + \frac{1}{5}\, e^{\pi^2/24}\,(2\pi)^{1/2\left(\log(z_0) + \left\lfloor \arg(2\pi - z_0)/(2\pi)\right\rfloor \left(\log(1/z_0) + \log(z_0)\right) - \sum_{k=1}^{\infty}\left((-1)^k (2\pi - z_0)^k z_0^{-k}\right)/k\right)}$$

Integral representations:

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = -\frac{3}{200} + \frac{1}{5}\, e^{\pi^2/24}\,(2\pi)^{1/2\int_1^{2\pi} 1/t\, dt}$$

$$\frac{1}{5}\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)} - \frac{11+4}{10^3} = -\frac{3}{200} + \frac{1}{5}\, e^{\pi^2/24}\,(2\pi)^{-i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\, ds} \quad \text{for } -1 < \gamma < 0$$

$\Gamma(x)$ is the gamma function

1010*1/(((((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))))))+sqrt3

where 1010 is in the following Ramanujan expression (Ramanujan taxicab numbers):

$$791^3 + 812^3 = 1010^3 - 1$$

1010 = (1+791^3+812^3)^1/3

Thence:

(1+791^3+812^3)^1/3*1/(((((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))))))+sqrt3

Input:

$$\sqrt[3]{1 + 791^3 + 812^3} \times \frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2 \log(2\pi)}} + \sqrt{3}$$

log(x) is the natural logarithm

Exact result:

$$\sqrt{3} + 505\, e^{-\pi^2/24}\, 2^{1-1/2 \log(2\pi)}\, \pi^{-1/2 \log(2\pi)}$$

Decimal approximation:

125.39701874704804156679784211551903141382141510577463396 43...

125.397018747….. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternate forms:

$$\sqrt{3} + 505\, e^{-\pi^2/24}\, 2^{1-\log(2)/2-\log(\pi)/2}\, \pi^{-\log(2)/2-\log(\pi)/2}$$

$$e^{-\pi^2/24}\, (2\pi)^{-1/2 \log(2\pi)} \left(1010 + \sqrt{3}\, e^{\pi^2/24}\, (2\pi)^{1/2 \log(2\pi)}\right)$$

$$\sqrt{3} + 505\, e^{-\pi^2/24}\, 2^{1+1/2(-\log(2)-\log(\pi))}\, \pi^{1/2(-\log(2)-\log(\pi))}$$

Alternative representations:

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3}=\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}}+\sqrt{3}$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3}=\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}}+\sqrt{3}$$

Series representations:

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3}=e^{-\pi^2/24}\,(2\pi)^{-1/2\log(-1+2\pi)}\left(505\times 2^{1+1/2\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k}\,\pi^{1/2\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k}+\sqrt{3}\,e^{\pi^2/24}\,(2\pi)^{1/2\log(-1+2\pi)}\right)$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3}=e^{-\pi^2/24}\,(2\pi)^{-i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor-\log(x)/2}\left(505\times 2^{1+1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k}\,\pi^{1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k}+\sqrt{3}\,e^{\pi^2/24}\,(2\pi)^{i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor+\log(x)/2}\right)\quad\text{for } x<0$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3}=e^{-\pi^2/24}\,(2\pi)^{-1/2\log(z_0)-1/2\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))}\left(505\times 2^{1+1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k}\,\pi^{1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k}+\sqrt{3}\,e^{\pi^2/24}\,(2\pi)^{\log(z_0)/2+1/2\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))}\right)$$

Integral representations:

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3}=e^{-\pi^2/24}\,(2\pi)^{-1/2\int_1^{2\pi}1/t\,dt}\left(1010+\sqrt{3}\,e^{\pi^2/24}\,(2\pi)^{1/2\int_1^{2\pi}1/t\,dt}\right)$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{3} =$$

$$e^{-\pi^2/24}\left(\sqrt{3}\ e^{\pi^2/24}+505\times 2^{1+i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}\ \pi^{i/(4\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}\right) \text{ for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

(1+791^3+812^3)^1/3*1/(((((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi)))))+sqrt8+13

Input:

$$\sqrt[3]{1+791^3+812^3}\times\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13$$

$\log(x)$ is the natural logarithm

Exact result:

$$13+2\sqrt{2}+505\,e^{-\pi^2/24}\,2^{1-1/2\log(2\pi)}\,\pi^{-1/2\log(2\pi)}$$

Decimal approximation:

139.49339506422535437087377322243255520401795360271814948 26...

139.493395064….. result practically equal to the rest mass of Pion meson 134.9766 MeV

Alternate forms:

$$13+2\sqrt{2}+505\,e^{-\pi^2/24}\,2^{1-\log(2)/2-\log(\pi)/2}\,\pi^{-\log(2)/2-\log(\pi)/2}$$

$$13+2\sqrt{2}+505\,e^{-\pi^2/24}\,2^{1+1/2(-\log(2)-\log(\pi))}\,\pi^{1/2(-\log(2)-\log(\pi))}$$

$$e^{-\pi^2/24}(2\pi)^{-1/2\log(2\pi)}\left(1010+e^{\pi^2/24}\,2^{3/2+1/2\log(2\pi)}\,\pi^{1/2\log(2\pi)}+13\,e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}\right)$$

Alternative representations:

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13 = 13+\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}}+\sqrt{8}$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13=13+\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}}+\sqrt{8}$$

Series representations:

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13=$$
$$e^{-\pi^2/24}(2\pi)^{-1/2\log(-1+2\pi)}\left(2^{3/2+1/2\log(-1+2\pi)}e^{\pi^2/24}\pi^{1/2\log(-1+2\pi)}+\right.$$
$$\left.505\times 2^{1+1/2\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k}\pi^{1/2\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k}+13e^{\pi^2/24}(2\pi)^{1/2\log(-1+2\pi)}\right)$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13=e^{-\pi^2/24}(2\pi)^{-i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor-\log(x)/2}$$
$$\left(2^{3/2+i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor+\log(x)/2}e^{\pi^2/24}\pi^{i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor+\log(x)/2}+\right.$$
$$505\times 2^{1+1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k}\pi^{1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k}+$$
$$\left.13e^{\pi^2/24}(2\pi)^{i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor+\log(x)/2}\right)\quad\text{for } x<0$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13=$$
$$e^{-\pi^2/24}(2\pi)^{-1/2\log(z_0)-1/2\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))}$$
$$\left(2^{3/2+\log(z_0)/2+1/2\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))}\right.$$
$$e^{\pi^2/24}\pi^{\log(z_0)/2+1/2\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))}+$$
$$505\times 2^{1+1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k}\pi^{1/2\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k}+$$
$$\left.13e^{\pi^2/24}(2\pi)^{\log(z_0)/2+1/2\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))}\right)$$

Integral representations:

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13=e^{-\pi^2/24}(2\pi)^{-1/2\int_1^{2\pi}1/t\,dt}$$
$$\left(1010+2^{3/2+1/2\int_1^{2\pi}1/t\,dt}e^{\pi^2/24}\pi^{1/2\int_1^{2\pi}1/t\,dt}+13e^{\pi^2/24}(2\pi)^{1/2\int_1^{2\pi}1/t\,dt}\right)$$

$$\frac{\sqrt[3]{1+791^3+812^3}}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}+\sqrt{8}+13 =$$

$$e^{-\pi^2/24}\left(13\, e^{\pi^2/24}+2\sqrt{2}\; e^{\pi^2/24}+505\times 2^{1+i/(4\pi)\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}\right.$$
$$\left.\pi^{i/(4\pi)\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}\right) \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

6ln(((((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi)))))

Input:

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$6\log\left(e^{\pi^2/24}\,(2\pi)^{1/2\log(2\pi)}\right)$$

Decimal approximation:

12.600777433972604781052210314196087394345802851708380800087...

12.60077743…. result very near to the black hole entropy 12.5664

Alternate forms:

$$6\left(\frac{\pi^2}{24}+\frac{1}{2}(\log(2)+\log(\pi))^2\right)$$

$$\frac{\pi^2}{4}+3\left(\log^2(2)+\log(\pi)\log(4\pi)\right)$$

$$\frac{\pi^2}{4}+3\log^2(2)+\log(\pi)\left(\log(64)+3\log(\pi)\right)$$

Alternative representations:

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)=6\log_e\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)$$

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)=6\log(a)\log_a\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)$$

Series representations:

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right) = 6\log\left(-1+e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}\right) - 6\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{-1+e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}}\right)^k}{k}$$

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right) = 12\,i\,\pi\left\lfloor\frac{\arg\left(e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)} - x\right)}{2\pi}\right\rfloor + 6\log(x) - 6\sum_{k=1}^{\infty}\frac{(-1)^k\left(e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)} - x\right)^k x^{-k}}{k} \quad \text{for } x<0$$

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right) = 12\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor + 6\log(z_0) - 6\sum_{k=1}^{\infty}\frac{(-1)^k\left(e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)} - z_0\right)^k z_0^{-k}}{k}$$

Integral representations:

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right) = 6\int_1^{e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}}\frac{1}{t}\,dt$$

$$6\log\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right) = -\frac{3\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\left(-1+e^{\pi^2/24}(2\pi)^{1/2\log(2\pi)}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

We note that:

8+((3 π)/2 - 8/π)(((((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi)))))^(2e)

Input:

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}$$

log(x) is the natural logarithm

Exact result:

$$8+e^{(e\pi^2)/12}\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)(2\pi)^{e\log(2\pi)}$$

Decimal approximation:

196883.8594170949388885780813427654669997355011537993536876...

196883.859417…. 196884 is a fundamental number of the following j-invariant

$$j(\tau)=q^{-1}+744+196884q+21493760q^2+864299970q^3+20245856256q^4+\cdots$$

(In mathematics, Felix Klein's j-invariant or j function, regarded as a function of a complex variable τ, is a modular function of weight zero for SL(2, Z) defined on the upper half plane of complex numbers. Several remarkable properties of j have to do with its q expansion (Fourier series expansion), written as a Laurent series in terms of $q = e^{2\pi i\tau}$ (the square of the nome), which begins:

$$j(\tau)=q^{-1}+744+196884q+21493760q^2+864299970q^3+20245856256q^4+\cdots$$

Note that j has a simple pole at the cusp, so its q-expansion has no terms below q^{-1}.

All the Fourier coefficients are integers, which results in several almost integers, notably Ramanujan's constant:

$$e^{\pi\sqrt{163}}\approx 640320^3+744.$$

The asymptotic formula for the coefficient of q^n is given by

$$\frac{e^{4\pi\sqrt{n}}}{\sqrt{2}\,n^{3/4}},$$

as can be proved by the Hardy–Littlewood circle method)

Alternate forms:

$$8+e^{(e\pi^2)/12}\,(3\pi^2-16)\,(2\pi)^{e\log(2\pi)-1}$$

$$8+e^{(e\pi^2)/12}\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)(2\pi)^{e(\log(2)+\log(\pi))}$$

$$8-e^{(e\pi^2)/12}\,2^{3+e\log(2\pi)}\,\pi^{e\log(2\pi)-1}+3\,e^{(e\pi^2)/12}\,2^{e\log(2\pi)-1}\,\pi^{1+e\log(2\pi)}$$

Alternative representations:

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}=8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}\right)^{2e}$$

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}=8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}\right)^{2e}$$

Series representations:

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}=$$
$$8+e^{(e\pi^2)/12}\,(2\pi)^{e\left(\log(-1+2\pi)-\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k\right)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)$$

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}=8+$$
$$e^{(e\pi^2)/12}\,(2\pi)^{e\left(2i\pi\lfloor\arg(2\pi-x)/(2\pi)\rfloor+\log(x)-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k\right)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)\quad\text{for } x<0$$

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}=8+e^{(e\pi^2)/12}$$
$$(2\pi)^{e\left(\log(z_0)+\lfloor\arg(2\pi-z_0)/(2\pi)\rfloor(\log(1/z_0)+\log(z_0))-\sum_{k=1}^{\infty}\left((-1)^k(2\pi-z_0)^k z_0^{-k}\right)/k\right)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)$$

Integral representations:

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}=8+e^{(e\pi^2)/12}\,(2\pi)^{-1+e\int_1^{2\pi}1/t\,dt}\,(-16+3\pi^2)$$

$$8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e} = 8 + e^{(e\pi^2)/12}\,(2\pi)^{-(i e)/(2\pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s))/\Gamma(1-s)\,ds}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right) \text{ for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

and:

ln((((8+((3 π)/2 - 8/π)(((((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi)))))^(2e)))))

Input:

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$\log\left(8+e^{(e\pi^2)/12}\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)(2\pi)^{e\log(2\pi)}\right)$$

Decimal approximation:

12.19036928776337087619295426122724036070286571656595853816...

12.190369287… result practically equal to the black hole entropy 12.1904

Alternate forms:

$$\log\left(8+e^{(e\pi^2)/12}\,(3\pi^2-16)\,(2\pi)^{e\log(2\pi)-1}\right)$$

$$\log\left(8+e^{(e\pi^2)/12}\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)(2\pi)^{e(\log(2)+\log(\pi))}\right)$$

$$\log\left(\frac{16\pi-e^{(e\pi^2)/12}\,2^{4+e\log(2\pi)}\,\pi^{e\log(2\pi)}+3\,e^{(e\pi^2)/12}\,2^{e\log(2\pi)}\,\pi^{2+e\log(2\pi)}}{2\pi}\right)$$

Alternative representations:

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)=$$
$$\log_e\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)$$

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)=$$
$$\log(a)\log_a\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)$$

Series representations:

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)=$$
$$\log\left(7+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)\right)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{7+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)}\right)^k}{k}$$

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)=2i\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+$$
$$\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\left(8+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)-z_0\right)^k z_0^{-k}}{k}$$

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)=$$
$$2i\pi\left\lfloor\frac{\arg\left(8+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)-x\right)}{2\pi}\right\rfloor+\log(x)-$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(8+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representations:

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right)=\int_1^{8+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)}\frac{1}{t}\,dt$$

$$\log\left(8+\left(\frac{3\pi}{2}-\frac{8}{\pi}\right)\left(\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}\right)^{2e}\right) = -\frac{i}{2\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(7+e^{(e\pi^2)/12}(2\pi)^{e\log(2\pi)}\left(-\frac{8}{\pi}+\frac{3\pi}{2}\right)\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

(((1/(((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))))))^1/64

Input:

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$e^{-\pi^2/1536}\,(2\pi)^{-1/128\log(2\pi)}$$

Decimal approximation:

0.967718030864941413992713190507503998528600334220001452837...

