On some Ramanujan integrals concerning Riemann's functions ξ(s) and Ξ(t): mathematical connections with ϕ, $\zeta(2)$ and various parameters of Particle Physics. II

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Abstract

In this paper we have described and analyzed some Ramanujan integrals concerning Riemann's functions ξ(s) *and* Ξ(t). *Furthermore, we have obtained several mathematical connections between* ϕ, $\zeta(2)$ *and various parameters of Particle Physics.*

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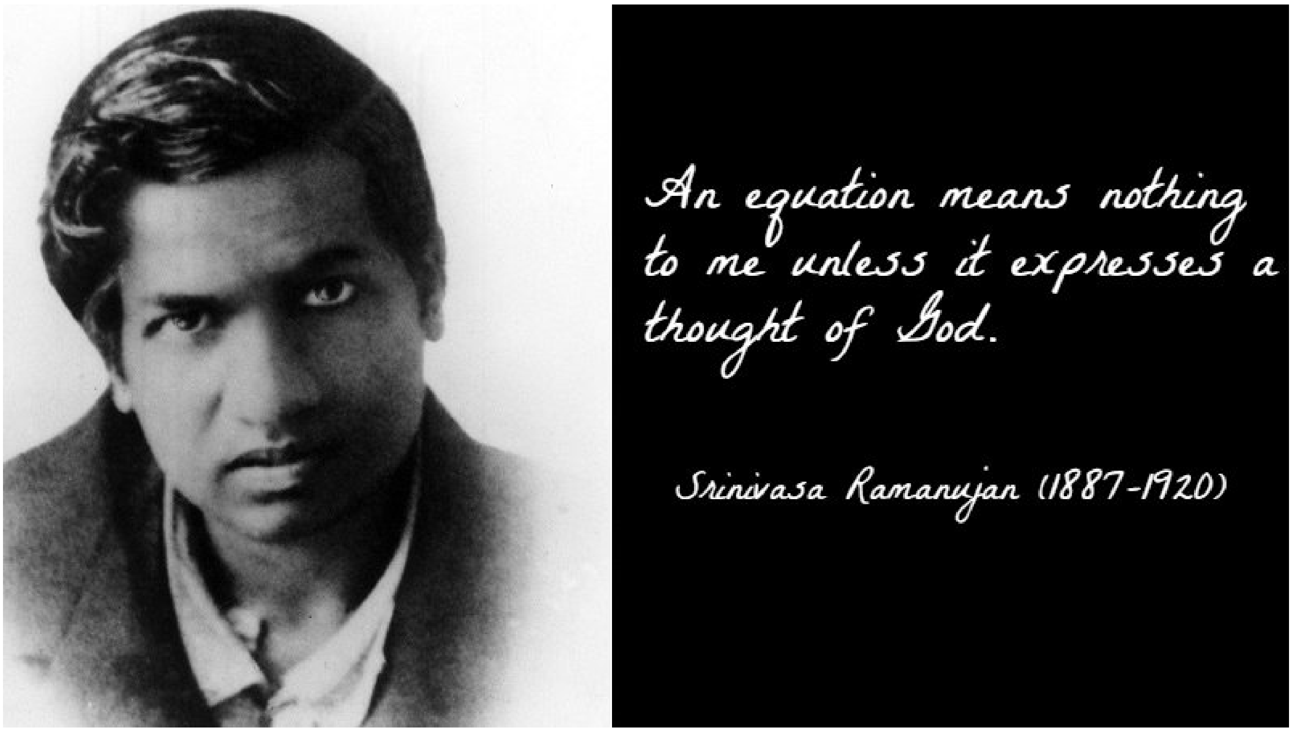

https://mobygeek.com/features/indian-mathematician-srinivasa-ramanujan-quotes-11012

We want to highlight that the development of the various equations was carried out according an our possible logical and original interpretation

From:

New expressions for Riemann's functions ξ(s) and Ξ(t) – *Srinivasa Ramanujan*
Quarterly Journal of Mathematics, XLVI, 1915, 253 – 260

We have that:

For:

$$\xi(s) = (s-1)\Gamma(1+\frac{1}{2}s)\pi^{-\frac{1}{2}s}\zeta(s).$$

$$\xi(\frac{1}{2}+\frac{1}{2}it) = \Xi(\frac{1}{2}t)$$

Thence, for t = 1:

(1/2+1/2i-1) gamma (1+1/2*(1/2+1/2i))*Pi^(-1/2*(1/2+1/2i))* zeta(1/2+1/2i)