0.96771803086494…. result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 and to the value of the following Rogers-Ramanujan continued fraction:

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

From:

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

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

Alternate form:

$$e^{-\pi^2/1536} (2\pi)^{1/128(-\log(2)-\log(\pi))}$$

All 64th roots of e^(-π^2/24) (2 π)^(-1/2 log(2 π)):

$$e^{-\pi^2/1536} e^0 (2\pi)^{-1/128\log(2\pi)} \approx 0.967718 \text{ (real, principal root)}$$

$$e^{-\pi^2/1536} e^{(i\pi)/32} (2\pi)^{-1/128\log(2\pi)} \approx 0.96306 + 0.09485 i$$

$$e^{-\pi^2/1536} e^{(i\pi)/16} (2\pi)^{-1/128\log(2\pi)} \approx 0.94912 + 0.18879 i$$

$$e^{-\pi^2/1536} e^{(3i\pi)/32} (2\pi)^{-1/128\log(2\pi)} \approx 0.92605 + 0.28091 i$$

$$e^{-\pi^2/1536} e^{(i\pi)/8} (2\pi)^{-1/128\log(2\pi)} \approx 0.89405 + 0.37033 i$$

Alternative representations:

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} = \sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}}}$$

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} = \sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}}}$$

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

Series representations:

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} = e^{-\pi^2/1536} (2\pi)^{1/128\left(-\log(-1+2\pi)+\sum_{k=1}^{\infty}\left(\frac{1}{1-2\pi}\right)^k/k\right)}$$

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} = e^{-\pi^2/1536} (2\pi)^{1/128\left(-2i\pi\left\lfloor\arg(2\pi-x)/(2\pi)\right\rfloor-\log(x)+\sum_{k=1}^{\infty}\left((-1)^k(2\pi-x)^k x^{-k}\right)/k\right)} \quad \text{for } x < 0$$

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} =$$
$$e^{-\pi^2/1536}\,(2\pi)^{1/128\left(-\log(z_0)-\lfloor \arg(2\pi-z_0)/(2\pi)\rfloor (\log(1/z_0)+\log(z_0))+\sum_{k=1}^{\infty}\left((-1)^k (2\pi-z_0)^k z_0^{-k}\right)/k\right)}$$

Integral representations:

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} = e^{-\pi^2/1536}\,(2\pi)^{-1/128\int_1^{2\pi} 1/t\,dt}$$

$$\sqrt[64]{\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}} = e^{-\pi^2/1536}\,(2\pi)^{i/(256\pi)\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}$$
for $-1 < \gamma < 0$

$\Gamma(x)$ is the gamma function

log base 0.967718030864941413992713 19(((1/(((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))))))

Input interpretation:

$$\log_{0.96771803086494141399271319}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right)$$

$\log(x)$ is the natural logarithm

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

Result:

64.000000000000000000000...

64

Alternative representations:

$$\log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = \frac{\log\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right)}{\log(0.96771803086494141399271319000)}$$

$$\log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = \log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{\log_e(2\pi)/2}}\right)$$

$$\log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = \log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(a)\log_a(2\pi)}}\right)$$

Series representations:

$$\log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = -\frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\frac{2^{-1/2\log(2\pi)}\pi^{-1/2\log(2\pi)}}{\exp\left(\frac{\pi^2}{24}\right)}\right)^k}{k}}{\log(0.96771803086494141399271319000)}$$

$$\log_{0.96771803086494141399271319000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = \log_{0.96771803086494141399271319000}\left(\frac{2^{1/2\left(-\log(-1+2\pi)+\sum_{k=1}^{\infty}\left((-1)^k(-1+2\pi)^{-k}\right)/k\right)}\pi^{1/2\left(-\log(-1+2\pi)+\sum_{k=1}^{\infty}\left((-1)^k(-1+2\pi)^{-k}\right)/k\right)}}{\exp\left(\frac{\pi^2}{24}\right)}\right)$$

Integral representations:

$$\log_{0.967718030864941413992713190000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = \log_{0.967718030864941413992713190000}\left(\frac{2^{-1/2\int_1^{2\pi}1/t\,dt}\,\pi^{-1/2\int_1^{2\pi}1/t\,dt}}{\exp\left(\frac{\pi^2}{24}\right)}\right)$$

$$\log_{0.967718030864941413992713190000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right) = \log_{0.967718030864941413992713190000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)}\,2^{-1/(4 i \pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}\,\pi^{-1/(4 i \pi)\int_{-i\infty+\gamma}^{i\infty+\gamma}\left((-1+2\pi)^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)\right)/\Gamma(1-s)\,ds}\right) \text{ for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

((((log base 0.967718030864941413992713190000(((1/(((exp((Pi^2)/24))) (2Pi)^(1/2 ln (2Pi))))))))))^1/2

Input interpretation:

$$\sqrt{\log_{0.967718030864941413992713190000}\left(\frac{1}{\exp\left(\frac{\pi^2}{24}\right)(2\pi)^{1/2\log(2\pi)}}\right)}$$

$\log(x)$ is the natural logarithm

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

Result:

8.00000000000000000000000...

8

In conclusion, we have that:

(((exp((x^2)/24))) (2Pi)^(1/2 ln (2Pi))) = 8.16722809077415901344408

Input interpretation:

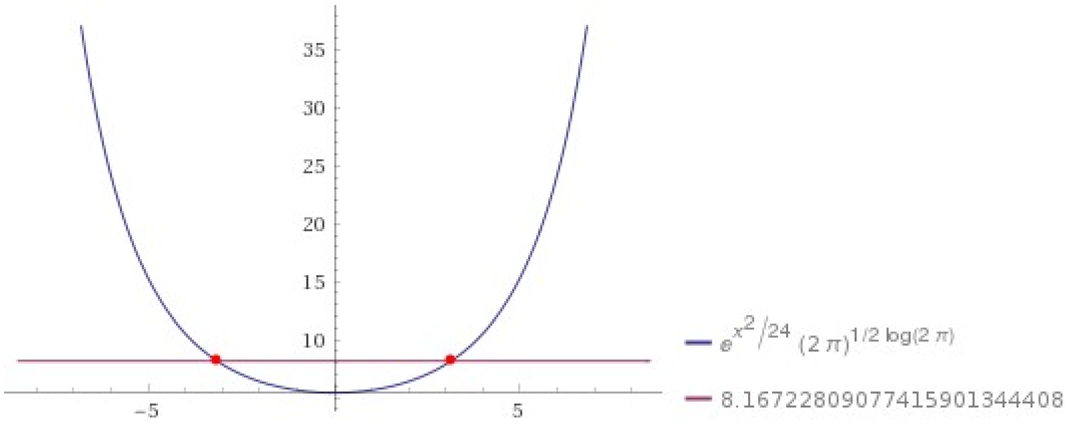
$$\exp\left(\frac{x^2}{24}\right)(2\pi)^{1/2\log(2\pi)} = 8.16722809077415901344408$$

log(x) is the natural logarithm

Result:

$$e^{x^2/24}(2\pi)^{1/2\log(2\pi)} = 8.16722809077415901344408$$

Plot:



Alternate forms:

$$e^{x^2/24} = 1.508677616863766589496 8$$

$$e^{x^2/24}(2\pi)^{1/2(\log(2)+\log(\pi))} = 8.16722809077415901344408$$

Alternate form assuming x is positive:

$$1.00000000000000000000000\, e^{x^2/24} = 1.50867761686376658949680$$

Alternate form assuming x is real:

$$\sqrt[24]{e^{x^2}}\,(2\pi)^{1/2\log(2\pi)} = 8.16722809077415901344408$$

Real solutions:

$x \approx -3.14159265358979323846264$

$x \approx 3.14159265358979323846264$

Solutions:

$$x \approx \frac{4.89897948556635619639457}{\sqrt{6.28318530717958647692 53\, i\, n + 0.41123351671205660911 81}}, \quad n \in \mathbb{Z}$$

$$x \approx \frac{-4.89897948556635619639457}{\sqrt{6.28318530717958647692 53\, i\, n + 0.41123351671205660911 81}}, \quad n \in \mathbb{Z}$$

$\mathbb{Z}$ is the set of integers

Possible closed forms:

$\pi \approx 3.14159265358979323846264 33832 = \boldsymbol{\pi}$

$\sqrt{6\,\zeta(2)} \approx 3.1415926535897932384626433832$

$\frac{1}{2\,\mathcal{P}_A} \approx 3.1415926535897932384626433832$

$\frac{1}{2\,C_{\mathrm{PTH}}} \approx 3.1415926535897932384626433832$

$\log(\mathcal{G}_{\mathrm{Ge}}) \approx 3.1415926535897932384626433832$

$\frac{128}{45\,\bar{s}_{\mathrm{ld}}} \approx 3.1415926535897932384626433832$

$\frac{3(-50 - 81\,e + 299\,e^2)}{79 - 427\,e + 397\,e^2} \approx 3.1415926535897932384603988$

$\log\left(\frac{1}{63}\left(23\left(\sqrt{2} - 6\right) + 114\,e + 303\,e^2 - 210\,\pi - 33\,\pi^2\right)\right) \approx 3.14159265358979323842 4714$

root of $108\,x^4 + 1717\,x^3 - 6952\,x^2 + 258\,x + 4045$ near $x = 3.14159$ $\approx 3.1415926535897932384 52342$

root of $15134\,x^3 - 53597\,x^2 + 28993\,x - 31352$ near $x = 3.14159$ $\approx 3.1415926535897932384 28911$

$\frac{1}{\text{root of } 4045\,x^4 + 258\,x^3 - 6952\,x^2 + 1717\,x + 108 \text{ near } x = 0.31831} \approx 3.1415926535897932384 52342$

$$\frac{1}{\text{root of } 31352 x^3 - 28993 x^2 + 53597 x - 15134 \text{ near } x = 0.31831} \approx$$
3.14159265358979323842891 1

$\text{root of } 305 x^5 - 1062 x^4 + 316 x^3 - 159 x^2 + 97 x + 1579 \text{ near } x = 3.14159 \approx$
3.1415926535897932384933 61

$\zeta(2)$ is zeta of 2

$\mathcal{P}_A$ is Plouffe's A-constant

C_{PTH} is the Pythagorean triple constant for hypotenuses

$\log(x)$ is the natural logarithm

G_{Ge} is Gelfond's constant

$\bar{s}_{ld}$ is the mean line-in-disk length

and:

(((exp((Pi^2)/x))) (2Pi)^(1/2 ln (2Pi))) = 8.16722809077415901344408

Input interpretation:

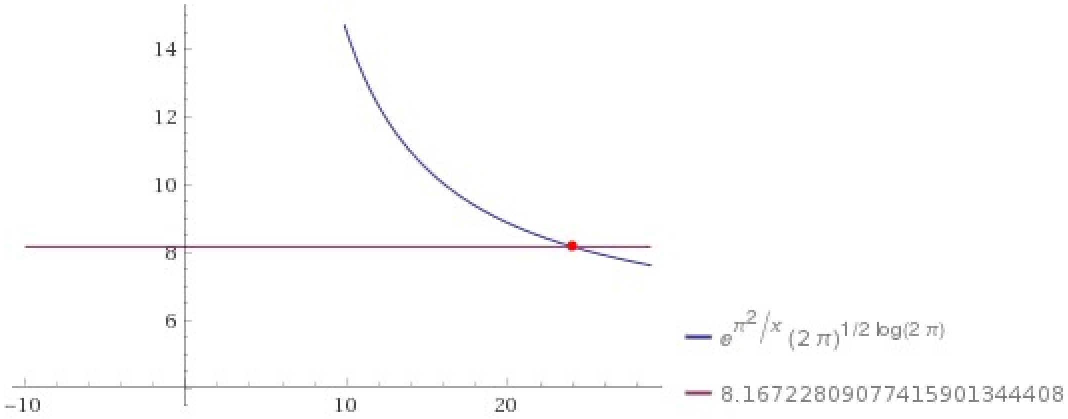
$$\exp\left(\frac{\pi^2}{x}\right)(2\pi)^{1/2 \log(2\pi)} = 8.16722809077415901344408$$

$\log(x)$ is the natural logarithm

Result:

$$e^{\pi^2/x}(2\pi)^{1/2 \log(2\pi)} = 8.16722809077415901344408$$

Plot:



Alternate forms:

$e^{\pi^2/x} = 1.50867761686376658949 68$

$e^{\pi^2/x} (2\pi)^{1/2 (\log(2)+\log(\pi))} = 8.16722809077415901344408$

Alternate form assuming x is positive:

$1.00000000000000000000000 \, e^{\pi^2/x} = 1.508677616863766589496 80$

Real solution:

$x \approx 24.0000000000000000000000$

24

This value is linked to the "Ramanujan function" (an elliptic modular function that satisfies the need for "conformal symmetry") that has 24 "modes" corresponding to the physical vibrations of a bosonic string.

Solution:

$$x \approx -\frac{9.869604401089358618834 5\, i}{6.283185307179586476925 3\, n - 0.411233516712056609118103\, i},$$

$$i\,(6.283185307179586476925 3\, n - 0.411233516712056609118103\, i) \neq 0\,, \quad n \in \mathbb{Z}$$

$\mathbb{Z}$ is the set of integers

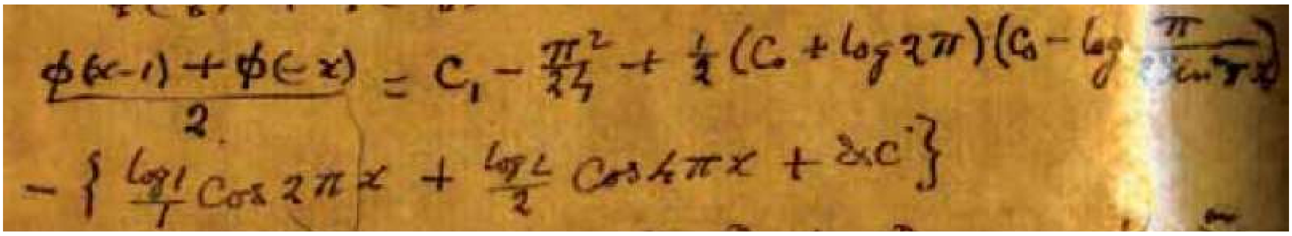
Integer solution:

$x = 24$

24 as above

Now, we have that

Page 101



$$\frac{\phi(x-1)+\phi(-x)}{2} = C_1 - \frac{\pi^2}{24} + \frac{1}{2}(C_0+\log 2\pi)\left(C_0-\log\frac{\pi}{2\sin\pi x}\right) - \left\{\frac{\log 1}{1}\cos 2\pi x + \frac{\log 2}{2}\cos 4\pi x + \&c\right\}$$

For x = 1/2, C_0 = 0.582879670292435 and C_1 = 0.072815845483680, we obtain:

0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi))))

Input interpretation:

$$0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi))\left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)$$

log(x) is the natural logarithm

Result:

−0.526072255238618...