Input:

$$\left(\frac{1}{2}+\frac{1}{2}i-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2}i\right)\right)\pi^{-1/2(1/2+1/2i)}\zeta\left(\frac{1}{2}+\frac{1}{2}i\right)$$

$\Gamma(x)$ is the gamma function

$\zeta(s)$ is the Riemann zeta function

i is the imaginary unit

Exact result:

$$\left(-\frac{1}{2}+\frac{i}{2}\right)\pi^{-1/4-i/4}\zeta\left(\frac{1}{2}+\frac{i}{2}\right)\Gamma\left(\frac{5}{4}+\frac{i}{4}\right)$$

Decimal approximation:

0.494256987910076300380568818360138186867976223134574011846...

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

0.49425698791……

Alternate forms:

$$-\frac{1}{4}\pi^{-1/4-i/4}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)\Gamma\left(\frac{1}{4}+\frac{i}{4}\right)$$

$$\left(-\frac{4}{13}+\frac{6\,i}{13}\right)\pi^{-1/4-i/4}\left(\frac{5}{4}+\frac{i}{4}\right)!\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)$$

$n!$ is the factorial function

Alternative representations:

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)=\left(-\frac{1}{2}+\frac{i}{2}\right)\exp\left(-\log G\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)+\log G\left(2+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\right)\pi^{1/2\,(-1/2-i/2)}\,\zeta\left(\frac{1}{2}+\frac{i}{2},1\right)$$

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)=\left(-\frac{1}{2}+\frac{i}{2}\right)(1)_{\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{1/2\,(-1/2-i/2)}\,\zeta\left(\frac{1}{2}+\frac{i}{2},1\right)$$

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)=\frac{\left(-\frac{1}{2}+\frac{i}{2}\right)G\left(2+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(-1/2-i/2)}\,\zeta\left(\frac{1}{2}+\frac{i}{2},1\right)}{G\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)}$$

Series representations:

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)=\pi^{-1/4-i/4}\,\Gamma\left(\frac{5}{4}+\frac{i}{4}\right)\sum_{n=0}^{\infty}\frac{\sum_{k=0}^{n}(-1)^k\,(1+k)^{1/2-i/2}\binom{n}{k}}{1+n}$$

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)=\frac{(1-i)\,2^{-1+i/2}\,\pi^{-1/4-i/4}\,\Gamma\left(\frac{5}{4}+\frac{i}{4}\right)\sum_{n=0}^{\infty}2^{-1-n}\sum_{k=0}^{n}(-1)^k\,(1+k)^{-1/2-i/2}\binom{n}{k}}{-2^{i/2}+\sqrt{2}}$$

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)=\left(-\frac{1}{2}+\frac{i}{2}\right)\pi^{-1/4-i/4}\,\Gamma\left(\frac{5}{4}+\frac{i}{4}\right)\sum_{k=0}^{\infty}\frac{\left(\left(\frac{1}{2}+\frac{i}{2}\right)-s_0\right)^k\zeta^{(k)}(s_0)}{k!}\quad\text{for } s_0\neq 1$$

Integral representations:

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

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)= \frac{(1-i)\,2^{-1+i/2}\,\pi^{-1/4-i/4}\left(\int_0^\infty \frac{t^{-1/2+i/2}}{1+e^t}\,dt\right)\int_0^1 \log^{1/4+i/4}\left(\frac{1}{t}\right)dt}{\left(-2^{i/2}+\sqrt{2}\right)\Gamma\left(\frac{1}{2}+\frac{i}{2}\right)}$$

$$\left(\frac{1}{2}+\frac{i}{2}-1\right)\Gamma\left(1+\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\pi^{1/2\,(1/2+i/2)(-1)}\,\zeta\left(\frac{1}{2}+\frac{i}{2}\right)= \frac{(1-i)\,2^{-3/2+i}\,\pi^{-1/4-i/4}\left(\int_0^1 \log^{1/4+i/4}\left(\frac{1}{t}\right)dt\right)\int_0^\infty t^{1/2+i/2}\,\mathrm{sech}^2(t)\,dt}{\left(-2^{i/2}+\sqrt{2}\right)\Gamma\left(\frac{3}{2}+\frac{i}{2}\right)}$$