-0.526072255…

Alternative representations:

$$0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi))\left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right) =$$

$$0.0728158454836800000 + \frac{1}{2}(0.5828796702924350000 + \log(2\pi))\left(0.5828796702924350000 - \log\left(\frac{\pi}{2\cos(0)}\right)\right) - \frac{1}{2}\log(1)\left(e^{-i\pi} + e^{i\pi}\right) - \frac{1}{4}\log(2)\left(e^{-2i\pi} + e^{2i\pi}\right) - \frac{\pi^2}{24}$$

$$0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)=$$

$$0.0728158454836800000-\cosh(i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2i\pi)\log(a)\log_a(2)+\frac{1}{2}(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}$$

$$0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)=$$

$$0.0728158454836800000-\cosh(-i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(-2i\pi)\log(a)\log_a(2)+\frac{1}{2}(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}$$

Integral representations:

$$0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)=$$

$$-0.0416666666666666667\left(-5.82456481209093279+1.00000000000000000\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.99455604350922000\log(2\pi)+6.99455604350922000\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)$$

$$0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)=$$
$$-0.0416666666666666667\left(-5.82456481209093279+1.00000000000000000\pi^2-24.0000000000000000\int_0^1\pi(\log(1)\sin(\pi t)+\log(2)\sin(2\pi t))\,dt+24.0000000000000000\log(1)+12.0000000000000000\log(2)-6.99455604350922000\log(2\pi)+6.99455604350922000\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)$$

$$0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)=$$
$$-0.0416666666666666667\left(-5.82456481209093279+1.00000000000000000\pi^2-24.0000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2e^{(3\pi^2)/(4s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4i\pi\sqrt{s}}\,ds-6.99455604350922000\log(2\pi)+6.99455604350922000\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\quad\text{for }\gamma>0$$

Multiple-argument formulas:

$$0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435000 + \log(2\pi)) \left(0.582879670292435000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right) = 0.0728158454836800000 - \frac{\pi^2}{24} - 0.5000000000000000000 (0.582879670292435000 + \log(2) + \log(\pi)) \left(-0.582879670292435000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right) + \log(1)\left(-1 + 2\sin^2\left(\frac{\pi}{2}\right)\right) + \frac{1}{2}\log(2)\left(-1 + 2\sin^2(\pi)\right)$$

$$0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435000 + \log(2\pi)) \left(0.582879670292435000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right) = 0.0728158454836800000 - \frac{\pi^2}{24} + \log(1) - 2\cos^2\left(\frac{\pi}{2}\right)\log(1) - \frac{1}{2}\left(-1 + 2\cos^2(\pi)\right)\log(2) - 0.5000000000000000000 (0.582879670292435000 + \log(2) + \log(\pi)) \left(-0.582879670292435000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)$$

$$0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435000 + \log(2\pi)) \left(0.582879670292435000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right) = 0.0728158454836800000 - \frac{\pi^2}{24} + \cos\left(\frac{\pi}{3}\right)\left(3 - 4\cos^2\left(\frac{\pi}{3}\right)\right)\log(1) + \frac{1}{2}\cos\left(\frac{2\pi}{3}\right)\left(3 - 4\cos^2\left(\frac{2\pi}{3}\right)\right)\log(2) - 0.5000000000000000000 (0.582879670292435000 + \log(2) + \log(\pi)) \left(-0.582879670292435000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)$$

-((311431943 π)/1149415279)/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi)))))))

Input interpretation:

$$-\left(\frac{311431943\pi}{1149415279} \Bigg/ \left(0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi))\left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)\right)\right)$$

log(x) is the natural logarithm

Result:

1.61804525500240...

1.6180452550024… result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternative representations:

$$-\left((311431943\pi) \Big/ \left(\left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi))\left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right) 1149415279\right)\right) =$$

$$-\left((311431943\pi) \Big/ \left(1149415279\left(0.0728158454836800000 + \frac{1}{2}(0.5828796702924350000 + \log(2\pi))\left(0.5828796702924350000 - \log\left(\frac{\pi}{2\cos(0)}\right)\right) - \frac{1}{2}\log(1)\left(e^{-i\pi} + e^{i\pi}\right) - \frac{1}{4}\log(2)\left(e^{-2i\pi} + e^{2i\pi}\right) - \frac{\pi^2}{24}\right)\right)\right)$$

$$-\left((311431943\,\pi)\Big/\left(\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.582879670292435000+\log(2\,\pi))\left(0.582879670292435000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)1149415279\right)\right)=$$

$$-\left((311431943\,\pi)\Big/\left(1149415279\left(0.0728158454836800000-\cosh(-i\,\pi)\log_e(1)-\frac{1}{2}\cosh(-2\,i\,\pi)\log_e(2)+\frac{1}{2}\,(0.582879670292435000+\log_e(2\,\pi))\left(0.582879670292435000-\log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)\right)$$

$$-\left((311431943\,\pi)\Big/\left(\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.582879670292435000+\log(2\,\pi))\left(0.582879670292435000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)1149415279\right)\right)=$$

$$-\left((311431943\,\pi)\Big/\left(1149415279\left(0.0728158454836800000-\cosh(i\,\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2\,i\,\pi)\log(a)\log_a(2)+\frac{1}{2}\,(0.582879670292435000+\log(a)\log_a(2\,\pi))\left(0.582879670292435000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)\right)$$

Integral representations:

$$-\left((311431943\,\pi)\Big/\left(\left(\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)1\,149\,415\,279\right)\right)\right)=$$

$$(6.5027555910886756\,i\,\pi^2)\Big/\left(-5.8245648120909328\,i\,\pi+1.00000000000000000\,i\,\pi^3+1.00000000000000000\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1}{\sqrt{s}}\,e^{-\pi^2/s+s}\left(12.0000000000000\,e^{(3\,\pi^2)/(4\,s)}\log(1)+6.0000000000000\log(2)\right)\sqrt{\pi}\;ds-6.9945560435092200\,i\,\pi\log(2\,\pi)+6.9945560435092200\,i\,\pi\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi\,t}{2}\right)dt}\right)+12.0000000000000000\,i\,\pi\log(2\,\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi\,t}{2}\right)dt}\right)\right)\quad\text{for }\gamma>0$$

$$-\left((311431943\,\pi)\Big/\left(\left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi))\left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right)1\,149\,415\,279\right)\right) =$$

$$(6.5027555910886756\,\pi)\Big/\left(-5.8245648120909328 + 1.0000000000000000\,\pi^2 - 24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right) \quad \text{for } \gamma > 0$$

$$-\left((311431943\,\pi)\Big/\left(\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)1\,149\,415\,279\right)\right)=$$

$$(6.5027555910886756\,\pi)\Big/\left(-5.8245648120909328+1.000000000000000000\,\pi^2+24.0000000000000000\log(1)-24.0000000000000000\,\pi\log(1)\int_0^1\sin(\pi\,t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\,\pi\log(2)\int_0^1\sin(2\,\pi\,t)\,dt-6.9945560435092200\log(2\,\pi)+6.9945560435092200\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-\pi^2/(16\,s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\,\pi)\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-\pi^2/(16\,s)+s}}{s^{3/2}}\,ds}\right)\right)\quad\text{for }\gamma>0$$

$$-\left((311431943\,\pi)\Big/\left(\left(\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)1\,149\,415\,279\right)\right)\right)=$$

$$(6.5027555910886756\,\pi)\Big/\left(-5.8245648120909328+1.0000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3\,t)\right)dt-6.9945560435092200\log(2\,\pi)+6.9945560435092200\log\left(\frac{i\,\pi^2}{\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{4^{-1+2\,s}\,\pi^{1-2\,s}\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\right)+12.0000000000000000\log(2\,\pi)\log\left(\frac{i\,\pi^2}{\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{4^{-1+2\,s}\,\pi^{1-2\,s}\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\right)\right)\quad\text{for } 0<\gamma<1$$

-16/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi))))))))

Input interpretation:

$$-\left(16\Big/\left(0.072815845483680-\frac{\pi^2}{24}+\frac{1}{2}\,(0.582879670292435+\log(2\,\pi))\left(0.582879670292435-\log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\,\pi\right)}\right)\right)-\left(\frac{\log(1)}{1}\cos(\pi)+\frac{\log(2)}{2}\cos(2\,\pi)\right)\right)\right)$$

$\log(x)$ is the natural logarithm

Result:

30.4140730492290...

30.41407304… result very near to the black hole entropy 30.4615

Alternative representations:

$$-\left(16\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)=$$

$$-\left(16\Big/\left(0.0728158454836800000+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)\right)$$

$$-\left(16\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)=$$

$$-\left(16\Big/\left(0.0728158454836800000-\cosh(-i\pi)\log_e(1)-\frac{1}{2}\cosh(-2i\pi)\log_e(2)+\frac{1}{2}(0.5828796702924350000+\log_e(2\pi))\left(0.5828796702924350000-\log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

$$-\left(16\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)=$$

$$-\left(16\Big/\left(0.0728158454836800000-\cosh(i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2i\pi)\log(a)\log_a(2)+\frac{1}{2}(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

Integral representations:

$$-\left(16\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)=$$

$$(384.00000000000000\,i\pi)\Big/\left(-5.8245648120909328\,i\pi+1.00000000000000000\,i\pi^3+1.00000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\sqrt{s}}e^{-\pi^2/s+s}\left(12.0000000000000\,e^{(3\pi^2)/(4s)}\log(1)+6.0000000000000\log(2)\right)\sqrt{\pi}\,ds-6.9945560435092200\,i\pi\log(2\pi)+6.9945560435092200\,i\pi\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\,i\pi\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\quad\text{for }\gamma>0$$

$$-\left(16\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\,\pi)\log(2)\right)\right)\right)=$$

$$384.00000000000000\Big/\left(-5.8245648120909328+1.0000000000000000\,\pi^2-24.000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3\,t)\right)dt-6.9945560435092200\log(2\,\pi)+6.9945560435092200\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-\pi^2/(16\,s)+s}}{s^{3/2}}\,ds}\right)+12.000000000000000\log(2\,\pi)\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-\pi^2/(16\,s)+s}}{s^{3/2}}\,ds}\right)\right)\quad\text{for }\gamma>0$$

$$-\left(16\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)=$$

$$384.00000000000000\Big/\Bigg(-5.8245648120909328+1.00000000000000000\,\pi^2+24.0000000000000000\log(1)-24.0000000000000000\,\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\,\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4\,i\,\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\Bigg)\quad\text{for }\gamma>0$$

$$-\left(16 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right) =$$

$$384.00000000000000 \Big/ \left(-5.8245648120909328 + 1.00000000000000000\,\pi^2 - 24.0000000000000000 \int_{\frac{\pi}{2}}^{\pi} \left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right) dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200 \log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right) + 12.0000000000000000 \log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right) \quad \text{for } 0 < \gamma < 1$$

10^39*(((-7/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi))))))))-18*1/10^2)))

Input interpretation:

$$10^{39}\left(-\left(7 \Big/ \left(0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi)) \left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)\right)\right) - 18 \times \frac{1}{10^2}\right)$$

log(x) is the natural logarithm

Result:

$1.31261569590377... \times 10^{40}$

1.31261569590377…*10^{40} result practically equal to the SMBH87 mass 1.312806*10^{40}

Alternative representations:

$$10^{39}\left(-\left(7\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=10^{39}\left(-\frac{18}{10^2}-7\Big/\left(0.0728158454836800000+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)\right)$$

$$10^{39}\left(-\left(7\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=10^{39}\left(-\frac{18}{10^2}-7\Big/\left(0.0728158454836800000-\cosh(-i\pi)\log_e(1)-\frac{1}{2}\cosh(-2i\pi)\log_e(2)+\frac{1}{2}(0.5828796702924350000+\log_e(2\pi))\left(0.5828796702924350000-\log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

$$10^{39}\left(-\left(7\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\,\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=$$

$$10^{39}\left(-\frac{18}{10^2}-7\Big/\left(0.0728158454836800000-\cosh(i\,\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2\,i\,\pi)\log(a)\log_a(2)+\frac{1}{2}\,(0.5828796702924350000+\log(a)\log_a(2\,\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

Integral representations:

$$10^{39}\left(-\left(7\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.582879670292435000+\log(2\pi))\left(0.582879670292435000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=$$

$$-\left(\left(1.8000000000000000\times10^{38}\left(-939.15789814542427+1.00000000000000000\,\pi^2-24.0000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2e^{(3\pi^2)/(4s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4i\pi\sqrt{s}}\,ds-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\right)\Big/\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2e^{(3\pi^2)/(4s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4i\pi\sqrt{s}}\,ds-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\right)\quad\text{for }\gamma>0$$

$$10^{39}\left(-\left(7\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=$$

$$-\left(\left(1.8000000000000000\times10^{38}\left(-939.15789814542427+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\Big/\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\quad\text{for }\gamma>0$$

$$10^{39}\left(-\left(7\middle/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=$$

$$-\left(\left(1.8000000000000000\times 10^{38}\left(-939.15789814542427+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\right)\middle/\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\right)\quad \text{for } 0<\gamma<1$$

$$10^{39}\left(-\left(7\Big/\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)\right)-\frac{18}{10^2}\right)=$$

$$-\left(\left(1.8000000000000000\times10^{38}\left(-939.15789814542427+1.00000000000000000\,\pi^2+24.0000000000000000\log(1)-24.0000000000000000\,\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\,\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\Big/\left(-5.8245648120909328+1.00000000000000000\,\pi^2+24.0000000000000000\log(1)-24.0000000000000000\,\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\,\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\quad\text{for }\gamma>0$$

We note that:

1.31261569e+40 ÷ 1989100000000000000000000000000 =

6.599.043.235,634206425 and the Supermassive Black Hole of M87 is about 6,6 billion of M⊙ (solar masses) , with a mass of 13.12806e+39. We have obtained:

(1.31261569e+40)/(1.9891e+30)

Input interpretation:

$$\frac{1.31261569\times 10^{40}}{1.9891\times 10^{30}}$$

Result:

$6.599043235634206425016339047810567593383942486551706 80\ldots \times 10^{9}$

$6.599043235634...*10^9 \approx 6.6 * 10^9$ solar masses

The Schwarzschild radius, obtained from the Hawking radiation calculator, is: $1.94973 * 10^{13}$

From the Ramanujan expression, we obtain also:

10^13*[1-((((1/2*1/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi)))))))))))]

Input interpretation:

$$10^{13}\left(1-\frac{1}{2}\times 1\Big/\left(0.072815845483680-\frac{\pi^2}{24}+\frac{1}{2}(0.582879670292435+\log(2\pi))\left(0.582879670292435-\log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right)-\left(\frac{\log(1)}{1}\cos(\pi)+\frac{\log(2)}{2}\cos(2\pi)\right)\right)\right)$$

log(x) is the natural logarithm

Result:

$1.95043978278841\ldots\times 10^{13}$

$1.9504397\ldots*10^{13}$ result practically equal to the SMBH87 radius $1.94973 * 10^{13}$

Alternative representations:

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=10^{13}$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)\right)\right)$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\cosh(-i\pi)\log_e(1)-\frac{1}{2}\cosh(-2i\pi)\log_e(2)+\frac{1}{2}(0.5828796702924350000+\log_e(2\pi))\left(0.5828796702924350000-\log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)\right)$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=10^{13}$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\cosh(i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2i\pi)\log(a)\log_a(2)+\frac{1}{2}(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)\right)$$

Integral representations:

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=$$

$$\left(1.00000000000000000\times10^{13}\left(6.1754351879090672+1.00000000000000000\,\pi^2-24.0000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2e^{(3\pi^2)/(4s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4i\pi\sqrt{s}}\,ds-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\right)\Big/$$

$$\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2e^{(3\pi^2)/(4s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4i\pi\sqrt{s}}\,ds-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\quad\text{for }\gamma>0$$

$$10^{13}\left(1-1\middle/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=$$

$$\left(1.00000000000000000\times 10^{13}\left(6.1754351879090672+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\middle/$$

$$\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\quad \text{for } \gamma>0$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=$$

$$\left(1.00000000000000000\times 10^{13}\left(6.1754351879090672+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\right)\Big/$$

$$\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\quad\text{for } 0<\gamma<1$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=$$

$$\left(1.00000000000000000\times 10^{13}\left(6.1754351879090672+1.00000000000000000\,\pi^2+24.0000000000000000\log(1)-24.0000000000000000\,\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\,\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\Big/$$

$$\left(-5.8245648120909328+1.00000000000000000\,\pi^2+24.0000000000000000\log(1)-24.0000000000000000\,\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\,\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=10\,000\,000\,000\,000$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}-0.5000000000000000000(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)+\log(1)\left(-1+2\sin^2\left(\frac{\pi}{2}\right)\right)+\frac{1}{2}\log(2)\left(-1+2\sin^2(\pi)\right)\right)\right)\right)$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=10\,000\,000\,000\,000$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\log(1)-2\cos^2\left(\frac{\pi}{2}\right)\log(1)-\frac{1}{2}\left(-1+2\cos^2(\pi)\right)\log(2)-0.5000000000000000000(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)\right)$$

$$10^{13}\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)=10\,000\,000\,000\,000$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\cos\left(\frac{\pi}{3}\right)\left(3-4\cos^2\left(\frac{\pi}{3}\right)\right)\log(1)+\frac{1}{2}\cos\left(\frac{2\pi}{3}\right)\left(3-4\cos^2\left(\frac{2\pi}{3}\right)\right)\log(2)-0.5000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)\right)$$

We note that:

10^13*[1-((((1/2*1/((((0.072815845483680 – (x/4) + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi)))))))))))] = 1.9504397827e+13

Input interpretation:

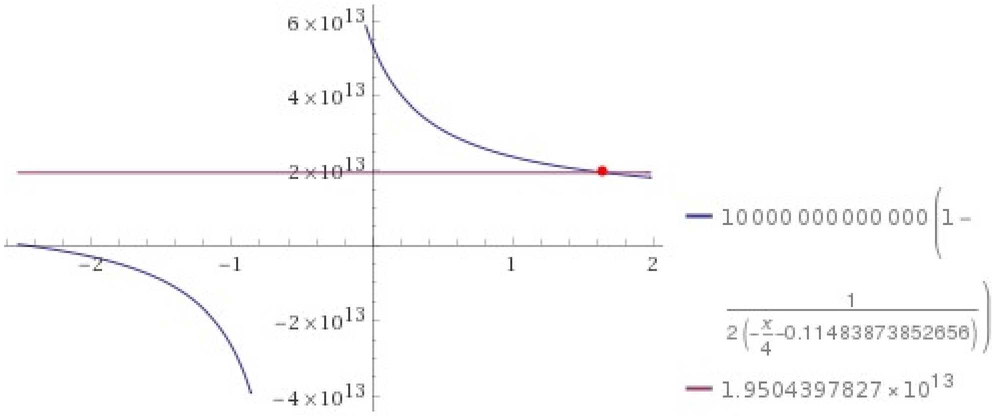
$$10^{13}\left(1-\frac{1}{2}\times 1\Big/\left(0.072815845483680-\frac{x}{4}+\frac{1}{2}(0.582879670292435+\log(2\pi))\left(0.582879670292435-\log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right)-\left(\frac{\log(1)}{1}\cos(\pi)+\frac{\log(2)}{2}\cos(2\pi)\right)\right)\right)=1.9504397827\times 10^{13}$$

log(x) is the natural logarithm

Result:

$$10\,000\,000\,000\,000\left(1-\frac{1}{2\left(-\frac{x}{4}-0.11483873852656\right)}\right)=1.9504397827\times 10^{13}$$

Plot:



Alternate form assuming x is real:

$$\frac{2.000000\times 10^{13}}{1.0000000\,x+0.4593550}=9.50440\times 10^{12}$$

Alternate forms:

$$\frac{1.0000000000000\times 10^{13}\,(x+2.4593549541062)}{x+0.45935495410625}=1.9504397827\times 10^{13}$$

$$\frac{1.0000000000000\times 10^{13}\,(1.0000000000000\,x+2.459354954106)}{1.0000000000000\,x+0.4593549541062}=1.9504397827\times 10^{13}$$

Alternate form assuming x is positive:

$9.504397827\times 10^{12}\,x=1.5634107772\times 10^{13}$ (for $x\neq -0.4593549541062$)

Expanded form:

$$10\,000\,000\,000\,000-\frac{5\,000\,000\,000\,000}{-\frac{x}{4}-0.11483873852656}=19\,504\,397\,827\,000$$

Solution:

$x\approx 1.644934067$

$1.644934067 = \zeta(2) = \frac{\pi^2}{6} = 1.644934 \ldots$

From:

$$\frac{1.0000000000000 \times 10^{13}\,(x + 2.4593549541062)}{x + 0.45935495410625} = 1.9504397827 \times 10^{13}$$

We have also:

(1.0000000000000×10^13 (x + 2.4593549541062+0.027))/(x + 0.45935495410625+0.027) = 1.9504397827×10^13

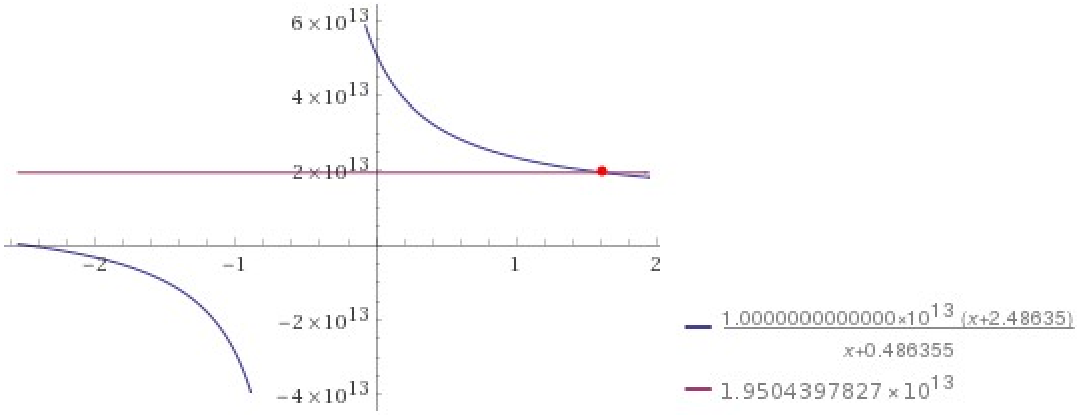
Input interpretation:

$$\frac{1.0000000000000 \times 10^{13}\,(x + 2.4593549541062 + 0.027)}{x + 0.45935495410625 + 0.027} = 1.9504397827 \times 10^{13}$$

Result:

$$\frac{1.0000000000000 \times 10^{13}\,(x + 2.48635)}{x + 0.486355} = 1.9504397827 \times 10^{13}$$

Plot:



Alternate form assuming x is real:

$$\frac{2. \times 10^{13}}{x + 0.486355} = 9.5044 \times 10^{12}$$

Alternate form:

$$\frac{1 \times 10^{13}\,x + 2.48635 \times 10^{13}}{x + 0.486355} = 1.9504397827 \times 10^{13}$$

Alternate form assuming x is positive:

$$9.5044 \times 10^{12}\,x = 1.53775 \times 10^{13}$$

Expanded form:

$$\frac{10\,000\,000\,000\,000\,x}{x + 0.486355} + \frac{2.48635 \times 10^{13}}{x + 0.486355} = 19\,504\,397\,827\,000$$

Alternate form assuming x>0:

$$\frac{1\times 10^{13}\, x + 2.48635\times 10^{13}}{x + 0.486355} = 1.9504397827\times 10^{13}$$

Solution:

$x \approx 1.61793$

1.61793 ≈ 1.61803398…. = golden ratio

The surface area of the SMBH87 is 4.77706 * 10^{27}. From the previous expression, we have:

10^27*[-(728)^1/3*((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi))))))))+(47-2)*1/10^3]

Input interpretation:

$$10^{27}\left(-\sqrt[3]{728}\left(0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi))\left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)\right) + (47-2)\times\frac{1}{10^3}\right)$$

log(x) is the natural logarithm

Result:

$4.77748440009457\ldots \times 10^{27}$

4.77748440009457…*10^{27}

Alternative representations:

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000+\frac{1}{2}\,(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)+\frac{45}{10^3}\right)$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000-\cosh(i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2i\pi)\log(a)\log_a(2)+\frac{1}{2}\,(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)+\frac{45}{10^3}\right)$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.07281584548368000000-\cosh(-i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(-2i\pi)\log(a)\log_a(2)+\frac{1}{2}(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)+\frac{45}{10^3}\right)$$

Integral representations:

$$10^{27}\left(-\sqrt[3]{728}\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$-2.13821262241638459\times10^{27}+3.74828453772951233\times10^{26}\pi^2+1.00000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(-8.9958828905508296\times10^{27}\log(1)\sin(t)-1.34938243358262444\times10^{28}\log(2)\sin(-\pi+3t)\right)dt-2.62175862661681234\times10^{27}\log(2\pi)+2.62175862661681234\times10^{27}\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+4.49794144527541480\times10^{27}\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$
$$-2.13821262241638459\times10^{27}+3.74828453772951233\times10^{26}\pi^2+1.00000000000000000\int_0^1\pi\left(-8.9958828905508296\times10^{27}\log(1)\sin(\pi t)-8.9958828905508296\times10^{27}\log(2)\sin(2\pi t)\right)dt+8.9958828905508296\times10^{27}\log(1)+4.49794144527541480\times10^{27}\log(2)-2.62175862661681234\times10^{27}\log(2\pi)+2.62175862661681234\times10^{27}\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+4.49794144527541480\times10^{27}\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$
$$-2.13821262241638459\times10^{27}+3.74828453772951233\times10^{26}\pi^2+1.00000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{i\pi\sqrt{s}}e^{-\pi^2/s+s}\left(4.49794144527541480\times10^{27}e^{(3\pi^2)/(4s)}\log(1)+2.24897072263770740\times10^{27}\log(2)\right)\sqrt{\pi}\,ds-2.62175862661681234\times10^{27}\log(2\pi)+2.62175862661681234\times10^{27}\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+4.49794144527541480\times10^{27}\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\quad\text{for }\gamma>0$$

Multiple-argument formulas:

$$10^{27}\left(-\sqrt[3]{728}\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$1\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(\frac{9}{200}-2\sqrt[3]{91}\left(0.07281584548368000000-\frac{\pi^2}{24}-0.50000000000000000000(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)+\log(1)\left(-1+2\sin^2\left(\frac{\pi}{2}\right)\right)+\frac{1}{2}\log(2)\left(-1+2\sin^2(\pi)\right)\right)\right)$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$1\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(\frac{9}{200}-2\sqrt[3]{91}\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2)+\log(\pi))\left(0.5828796702924350000-\log\left(\frac{1}{2}\right)-\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)-\log(1)\left(1-2\sin^2\left(\frac{\pi}{2}\right)\right)-\frac{1}{2}\log(2)\left(1-2\sin^2(\pi)\right)\right)\right)$$

$$10^{27}\left(-\sqrt[3]{728}\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\cos(\pi)\log(1)+\frac{1}{2}\cos(2\pi)\log(2)\right)\right)+\frac{47-2}{10^3}\right)=$$

$$1\,000\,000\,000\,000\,000\,000\,000\,000\,000\left(\frac{9}{200}-2\sqrt[3]{91}\left(0.0728158454836800000-\frac{\pi^2}{24}+\log(1)-2\cos^2\left(\frac{\pi}{2}\right)\log(1)-\frac{1}{2}\left(-1+2\cos^2(\pi)\right)\log(2)-0.5000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)$$

Now, we have that:

From

Traversable wormholes in *f*(R, T) gravity with conformal motions
Ayan Banerjee, Ksh. Newton Singh, M. K. Jasim,4 and Farook Rahaman -
arXiv:1908.04754v1 [gr-qc] 10 Aug 2019

Our aim here is to restrict the dimensions of these wormholes not to arbitrarily large. For this, the exterior Schwarzschild is given by

$$ds^2=-\left(1-\frac{2M}{r}\right)dt^2+\frac{dr^2}{\left(1-\frac{2M}{r}\right)}+r^2(d\theta^2+\sin^2\theta d\phi^2), \tag{28}$$

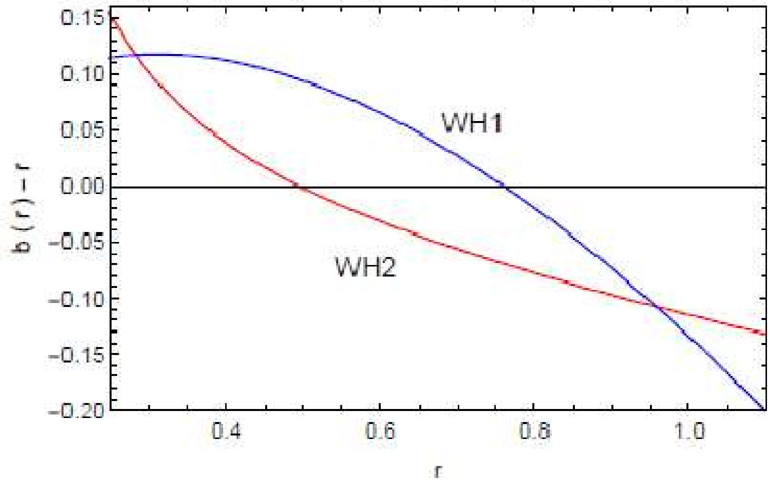


FIG. 3: Variation of $b(r) - r$ with $A = 1.23$, $\chi = -2$, $\omega = -2$, $c_3 = 7.74$ (WH1) and $B = -0.44$, $\chi = -2$, $n = -0.4$, $c_3 = -10$ (WH2).

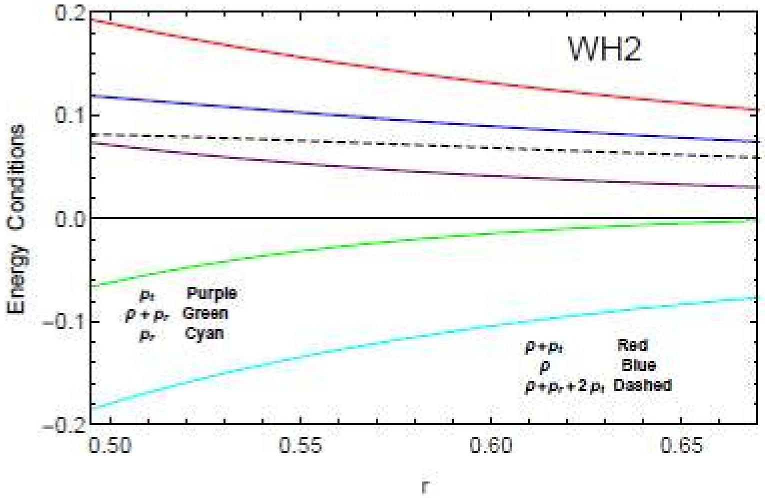


FIG. 6: Variation all the physical quantities and energy conditions with $B = -0.44$, $\chi = -2$, $n = -0.4$, $c_3 = -10$ for WH2.

The case of a isotropic wormhole i.e. when $p_r = p_t$ is particularly simple one, yet it provides enough interesting results [30]. In order to analyze solutions we shall now on take into consideration Eqs. (24) and (25), which yield

$$\psi(r) = \frac{1}{\sqrt{2\chi + 2\pi(\omega+3)}} \left\{ \exp\left[4\{\chi + \pi(\omega+3)\}\left(A + \frac{2\log r}{\chi - 3\chi\omega - 8\pi\omega}\right)\right] + C_3^2(\chi + 2\pi)(\omega+1) \right\}^{\frac{1}{2}}, \quad (36)$$

for A = 1.23, χ = -2, ω = - 2, r = 1.94973e+13, c_3 = 7.74 or -10, B = -0.44, n = -0.4

The Supermassive Black Hole of M87 is about 6,6 billion of M⊙ (solar masses) , with a mass of 13.12806e+39

$6.599043235634206425016339047810567593383942486551706 80... \times 10^9$

$6.599043235634...*10^9 \approx 6.6 * 10^9$ solar masses

The Schwarzschild radius is: $1.94973 * 10^{13}$

1/(-4+2Pi)^1/2*[exp(((((((4(-2+Pi)))*(1.23+((2ln(1.94973e+13)/((-2-3(4)-8Pi(-2)))))))))) + 7.74^2(-2+2Pi)*-1]^1/2

Input interpretation:

$$\frac{1}{\sqrt{-4+2\pi}} \sqrt{\exp\left((4(-2+\pi))\left(1.23 + 2\times\frac{\log(1.94973\times 10^{13})}{-2-3\times 4 - 8\pi\times(-2)}\right)\right) + 7.74^2 (-2+2\pi)\times(-1)}$$

log(x) is the natural logarithm

Result:

517.229...

517.229…

From the previous Ramanujan expression

$$0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi))\left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)$$

We have also:

-Pi^2*10^2*(((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi)))))))-2

Input interpretation:

$$-\pi^2\left(10^2\left(0.072815845483680-\frac{\pi^2}{24}+\frac{1}{2}(0.582879670292435+\log(2\pi))\left(0.582879670292435-\log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right)-\left(\frac{\log(1)}{1}\cos(\pi)+\frac{\log(2)}{2}\cos(2\pi)\right)\right)\right)-2$$

log(x) is the natural logarithm

Result:

517.212504559407...

517.212504559407…

Alternative representations:

$$-\pi^2\,10^2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)-2=$$

$$-2-10^2\,\pi^2\left(0.0728158454836800000+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)$$

$$-\pi^2\, 10^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}\,(0.5828796702924350000 + \log(2\,\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\,\pi)\right)\right) - 2 =$$

$$-2 - 10^2\,\pi^2 \left(0.0728158454836800000 - \cosh(i\,\pi)\log(a)\log_a(1) - \frac{1}{2}\cosh(2\,i\,\pi)\log(a)\log_a(2) + \frac{1}{2}\,(0.5828796702924350000 + \log(a)\log_a(2\,\pi)) \left(0.5828796702924350000 - \log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \frac{\pi^2}{24}\right)$$

$$-\pi^2\, 10^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}\,(0.5828796702924350000 + \log(2\,\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\,\pi)\right)\right) - 2 =$$

$$-2 - 10^2\,\pi^2 \left(0.0728158454836800000 - \cosh(-i\,\pi)\log(a)\log_a(1) - \frac{1}{2}\cosh(-2\,i\,\pi)\log(a)\log_a(2) + \frac{1}{2}\,(0.5828796702924350000 + \log(a)\log_a(2\,\pi)) \left(0.5828796702924350000 - \log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \frac{\pi^2}{24}\right)$$

Integral representations:

$$-\pi^2 \, 10^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right) - 2 =$$

$$4.16666666666666667 \left(-0.480000000000000000 - 5.82456481209093279\,\pi^2 + 1.00000000000000000\,\pi^4 + 0.240000000000000000 \int_{\frac{\pi}{2}}^{\pi} -50\,\pi^2 (2\log(1)\sin(t) + 3\log(2)\sin(-\pi + 3t))\,dt - 6.99455604350922000\,\pi^2 \log(2\pi) + 6.99455604350922000\,\pi^2 \log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right) + 12.0000000000000000\,\pi^2 \log(2\pi) \log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right)\right)$$

$$-\pi^2 \, 10^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right) - 2 =$$

$$4.16666666666666667 \left(-0.480000000000000000 - 5.82456481209093279\,\pi^2 + 1.00000000000000000\,\pi^4 + 0.240000000000000000 \int_0^1 -100\,\pi^3 (\log(1)\sin(\pi t) + \log(2)\sin(2\pi t))\,dt + 24.0000000000000000\,\pi^2 \log(1) + 12.0000000000000000\,\pi^2 \log(2) - 6.99455604350922000\,\pi^2 \log(2\pi) + 6.99455604350922000\,\pi^2 \log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right) + 12.0000000000000000\,\pi^2 \log(2\pi) \log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right)\right)$$

$$-\pi^2\, 10^2 \left(0.07281584548368000000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right) - 2 =$$

$$4.16666666666666667 \left(-0.480000000000000000 - 5.82456481209093279\,\pi^2 + 1.000000000000000000\,\pi^4 + 0.240000000000000000 \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{25\, e^{-\pi^2/s+s}\, \pi \left(2\, e^{(3\pi^2)/(4s)} \log(1) + \log(2)\right)\sqrt{\pi}}{i\sqrt{s}}\, ds - 6.99455604350922000\,\pi^2 \log(2\pi) + 6.99455604350922000\,\pi^2 \log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right) + 12.0000000000000000\,\pi^2 \log(2\pi) \log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right)\right) \text{ for } \gamma > 0$$

Multiple-argument formulas:

$$-\pi^2\, 10^2 \left(0.07281584548368000000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right) - 2 =$$

$$-2 - 100\,\pi^2 \left(0.07281584548368000000 - \frac{\pi^2}{24} - 0.5000000000000000000 (0.5828796702924350000 + \log(2) + \log(\pi)) \left(-0.5828796702924350000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right) + \log(1)\left(-1 + 2\sin^2\left(\frac{\pi}{2}\right)\right) + \frac{1}{2}\log(2)\left(-1 + 2\sin^2(\pi)\right)\right)$$

$$-\pi^2\, 10^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}\,(0.582879670292435000 + \log(2\,\pi)) \left(0.582879670292435000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\,\pi)\right)\right) - 2 =$$

$$-2 - 100\,\pi^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \log(1) - 2\cos^2\left(\frac{\pi}{2}\right)\log(1) - \frac{1}{2}\left(-1 + 2\cos^2(\pi)\right)\log(2) - 0.500000000000000000\,(0.582879670292435000 + \log(2) + \log(\pi)) \left(-0.582879670292435000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)$$

$$-\pi^2\, 10^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}\,(0.582879670292435000 + \log(2\,\pi)) \left(0.582879670292435000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\,\pi)\right)\right) - 2 =$$

$$-2 - 100\,\pi^2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \cos\left(\frac{\pi}{3}\right)\left(3 - 4\cos^2\left(\frac{\pi}{3}\right)\right)\log(1) + \frac{1}{2}\cos\left(\frac{2\,\pi}{3}\right)\left(3 - 4\cos^2\left(\frac{2\,\pi}{3}\right)\right)\log(2) - 0.500000000000000000\,(0.582879670292435000 + \log(2) + \log(\pi)) \left(-0.582879670292435000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)$$

Here, we investigate the wormhole solution for a particularly interesting anisotropy, already explored in [15, 33], given by

$$p_t = np_r, \tag{44}$$

where the state parameter n is a constant. With this assumption and solving the differential equations (33)-(35), as the same procedure for WH1, the function $\psi(r)$ takes the form

$$\psi(r) = \frac{1}{\sqrt{2n\chi + \pi(6n-2)}} \left[e^{4B\Omega} r^{\Lambda} ((n+3)\chi + 8\pi)^{\Lambda} + C_3^2 n(\chi + 2\pi) \right]^{1/2}, \tag{45}$$

where $\Lambda = \frac{8(n\chi+\pi(3n-1))}{(n+3)\chi+8\pi}$ and $\Omega = n\chi + \pi(3n-1)$.

for A = 1.23, χ = -2, ω = - 2, r = 1.94973e+13, c_3 = 7.74 or -10, B = -0.44, n = -0.4

-0.4(-2)+Pi((3*(-0.4)-1))

Input:

$-0.4 \times (-2) + \pi (3 \times (-0.4) - 1)$

Result:

-6.11150...

Ω = -6.11150…

(((8(-0.4*-2+Pi((3*-0.4)-1))))/(((-0.4+3)*-2+8Pi)))

Input:

$$\frac{8(-0.4 \times (-2) + \pi (3 \times (-0.4) - 1))}{(-0.4+3) \times (-2) + 8\pi}$$

Result:

-2.45285...

Λ = -2.45285…

Alternative representations:

$$\frac{8(-0.4(-2)+\pi(3(-0.4)-1))}{(-0.4+3)(-2)+8\pi} = \frac{8(0.8-396.°)}{-5.2+1440°}$$

$$\frac{8(-0.4(-2)+\pi(3(-0.4)-1))}{(-0.4+3)(-2)+8\pi} = \frac{8(0.8+2.2\,i\log(-1))}{-5.2-8\,i\log(-1)}$$

$$\frac{8(-0.4(-2)+\pi(3(-0.4)-1))}{(-0.4+3)(-2)+8\pi} = \frac{8\left(0.8-2.2\cos^{-1}(-1)\right)}{-5.2+8\cos^{-1}(-1)}$$

Series representations:

$$\frac{8(-0.4(-2)+\pi(3(-0.4)-1))}{(-0.4+3)(-2)+8\pi} = -\frac{2.2\left(-0.0909091+\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}\right)}{-0.1625+\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}$$

$$\frac{8(-0.4(-2)+\pi(3(-0.4)-1))}{(-0.4+3)(-2)+8\pi} = -\frac{2.2\left(-1.18182+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}\right)}{-1.325+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}}$$

$$\frac{8(-0.4(-2)+\pi(3(-0.4)-1))}{(-0.4+3)(-2)+8\pi} = -\frac{2.2\left(-0.363636+x+2\sum_{k=1}^{\infty}\frac{\sin(kx)}{k}\right)}{-0.65+x+2\sum_{k=1}^{\infty}\frac{\sin(kx)}{k}}$$

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

Now, we have:

1/((((2*(-0.4)(-2)+Pi((6(-0.4)-2))))))^1/2

Input:

$$\frac{1}{\sqrt{2\times(-0.4)\times(-2)+\pi(6\times(-0.4)-2)}}$$

Result:

$-0.286030\ldots\,i$

Polar coordinates:

$r = 0.28603$ (radius), $\theta = -90°$ (angle)

0.28603

$$\psi(r) = \frac{1}{\sqrt{2n\chi + \pi(6n-2)}}\left[e^{4B\Omega}r^{\Lambda}((n+3)\chi + 8\pi)^{\Lambda} + C_3^2 n(\chi + 2\pi)\right]^{1/2}, \qquad (45)$$

for A = 1.23, χ = -2, ω = - 2, r = 1.94973e+13, c_3 = 7.74 or -10, B = -0.44, n = -0.4

Ω = -6.11150… Λ = -2.45285…

0.28603*[e^(4*-0.44*-6.11150) * (1.94973e+13)^(-2.45285) * ((((-0.4+3)*(-2)+8Pi))^(-2.45285)))+7.74^2*-0.4(-2+2Pi)]

Input interpretation:

$$0.28603\left(\frac{e^{4\times(-0.44)\times(-6.11150)}}{(1.94973\times 10^{13})^{2.45285}\,((-0.4+3)\times(-2)+8\,\pi)^{2.45285}} + 7.74^2\times(-0.4)\,(-2+2\,\pi)\right)$$

Result:

-29.3576…

-29.3576…

From the previous Ramanujan expression

$$0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}\,(0.582879670292435 + \log(2\,\pi))\left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\,\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\,\pi)\right)$$

We have also:

18/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi))))))))+5

Input interpretation:

$$18 \Big/ \left(0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2} (0.582879670292435 + \log(2\pi)) \left(0.582879670292435 - \log\left(\frac{\pi}{2 \sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1} \cos(\pi) + \frac{\log(2)}{2} \cos(2\pi)\right)\right) + 5$$

log(x) is the natural logarithm

Result:

−29.215832180383...

-29.215832180383

Alternative representations:

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi) \log(1) + \frac{1}{2} \cos(2\pi) \log(2)\right)\right) + 5 =$$

$$5 + 18 \Big/ \left(0.0728158454836800000 + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \cos(0)}\right)\right) - \frac{1}{2} \log(1) \left(e^{-i\pi} + e^{i\pi}\right) - \frac{1}{4} \log(2) \left(e^{-2i\pi} + e^{2i\pi}\right) - \frac{\pi^2}{24}\right)$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$5 + 18 \Big/ \left(0.0728158454836800000 - \cosh(-i\pi)\log_e(1) - \frac{1}{2}\cosh(-2i\pi)\log_e(2) + \frac{1}{2}(0.5828796702924350000 + \log_e(2\pi)) \left(0.5828796702924350000 - \log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \frac{\pi^2}{24}\right)$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$5 + 18 \Big/ \left(0.0728158454836800000 - \cosh(i\pi)\log(a)\log_a(1) - \frac{1}{2}\cosh(2i\pi)\log(a)\log_a(2) + \frac{1}{2}(0.5828796702924350000 + \log(a)\log_a(2\pi)) \left(0.5828796702924350000 - \log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \frac{\pi^2}{24}\right)$$

Integral representations:

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$\left(5.0000000000000000 \left(-92.224564812090933\, i\pi + 1.00000000000000000\, i\pi^3 + 1.00000000000000000 \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1}{\sqrt{s}} e^{-\pi^2/s+s} \left(12.0000000000000\, e^{(3\pi^2)/(4s)} \log(1) + 6.0000000000000 \log(2)\right) \sqrt{\pi}\, ds - 6.9945560435092200\, i\pi\log(2\pi) + 6.9945560435092200\, i\pi\log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right) + 12.0000000000000000\, i\pi\log(2\pi)\log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right)\right)\right) \Big/ \left(-5.8245648120909328\, i\pi + 1.00000000000000000\, i\pi^3 + 1.00000000000000000 \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{1}{\sqrt{s}} e^{-\pi^2/s+s} \left(12.0000000000000\, e^{(3\pi^2)/(4s)} \log(1) + 6.0000000000000 \log(2)\right) \sqrt{\pi}\, ds - 6.9945560435092200\, i\pi\log(2\pi) + 6.9945560435092200\, i\pi\log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right) + 12.0000000000000000\, i\pi\log(2\pi)\log\left(\frac{1}{\int_0^1 \cos\left(\frac{\pi t}{2}\right) dt}\right)\right) \quad \text{for } \gamma > 0$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$\left(5.0000000000000000 \left(-92.224564812090933 + 1.00000000000000000\,\pi^2 - 24.0000000000000000 \int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right)\right)\right) \Big/$$

$$\left(-5.8245648120909328 + 1.00000000000000000\,\pi^2 - 24.0000000000000000 \int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right)\right) \quad \text{for } \gamma > 0$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$\left(5.0000000000000000 \left(-92.224564812090933 + 1.0000000000000000\,\pi^2 - 24.0000000000000000 \int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\right) \Big/$$

$$\left(-5.8245648120909328 + 1.0000000000000000\,\pi^2 - 24.0000000000000000 \int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right) \quad \text{for } 0 < \gamma < 1$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$\left(5.0000000000000000 \left(-92.224564812090933 + 1.0000000000000000\,\pi^2 + 24.0000000000000000\log(1) - 24.0000000000000000\,\pi\log(1)\int_0^1 \sin(\pi t)\,dt + 12.0000000000000000\log(2) - 24.0000000000000000\,\pi\log(2)\int_0^1 \sin(2\pi t)\,dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right)\right)\right) \Big/$$

$$\left(-5.8245648120909328 + 1.0000000000000000\,\pi^2 + 24.0000000000000000\log(1) - 24.0000000000000000\,\pi\log(1)\int_0^1 \sin(\pi t)\,dt + 12.0000000000000000\log(2) - 24.0000000000000000\,\pi\log(2)\int_0^1 \sin(2\pi t)\,dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{4 i \pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right)\right) \quad \text{for } \gamma > 0$$

Multiple-argument formulas:

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi) \log(1) + \frac{1}{2} \cos(2\pi) \log(2)\right)\right) + 5 =$$

$$5 + 18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} - 0.5000000000000000000 (0.5828796702924350000 + \log(2) + \log(\pi)) \left(-0.5828796702924350000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right) + \log(1) \left(-1 + 2 \sin^2\left(\frac{\pi}{2}\right)\right) + \frac{1}{2} \log(2) \left(-1 + 2 \sin^2(\pi)\right)\right)$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi) \log(1) + \frac{1}{2} \cos(2\pi) \log(2)\right)\right) + 5 =$$

$$5 + 18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \log(1) - 2 \cos^2\left(\frac{\pi}{2}\right) \log(1) - \frac{1}{2} \left(-1 + 2 \cos^2(\pi)\right) \log(2) - 0.5000000000000000000 (0.5828796702924350000 + \log(2) + \log(\pi)) \left(-0.5828796702924350000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)$$

$$18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\cos(\pi)\log(1) + \frac{1}{2}\cos(2\pi)\log(2)\right)\right) + 5 =$$

$$5 + 18 \Big/ \left(0.0728158454836800000 - \frac{\pi^2}{24} + \cos\left(\frac{\pi}{3}\right)\left(3 - 4\cos^2\left(\frac{\pi}{3}\right)\right)\log(1) + \frac{1}{2}\cos\left(\frac{2\pi}{3}\right)\left(3 - 4\cos^2\left(\frac{2\pi}{3}\right)\right)\log(2) - 0.5000000000000000000\,(0.5828796702924350000 + \log(2) + \log(\pi)) \left(-0.5828796702924350000 + \log\left(\frac{1}{2}\right) + \log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)$$

Now, we have that:

$$I_V(WH1) = \left[a\left(1 - \frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1 - b/a}\right)\right] - \left[\frac{r(\chi + 2\pi)(\omega + 1)}{\zeta} - \frac{(\chi + 4\pi)(\omega + 1)e^{4A\zeta}}{C_3^2\zeta[8\pi - \chi(\omega - 3)]} r^{q/p} - \frac{r\left[e^{4A\zeta}r^{-\sigma} + C_3^2(\chi + 2\pi)(\omega + 1)\right]}{2C_3^2\zeta} \log\left(\frac{2C_2^2C_3^2\zeta r^2}{e^{4A\zeta}r^{-\sigma} + C_3^2(\chi + 2\pi)(\omega + 1)}\right)\right]_{r_0}^{a} \quad (53)$$

$$I_V(WH2) = \left[a\left(1 - \frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1 - b/a}\right)\right] - \left[\left\{\frac{2(n-1)(\chi + 4\pi)e^{4B\Omega}r^{\Sigma}}{(3n\chi + 8\pi n + \chi)[(n+3)\chi + 8\pi]^{-\Sigma}} - 2C_3^2nr(\chi + 2\pi)[(n+3)\chi + 8\pi] + \left(e^{4B\Omega}[(n+3)\chi + 8\pi]^{\Lambda}r^{\tau} + C_3^2n(\chi + 2\pi)\right) \log\left[\frac{2C_2^2C_3^2r^2\{n\chi + \pi(3n-1)\}}{e^{4B\Omega}r^{\Lambda}[(n+3)\chi + 8\pi]^{\Lambda} + C_3^2n(\chi + 2\pi)}\right]\right\} \left[\frac{2C_3^2\{n\chi + \pi(3n-1)\}}{\{(n+3)\chi + 8\pi\}^{-1}}\right]^{-1}\right]_{r_0}^{a}, \quad (54)$$

where $\tau = \frac{8\Omega}{(n+3)\chi + 8\pi}$. It is interesting to note that when

For

A = 1.23, χ = -2, ω = - 2, r = 1.94973e+13, c_3 = 7.74 or -10, B = -0.44, n = -0.4

Ω = -6.11150… Λ = -2.45285…

We have also:

$$\zeta = \chi + \pi(\omega + 3) \; ; \; \sigma = \frac{8\zeta}{\chi(3\omega - 1) + 8\pi\omega}$$
$$\eta = C_3^2(\chi + 2\pi)(\omega + 1) \; ; \; p = -3\chi\omega + \chi - 8\pi\omega$$
$$q = 3[8\pi - \chi(\omega - 3)].$$

-2+Pi(-2+3)

Input:

$-2 + \pi$

Decimal approximation:

1.141592653589793238462643383279502884197169399375105820974...

Property:

$-2 + \pi$ is a transcendental number

ζ = 1.141592653589..

-3(-2)(-2)+(-2)-(-2*8Pi)

Input:

$-3 \times (-2) \times (-2) - 2 - -2 \times 8\,\pi$

Result:

$16\,\pi - 14$

Decimal approximation:

36.265482457436691815402294132472046147154710390001693135 59...

p = 36.265482457....

3((((8Pi-(-2)(-2-3)))))

Input:

$3(8\pi - -2(-2-3))$

Result:

$3(8\pi - 10)$

Decimal approximation:

45.398223686155037723103441198708069220732065585002539703 39...

q = 45.398223686…

Property:

$3(-10 + 8\pi)$ is a transcendental number

((8*1.141592653589))/(((-2(3*(-2)-1)+(8Pi*(-2)))))

Input interpretation:

$$\frac{8\times 1.141592653589}{-2(3\times(-2)-1)+8\pi\times(-2)}$$

Result:

-0.2518301318459…

σ = -0.2518301318459…

Alternative representations:

$$\frac{8\times 1.1415926535890000}{-2(3(-2)-1)+8\pi(-2)} = \frac{9.1327412287120000}{14-2880^\circ}$$

$$\frac{8\times 1.1415926535890000}{-2(3(-2)-1)+8\pi(-2)} = \frac{9.1327412287120000}{14+16\,i\log(-1)}$$

$$\frac{8\times 1.1415926535890000}{-2(3(-2)-1)+8\pi(-2)} = \frac{9.1327412287120000}{14-16\cos^{-1}(-1)}$$

Series representations:

$$\frac{8 \times 1.1415926535890000}{-2(3(-2)-1)+8\pi(-2)} = -\frac{0.1426990816986250}{-0.2187500000000000 + 1.000000000000000 \sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\frac{8 \times 1.1415926535890000}{-2(3(-2)-1)+8\pi(-2)} = -\frac{0.2853981633972500}{-1.437500000000000 + 1.000000000000000 \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\frac{8 \times 1.1415926535890000}{-2(3(-2)-1)+8\pi(-2)} = -\left(0.5707963267945000 \Big/ \left(-0.875000000000000 + 1.000000000000000\, x + 2.000000000000000 \sum_{k=1}^{\infty} \frac{\sin(k\,x)}{k}\right)\right) \text{ for } (x \in \mathbb{R} \text{ and } x > 0)$$

For $A = 1.23$, $\chi = -2$, $\omega = -2$, $r = 1.94973e+13$, $c_3 = 7.74$ or -10, $B = -0.44$, $n = -0.4$

$\zeta = 1.141592653589..$ $p = 36.265482457....$ $q = 45.398223686…$ $a = 2$, $b = 3$,

$b(a) = 5$, $\nu(a) = 8$

$$I_V(WH1) = \left[a\left(1-\frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1-b/a}\right)\right] - \left[\frac{r(\chi+2\pi)(\omega+1)}{\zeta} - \frac{(\chi+4\pi)(\omega+1)e^{4A\zeta}}{C_3^2\zeta[8\pi-\chi(\omega-3)]} r^{q/p} - \frac{r\left[e^{4A\zeta}r^{-\sigma}+C_3^2(\chi+2\pi)(\omega+1)\right]}{2C_3^2\zeta} \log\left(\frac{2C_2^2C_3^2\zeta r^2}{e^{4A\zeta}r^{-\sigma}+C_3^2(\chi+2\pi)(\omega+1)}\right)\right]_{r_0}^{a} \quad (53)$$

((2(1-(5/2) ln((e^8)/(1-1.5)))) – (((1.94973e+13(-2+2Pi)(-1)/(1.141592653589))) – ((((-2+4Pi)(-2+1)*exp(4*1.23*1.141592653589))) / (((7.74^2*1.141592653589*(((8Pi-(-2)((-2-3)))))

Input interpretation:

$$\left(2\left(1-\frac{5}{2}\right)\right)\log\left(\frac{e^8}{1-1.5}\right)-\frac{1.94973\times 10^{13}\,(-2+2\,\pi)\times(-1)}{1.141592653589}-\frac{(-2+4\,\pi)\,(-2+1)\exp(4\times 1.23\times 1.141592653589)}{7.74^2\times 1.141592653589\,(8\,\pi--2\,(-2-3))}$$

log(x) is the natural logarithm

Result:

$7.31527\ldots\times 10^{13} - 9.42478\ldots\, i$

Polar coordinates:

$r = 7.31527\times 10^{13}$ (radius), $\theta = -7.38182\times 10^{-12}{}^\circ$ (angle)

$7.31527*10^{13}$

(1.94973e+13)^(1.25183)-1.94973e+13(((exp(4*1.23*1.141592653589)*((1.94973e+13)^(-0.25183))+7.74^2(-2+2Pi)(-1)))) * 1/(2*7.74^2*1.141592653589)

Input interpretation:

$$(1.94973\times 10^{13})^{1.25183}-1.94973\times 10^{13}\left(\frac{\exp(4\times 1.23\times 1.141592653589)}{(1.94973\times 10^{13})^{0.25183}}+7.74^2\,(-2+2\,\pi)\times(-1)\right)\times\frac{1}{2\times 7.74^2\times 1.141592653589}$$

Result:

$4.33666\ldots\times 10^{16}$

$4.33666\ldots*10^{16}$

ln(((((((2*(-10)^2*(7.74)^2*1.141592653589*(1.94973e+13)^2))) / (((exp(4*1.23*1.141592653589)*((1.94973e+13)^(-0.25183)))+7.74^2(-2+2Pi)(-1)))))))

Input interpretation:

$$\log\left(\frac{2\,(-10)^2\times 7.74^2\times 1.141592653589\,(1.94973\times 10^{13})^2}{\frac{\exp(4\times 1.23\times 1.141592653589)}{(1.94973\times 10^{13})^{0.25183}}+7.74^2\,(-2+2\,\pi)\times(-1)}\right)$$

log(x) is the natural logarithm

Result:

65.17912... +
3.141593... i

Polar coordinates:

$r = 65.2548$ (radius), $\theta = 2.75948°$ (angle)

65.2548

In conclusion:

[(((1.94973e+13(-2+2Pi)(-1)/(1.14159265)))) – (((-2+4Pi)(-2+1)*exp(4*1.23*1.14159265))) 1/ ((7.74^2*1.14159265*(((8Pi-(-2)((-2-3))))))) * (((4.33666e+16 * 65.2548)))]

Input interpretation:

$$\frac{1.94973\times 10^{13}\,(-2+2\,\pi)\times(-1)}{1.14159265}-((-2+4\,\pi)\,(-2+1)\exp(4\times 1.23\times 1.14159265))$$
$$\left(\frac{1}{7.74^2\times 1.14159265\,(8\,\pi--2\,(-2-3))}\left(4.33666\times 10^{16}\times 65.2548\right)\right)$$

Result:

$7.94425...\times 10^{18}$

$7.94425...*10^{18}$

((2(1-(5/2)) ln((e^8)/(1-1.5)))) – 7.94425 × 10^18

Input interpretation:

$$2\left(1-\frac{5}{2}\right)\log\left(\frac{e^8}{1-1.5}\right)-7.94425\times 10^{18}$$

log(x) is the natural logarithm

Result:

$$-7.94425\ldots\times 10^{18} - 9.42478\ldots i$$

Polar coordinates:

$r = 7.94425\times 10^{18}$ (radius), $\theta = -180°$ (angle)

$7.94425*10^{18}$

Or:

((2(1-(5/2)) ln((e^8)/(1-1.5)))) – [((1.94973e+13(-2+2Pi)(-1)/(1.14159265))) – (((-2+4Pi)(-2+1)*exp(4*1.23*1.14159265))) 1/ (((7.74^2*1.14159265*(((8Pi-(-2)((-2-3)))))))) * 4.33666e+16 * 65.2548]

Input interpretation:

$$2\left(1-\frac{5}{2}\right)\log\left(\frac{e^8}{1-1.5}\right)-\left(\frac{1.94973\times 10^{13}(-2+2\pi)\times(-1)}{1.14159265}-((-2+4\pi)(-2+1)\exp(4\times 1.23\times 1.14159265))\left(\frac{1}{7.74^2\times 1.14159265(8\pi--2(-2-3))}\times 4.33666\times 10^{16}\times 65.2548\right)\right)$$

log(x) is the natural logarithm

Result:

$$-7.94425\ldots\times 10^{18} - 9.42478\ldots i$$

Alternate form:

$$-7.94425\times 10^{18}$$

$-7.94425*10^{18}$

From which:

(-(-7.94425×10^18))^1/64

Input interpretation:

$$\sqrt[64]{-(-7.94425\times 10^{18})}$$

Result:

1.973846275977010227120406460768144245828246545838693070676...

1.973846275977...

From the Ramanujan expression

$$0.072815845483680-\frac{\pi^2}{24}+\frac{1}{2}(0.582879670292435+\log(2\pi))\left(0.582879670292435-\log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right)-\left(\frac{\log(1)}{1}\cos(\pi)+\frac{\log(2)}{2}\cos(2\pi)\right)$$

we obtain also:

[1-((((1/2*1/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi)))))))))))]+(21+2)*1/10^3

Input interpretation:

$$\left(1-\frac{1}{2}\times 1\Big/\left(0.072815845483680-\frac{\pi^2}{24}+\frac{1}{2}(0.582879670292435+\log(2\pi))\left(0.582879670292435-\log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right)-\left(\frac{\log(1)}{1}\cos(\pi)+\frac{\log(2)}{2}\cos(2\pi)\right)\right)\right)+(21+2)\times\frac{1}{10^3}$$

$\log(x)$ is the natural logarithm

Result:

1.97343978278841...

1.97343978278841...

Alternative representations:

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=1+\frac{23}{10^3}-1\Big/\left(2\left(0.0728158454836800000+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)\right)$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=1+\frac{23}{10^3}-1\Big/\left(2\left(0.0728158454836800000-\cosh(-i\pi)\log_e(1)-\frac{1}{2}\cosh(-2i\pi)\log_e(2)+\frac{1}{2}(0.5828796702924350000+\log_e(2\pi))\left(0.5828796702924350000-\log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

$$\left(1 - 1 \Big/ \left(2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right) + \frac{21+2}{10^3} =$$

$$1 + \frac{23}{10^3} - 1 \Big/ \left(2 \left(0.0728158454836800000 - \cosh(i\pi)\log(a)\log_a(1) - \frac{1}{2}\cosh(2i\pi) \log(a)\log_a(2) + \frac{1}{2}(0.5828796702924350000 + \log(a)\log_a(2\pi)) \left(0.5828796702924350000 - \log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \frac{\pi^2}{24}\right)\right)$$

Integral representations:

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=$$

$$\left(1.0230000000000000\left(5.9056404665014426\,i\pi+1.0000000000000000\,i\pi^3+1.0000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\sqrt{s}}e^{-\pi^2/s+s}\left(12.0000000000000\,e^{(3\pi^2)/(4s)}\log(1)+6.0000000000000\log(2)\right)\sqrt{\pi}\,ds-6.9945560435092200\,i\pi\log(2\pi)+6.9945560435092200\,i\pi\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.000000000000000\,i\pi\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\right)\Big/$$

$$\left(-5.8245648120909328\,i\pi+1.00000000000000000\,i\pi^3+1.00000000000000000\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\sqrt{s}}e^{-\pi^2/s+s}\left(12.0000000000000\,e^{(3\pi^2)/(4s)}\log(1)+6.0000000000000\log(2)\right)\sqrt{\pi}\,ds-6.9945560435092200\,i\pi\log(2\pi)+6.9945560435092200\,i\pi\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\,i\pi\log(2\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\quad\text{for }\gamma>0$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=$$

$$\Bigg(1.02300000000000000\Bigg(5.9056404665014426+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\Bigg)\Bigg)\Big/$$

$$\Bigg(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\Bigg)\quad \text{for } \gamma>0$$

$$\left(1 - 1\Big/\left(2\left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2}(0.5828796702924350000 + \log(2\pi))\left(0.5828796702924350000 - \log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1)\cos(\pi) + \frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right) + \frac{21+2}{10^3} =$$

$$\left(1.02300000000000000\left(5.9056404665014426 + 1.00000000000000000\,\pi^2 - 24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\right)\right)\right)\Big/$$

$$\left(-5.8245648120909328 + 1.00000000000000000\,\pi^2 - 24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t) + \frac{3}{2}\log(2)\sin(-\pi + 3t)\right)dt - 6.9945560435092200\log(2\pi) + 6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\right) + 12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds}\right)\right) \quad \text{for } 0 < \gamma < 1$$

$$\left(1 - 1 \Big/ \left(2 \left(0.0728158454836800000 - \frac{\pi^2}{24} + \frac{1}{2} (0.5828796702924350000 + \log(2\pi)) \left(0.5828796702924350000 - \log\left(\frac{\pi}{2 \sin\left(\frac{\pi}{2}\right)}\right)\right) - \left(\log(1) \cos(\pi) + \frac{1}{2} \log(2) \cos(2\pi)\right)\right)\right)\right) + \frac{21 + 2}{10^3} =$$

$$\left(1.02300000000000000 \left(5.9056404665014426 + 1.00000000000000000\,\pi^2 + 24.0000000000000000 \log(1) - 24.0000000000000000\,\pi \log(1) \int_0^1 \sin(\pi t)\,dt + 12.0000000000000000 \log(2) - 24.0000000000000000\,\pi \log(2) \int_0^1 \sin(2\pi t)\,dt - 6.9945560435092200 \log(2\pi) + 6.9945560435092200 \log\left(\frac{4 i \pi}{\sqrt{\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000 \log(2\pi) \log\left(\frac{4 i \pi}{\sqrt{\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right)\right)\right) \Big/$$

$$\left(-5.8245648120909328 + 1.00000000000000000\,\pi^2 + 24.0000000000000000 \log(1) - 24.0000000000000000\,\pi \log(1) \int_0^1 \sin(\pi t)\,dt + 12.0000000000000000 \log(2) - 24.0000000000000000\,\pi \log(2) \int_0^1 \sin(2\pi t)\,dt - 6.9945560435092200 \log(2\pi) + 6.9945560435092200 \log\left(\frac{4 i \pi}{\sqrt{\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right) + 12.0000000000000000 \log(2\pi) \log\left(\frac{4 i \pi}{\sqrt{\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-\pi^2/(16 s)+s}}{s^{3/2}}\,ds}\right)\right) \quad \text{for } \gamma > 0$$

Multiple-argument formulas:

$$\left(1-1\Big/\left(2\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=$$

$$\frac{1023}{1000}-1\Big/\left(2\left(0.07281584548368000000-\frac{\pi^2}{24}-0.50000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)+\log(1)\left(-1+2\sin^2\left(\frac{\pi}{2}\right)\right)+\frac{1}{2}\log(2)\left(-1+2\sin^2(\pi)\right)\right)\right)$$

$$\left(1-1\Big/\left(2\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=$$

$$\frac{1023}{1000}-1\Big/\left(2\left(0.07281584548368000000-\frac{\pi^2}{24}+\log(1)-2\cos^2\left(\frac{\pi}{2}\right)\log(1)-\frac{1}{2}\left(-1+2\cos^2(\pi)\right)\log(2)-0.50000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)$$

$$\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)+\frac{21+2}{10^3}=$$

$$\frac{1023}{1000}-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\cos\left(\frac{\pi}{3}\right)\left(3-4\cos^2\left(\frac{\pi}{3}\right)\right)\log(1)+\frac{1}{2}\cos\left(\frac{2\pi}{3}\right)\left(3-4\cos^2\left(\frac{2\pi}{3}\right)\right)\log(2)-0.5000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)$$

Now, we have that:

$$I_V(WH2)=\left[a\left(1-\frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1-b/a}\right)\right]-\left[\left\{\frac{2(n-1)(\chi+4\pi)e^{4B\Omega}r^{\Sigma}}{(3n\chi+8\pi n+\chi)[(n+3)\chi+8\pi]^{-\Sigma}}-2C_3^2nr(\chi+2\pi)[(n+3)\chi+8\pi]+\left(e^{4B\Omega}[(n+3)\chi+8\pi]^{\Lambda}r^{\tau}+C_3^2n(\chi+2\pi)\right)\log\left[\frac{2C_2^2C_3^2r^2\{n\chi+\pi(3n-1)\}}{e^{4B\Omega}r^{\Lambda}[(n+3)\chi+8\pi]^{\Lambda}+C_3^2n(\chi+2\pi)}\right]\right\}\left[\frac{2C_3^2\{n\chi+\pi(3n-1)\}}{\{(n+3)\chi+8\pi\}^{-1}}\right]^{-1}\right]_{r_0}^{a}, \quad (54)$$

where $\tau=\frac{8\Omega}{(n+3)\chi+8\pi}$

For A = 1.23, χ = -2, ω = - 2, r = 1.94973e+13, c_3 = 7.74 or -10, B = -0.44, n = -0.4

Ω = -6.11150… Λ = -2.45285… τ = -2.45285

((8*(-6.11150))) / (((-0.4+3)*(-2)+8Pi))

Input interpretation:

$$\frac{8\times(-6.11150)}{(-0.4+3)\times(-2)+8\pi}$$

Result:

$-2.45285\ldots$

-2.45285…

Alternative representations:

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{48.892}{-5.2+1440°}$$

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{48.892}{-5.2-8\,i\log(-1)}$$

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{48.892}{-5.2+8\cos^{-1}(-1)}$$

Series representations:

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{1.52788}{-0.1625+\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}}$$

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{3.05575}{-1.325+\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}}$$

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{6.1115}{-0.65+x+2\sum_{k=1}^{\infty}\frac{\sin(kx)}{k}} \quad \text{for } (x\in\mathbb{R} \text{ and } x>0)$$

Integral representations:

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{3.05575}{-0.325+\int_0^{\infty}\frac{1}{1+t^2}\,dt}$$

$$\frac{8(-6.1115)}{(-0.4+3)(-2)+8\pi} = -\frac{1.52788}{-0.1625+\int_0^1\sqrt{1-t^2}\,dt}$$

$$\frac{8\,(-6.1115)}{(-0.4+3)\,(-2)+8\,\pi} = -\frac{3.05575}{-0.325+\int_0^\infty \frac{\sin(t)}{t}\,dt}$$

From

$$\begin{aligned} I_V(WH2) = {} & \left[a\left(1-\frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1-b/a}\right)\right] - \\ & \left[\left\{\frac{2(n-1)(\chi+4\pi)e^{4B\Omega}r^{\Sigma}}{(3n\chi+8\pi n+\chi)[(n+3)\chi+8\pi]^{-\Sigma}}\right.\right. \\ & -2C_3^2 nr(\chi+2\pi)[(n+3)\chi+8\pi] + \\ & \left(e^{4B\Omega}[(n+3)\chi+8\pi]^{\Lambda}r^{\tau}+C_3^2 n(\chi+2\pi)\right) \\ & \log\left[\frac{2C_2^2C_3^2r^2\{n\chi+\pi(3n-1)\}}{e^{4B\Omega}r^{\Lambda}[(n+3)\chi+8\pi]^{\Lambda}+C_3^2n(\chi+2\pi)}\right]\Bigg\} \\ & \left.\left[\frac{2C_3^2\{n\chi+\pi(3n-1)\}}{\{(n+3)\chi+8\pi\}^{-1}}\right]^{-1}\right]_{r_0}^{a}, \qquad (54) \end{aligned}$$

For A = 1.23, χ = -2, ω = - 2, r = 1.94973e+13, c_3 = 7.74 or -10, B = -0.44, n = -0.4

Ω = -6.11150… Λ = -2.45285… τ = -2.45285

ζ = 1.141592653589.. p = 36.265482457.... q = 45.398223686… a = 2, b = 3,

b(a) = 5, ν(a) = 8 σ or Σ = -0.2518301318459

$$\left[a\left(1-\frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1-b/a}\right)\right]$$

((2(1-(5/2) ln((e^8)/(1-1.5))))

Input:

$$2\left(1-\frac{5}{2}\right)\log\left(\frac{e^8}{1-1.5}\right)$$

log(x) is the natural logarithm

Result:

$-26.0794\ldots -$
$9.42478\ldots\, i$

Polar coordinates:

$r = 27.7302$ (radius), $\theta = -160.131°$ (angle)

27.7302

$$\left[\left\{\frac{2(n-1)(\chi+4\pi)e^{4B\Omega}r^{\Sigma}}{(3n\chi+8\pi n+\chi)[(n+3)\chi+8\pi]^{-\Sigma}}\right.\right.$$
$$-2C_3^2 nr(\chi+2\pi)[(n+3)\chi+8\pi]+$$

2(-0.4-1)(-2+4Pi)*exp(4*-0.44*-6.11150)*(1.94973e+13)^(-0.25183)* 1/(((3(-0.4*-2)+8Pi*-0.4-2)))*1/((((-0.4+3)*(-2)+8Pi)))^-(-0.25183) – 2*7.74^2*(-0.4)*(1.94973e+13)*(-2+2Pi)*((-0.4+3)*(-2)+8Pi)

Input interpretation:

$$2(-0.4-1)\times\left((-2+4\pi)\exp(4\times(-0.44)\times(-6.11150))\times\frac{1}{3(-0.4\times(-2))+8\pi\times(-0.4)-2}\times\frac{1}{((-0.4+3)\times(-2)+8\pi)^{-(-0.25183)}}\right)/\left(1.94973\times10^{13}\right)^{0.25183}-2\times7.74^2\times(-0.4)\times1.94973\times10^{13}(-2+2\pi)((-0.4+3)\times(-2)+8\pi)$$

Result:

$7.97775\ldots\times10^{16}$

7.97775*10^16

$$\left(e^{4B\Omega}[(n+3)\chi+8\pi]^{\Lambda}r^{\tau}+C_3^2 n(\chi+2\pi)\right)$$

exp(((((4*-0.44*-6.11150)))))*((((((-0.4+3)*(-2)+8Pi))^(-2.45285)))) * (1.94973e+13)^(-2.45285)+7.74^2*(-0.4)*(-2+2Pi)

Input interpretation:

$$\frac{\exp(4\times(-0.44)\times(-6.11150))}{((-0.4+3)\times(-2)+8\pi)^{2.45285}\left(1.94973\times10^{13}\right)^{2.45285}}+7.74^2\times(-0.4)(-2+2\pi)$$

Result:

−102.638...

-102.638…

$$\log\left[\frac{2C_2^2C_3^2r^2\{n\chi+\pi(3n-1)\}}{e^{4B\Omega}r^{\Lambda}[(n+3)\chi+8\pi]^{\Lambda}+C_3^2n(\chi+2\pi)}\right]\Bigg\}$$

$$\left[\frac{2C_3^2\{n\chi+\pi(3n-1)\}}{\{(n+3)\chi+8\pi\}^{-1}}\right]^{-1}\Bigg]_{r_0}^{a}, \qquad (54)$$

ln(((((2*100*7.74^2*(1.94973e+13)^2((-0.4*-2+Pi(3*(-0.4)-1)))) / ((((((((exp(4*-0.44*-6.11150)*(1.94973e+13)^(-2.45285))))*(((((-0.4+3)*(-2)+8Pi)))))^(-2.45285)+7.74^2*(-0.4)*(-2+2Pi)))))))))

Input interpretation:

$$\log\left(\frac{2\times100\times7.74^2\,(1.94973\times10^{13})^2\,(-0.4\times(-2)+\pi\,(3\times(-0.4)-1))}{\frac{1}{\left(\frac{\exp(4\times(-0.44)\times(-6.11150))}{(1.94973\times10^{13})^{2.45285}}\,((-0.4+3)\times(-2)+8\,\pi)\right)^{2.45285}}+7.74^2\times(-0.4)\,(-2+2\,\pi)}\right)$$

log(*x*) is the natural logarithm

Result:

−77.9847... + 3.14159... *i*

Polar coordinates:

$r = 78.048$ (radius), $\theta = 177.693°$ (angle)

78.048

((((2*7.74^2(((-0.4*-2+Pi(3*(-0.4)-1)))/(((-0.4+3)*(-2)+8Pi)))^(-1)))))^-1

Input:

$$\frac{1}{\frac{2\times7.74^2}{\frac{-0.4\times(-2)+\pi\,(3\times(-0.4)-1)}{(-0.4+3)\times(-2)+8\,\pi}}}$$

Result:

−0.00255899...

-0.00255899…

$$I_V(WH2) = \left[a\left(1-\frac{b(a)}{a}\right)\ln\left(\frac{e^{\nu(a)}}{1-b/a}\right)\right] -$$
$$\left[\left\{\frac{2(n-1)(\chi+4\pi)e^{4B\Omega}r^{\Sigma}}{(3n\chi+8\pi n+\chi)[(n+3)\chi+8\pi]^{-\Sigma}}\right.\right.$$
$$-2C_3^2 nr(\chi+2\pi)[(n+3)\chi+8\pi]+$$
$$\left(e^{4B\Omega}[(n+3)\chi+8\pi]^{\Lambda}r^{\tau}+C_3^2 n(\chi+2\pi)\right)$$
$$\left.\log\left[\frac{2C_2^2C_3^2r^2\{n\chi+\pi(3n-1)\}}{e^{4B\Omega}r^{\Lambda}[(n+3)\chi+8\pi]^{\Lambda}+C_3^2n(\chi+2\pi)}\right]\right\}$$
$$\left.\left[\frac{2C_3^2\{n\chi+\pi(3n-1)\}}{\{(n+3)\chi+8\pi\}^{-1}}\right]^{-1}\right]_{r_0}^{a}, \qquad (54)$$

27.7302 – (((7.97775*10^16 + (-102.638) *78.048 * (-0.00255899))))

Input interpretation:

$27.7302 - (7.97775\times 10^{16} - 102.638\times 78.048\times(-0.00255899))$

Result:

$-7.97774999999999927690771999097 6\times 10^{16}$

Repeating decimal:

$-7.977749999999999276907719990976\times 10^{16}$

-7.97774999…*10^16

From which:

-(-((((27.7302 – (((7.97775*10^16 + (-102.638) *78.048 * (-0.00255899)))))))))^1/64

Input interpretation:

$-\sqrt[64]{-(27.7302 - (7.97775\times 10^{16} - 102.638\times 78.048\times(-0.00255899)))}$

Result:

-1.8369269…

-1.8369269…

From the previous Ramanujan expression

$$0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi))\left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)$$

we obtain:

-(([1-((((1/2*1/((((0.072815845483680 – (Pi^2)/24 + 1/2 (0.582879670292435+ ln(2Pi)) (0.582879670292435 – ln(Pi/(2sin(1/2*Pi)))) – (((ln(1)/1 cos(Pi) + ln(2)/2 cos(2Pi))))))))))] -(76+76/2)*1/10^3))

Input interpretation:

$$-\left(\left(1 - \frac{1}{2}\times 1 \Big/ \left(0.072815845483680 - \frac{\pi^2}{24} + \frac{1}{2}(0.582879670292435 + \log(2\pi)) \left(0.582879670292435 - \log\left(\frac{\pi}{2\sin\left(\frac{1}{2}\pi\right)}\right)\right) - \left(\frac{\log(1)}{1}\cos(\pi) + \frac{\log(2)}{2}\cos(2\pi)\right)\right)\right) - \left(76 + \frac{76}{2}\right)\times\frac{1}{10^3}\right)$$

log(x) is the natural logarithm

Result:

−1.83643978278841...

-1.83643978278841…

Alternative representations:

$$-\left(\left(1-1\Big/\left(2\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=-1+\frac{114}{10^3}+1\Big/\left(2\left(0.07281584548368000000+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\cos(0)}\right)\right)-\frac{1}{2}\log(1)\left(e^{-i\pi}+e^{i\pi}\right)-\frac{1}{4}\log(2)\left(e^{-2i\pi}+e^{2i\pi}\right)-\frac{\pi^2}{24}\right)\right)$$

$$-\left(\left(1-1\Big/\left(2\left(0.07281584548368000000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=-1+\frac{114}{10^3}+1\Big/\left(2\left(0.07281584548368000000-\cosh(-i\pi)\log_e(1)-\frac{1}{2}\cosh(-2i\pi)\log_e(2)+\frac{1}{2}(0.5828796702924350000+\log_e(2\pi))\left(0.5828796702924350000-\log_e\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

$$-\left(\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-1+\frac{114}{10^3}+1\Big/\left(2\left(0.0728158454836800000-\cosh(i\pi)\log(a)\log_a(1)-\frac{1}{2}\cosh(2i\pi)\log(a)\log_a(2)+\frac{1}{2}(0.5828796702924350000+\log(a)\log_a(2\pi))\left(0.5828796702924350000-\log(a)\log_a\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\frac{\pi^2}{24}\right)\right)$$

Integral representations:

$$-\left(\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}\,(0.5828796702924350000+\log(2\,\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\,\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\left(\left(\left(0.88600000000000000\left(7.7194532465998121+1.00000000000000000\,\pi^2-24.0000000000000000\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2\,e^{(3\,\pi^2)/(4\,s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4\,i\,\pi\sqrt{s}}\,ds-6.9945560435092200\log(2\,\pi)+6.9945560435092200\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\,\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\right)\Big/\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}-\frac{e^{-\pi^2/s+s}\left(2\,e^{(3\,\pi^2)/(4\,s)}\log(1)+\log(2)\right)\sqrt{\pi}}{4\,i\,\pi\sqrt{s}}\,ds-6.9945560435092200\log(2\,\pi)+6.9945560435092200\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)+12.0000000000000000\log(2\,\pi)\log\left(\frac{1}{\int_0^1\cos\left(\frac{\pi t}{2}\right)dt}\right)\right)\right)\right)\quad \text{for } \gamma>0$$

$$-\left(\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\left(\left(0.88600000000000000\left(7.7194532465998121+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\Big/$$

$$\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\quad \text{for } \gamma>0$$

$$-\left(\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\left(\left(0.886000000000000000\left(7.7194532465998121+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\right)\Big/\left(-5.8245648120909328+1.00000000000000000\,\pi^2-24.0000000000000000\int_{\frac{\pi}{2}}^{\pi}\left(\log(1)\sin(t)+\frac{3}{2}\log(2)\sin(-\pi+3t)\right)dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{i\pi^2}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{4^{-1+2s}\pi^{1-2s}\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}ds}\right)\right)\right) \quad \text{for } 0<\gamma<1$$

$$-\left(\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\left(\left(0.886000000000000000\left(7.7194532465998121+1.000000000000000000\pi^2+24.0000000000000000\log(1)-24.0000000000000000\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\Big/\left(-5.8245648120909328+1.000000000000000000\pi^2+24.0000000000000000\log(1)-24.0000000000000000\pi\log(1)\int_0^1\sin(\pi t)\,dt+12.0000000000000000\log(2)-24.0000000000000000\pi\log(2)\int_0^1\sin(2\pi t)\,dt-6.9945560435092200\log(2\pi)+6.9945560435092200\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)+12.0000000000000000\log(2\pi)\log\left(\frac{4i\pi}{\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(16s)+s}}{s^{3/2}}\,ds}\right)\right)\right)\quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$-\left(\left(1-1\middle/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\frac{443}{500}+1\middle/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}-0.5000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)+\log(1)\left(-1+2\sin^2\left(\frac{\pi}{2}\right)\right)+\frac{1}{2}\log(2)\left(-1+2\sin^2(\pi)\right)\right)\right)$$

$$-\left(\left(1-1\middle/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\frac{443}{500}+1\middle/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\log(1)-2\cos^2\left(\frac{\pi}{2}\right)\log(1)-\frac{1}{2}\left(-1+2\cos^2(\pi)\right)\log(2)-0.5000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)$$

$$-\left(\left(1-1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\frac{1}{2}(0.5828796702924350000+\log(2\pi))\left(0.5828796702924350000-\log\left(\frac{\pi}{2\sin\left(\frac{\pi}{2}\right)}\right)\right)-\left(\log(1)\cos(\pi)+\frac{1}{2}\log(2)\cos(2\pi)\right)\right)\right)\right)-\frac{76+\frac{76}{2}}{10^3}\right)=$$

$$-\frac{443}{500}+1\Big/\left(2\left(0.0728158454836800000-\frac{\pi^2}{24}+\cos\left(\frac{\pi}{3}\right)\left(3-4\cos^2\left(\frac{\pi}{3}\right)\right)\log(1)+\frac{1}{2}\cos\left(\frac{2\pi}{3}\right)\left(3-4\cos^2\left(\frac{2\pi}{3}\right)\right)\log(2)-0.5000000000000000000\,(0.5828796702924350000+\log(2)+\log(\pi))\left(-0.5828796702924350000+\log\left(\frac{1}{2}\right)+\log\left(\frac{\pi}{\sin\left(\frac{\pi}{2}\right)}\right)\right)\right)\right)$$

Appendix

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

Spyros D. Avramis, Alex Kehagiasb and Constantina Mattheopoulou

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m	L_0	d	S	S_{BH}	m	L_0	d	S	S_{BH}
3	1	196883	12.1904	12.5664	6	1	42987519	17.5764	17.7715
	2	21296876	16.8741	17.7715		2	40448921875	24.4233	25.1327
	3	842609326	20.5520	21.7656		3	8463511703277	29.7668	30.7812
4	2/3	139503	11.8458	11.8477	7	2/3	7402775	15.8174	15.6730
	5/3	69193488	18.0524	18.7328		5/3	33934039437	24.2477	24.7812
	8/3	6928824200	22.6589	23.6954		8/3	16953652012291	30.4615	31.3460
5	1/3	20619	9.9340	9.3664	8	1/3	278511	12.5372	11.8477
	4/3	86645620	18.2773	18.7328		4/3	13996384631	23.3621	23.6954
	7/3	24157197490	23.9078	24.7812		7/3	19400406113385	30.5963	31.3460

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

Observations

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 *n*th 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

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Manuscript Book 2 of Srinivasa Ramanujan

Traversable wormholes in *f*(R, T) gravity with conformal motions
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