From

$$\alpha^{-\frac{1}{4}}\left\{\frac{1}{1+t^2}-4\alpha\int_0^\infty\left(\frac{3}{3^2+t^2}-\frac{\alpha}{1!}\frac{7x^2}{7^2+t^2}+\frac{\alpha^2}{2!}\frac{11x^4}{11^2+t^2}-\cdots\right)\frac{x\,dx}{e^{2\pi x}-1}\right\}$$
$$+\beta^{-\frac{1}{4}}\left\{\frac{1}{1+t^2}-4\beta\int_0^\infty\left(\frac{3}{3^2+t^2}-\frac{\beta}{1!}\frac{7x^2}{7^2+t^2}+\frac{\beta^2}{2!}\frac{11x^4}{11^2+t^2}-\cdots\right)\frac{x\,dx}{e^{2\pi x}-1}\right\}$$
$$=\frac{1}{4}\pi^{-\frac{3}{4}}\Gamma\left(\frac{-1+it}{4}\right)\Gamma\left(\frac{-1-it}{4}\right)\Xi\left(\frac{1}{2}t\right)\cos\left(\frac{t}{8}\log\frac{\alpha}{\beta}\right). \quad (9)$$

For $t = 1$, $\alpha = 2$, $\beta = \pi^2/2$, and $\Xi(1/2\ t) = 0.49425698791$, we obtain:

1/4*Pi^(-3/4) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791 * cos(1/8*ln(Pi^2))

Input interpretation:

$$\frac{1}{4}\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\cos\left(\frac{1}{8}\log(\pi^2)\right)$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

0.51792798277...

0.51792798277…

Alternative representations:

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$\frac{1}{4}\times 0.494256987910000\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\exp\left(-\log G\left(\frac{1}{4}(-1-i)\right)+\log G\left(1+\frac{1}{4}(-1-i)\right)\right)\exp\left(-\log G\left(\frac{1}{4}(-1+i)\right)+\log G\left(1+\frac{1}{4}(-1+i)\right)\right)\pi^{-3/4}$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$\frac{0.494256987910000\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$\frac{0.494256987910000\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(-\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}$$

Series representations:

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$-\left(\left(1.9770279516400\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}\,4^{-3k_1-k_2-k_3}\,(-1-i)^{k_2}\,(-1+i)^{k_3}\,\log^{2k_1}(\pi^2)\,\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{(2k_1)!\,k_2!\,k_3!}\right)\Big/\right.$$
$$\left.\left((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i)\,\pi^{3/4}\right)\right)$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$\frac{1}{\pi^{3/4}}0.123564246977500\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{\left(-\frac{1}{64}\right)^{k_1}\log^{2k_1}(\pi^2)\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)}{(2k_1)!\,k_2!\,k_3!}\quad\text{for }(z_0\notin\mathbb{Z}\text{ or }z_0>0)$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$-\left(\left(1.9770279516400\left(1.00000000000000\,J_0\left(\frac{\log(\pi^2)}{8}\right)\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}\,(-1-i)^{k_1}\,(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}+\right.\right.\right.$$
$$2.0000000000000\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{k_2!\,k_3!}(-1)^{k_1}\,4^{-k_2-k_3}$$
$$\left.\left.(-1-i)^{k_2}\,(-1+i)^{k_3}\,J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right)\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)\right)\right)\Big/$$
$$\left.\left((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i)\,\pi^{3/4}\right)\right)$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$\frac{1}{\pi^{3/4}}\,0.123564246977500\left(1.00000000000000\,J_0\left(\frac{\log(\pi^2)}{8}\right)\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}+\right.$$
$$2.00000000000000\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{k_2!\,k_3!}(-1)^{k_1}\,J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right)\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}$$
$$\left.\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\right)\text{ for }(z_0\notin\mathbb{Z}\text{ or }z_0>0)$$

Integral representations:

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$-\frac{0.494256987910000\,\pi^{5/4}\,\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{\frac{\pi}{2}}^{\frac{\log(\pi^2)}{8}}\sin(t)\,dt$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$-\left(\left(0.0617821234887500\,\pi^{5/4}\,\mathcal{A}^2\left(-8.00000000000000+\log(\pi^2)\int_0^1\sin\left(\frac{1}{8}\,t\log(\pi^2)\right)dt\right)\right)\Big/\left(\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt\right)\right)$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)=$$
$$\frac{0.247128493955000\,\sqrt[4]{\pi}\,\mathcal{A}\sqrt{\pi}}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{s-\log^2(\pi^2)/(256s)}}{\sqrt{s}}\,ds\quad\text{for }\gamma>0$$

Multiple-argument formulas:

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right) = \frac{1}{\pi^{3/4}\sqrt{\pi}^2}\,0.0436865584749998 \left(-0.500000000000000+1.00000000000000\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right) \Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right) = -\frac{1}{\pi^{3/4}\sqrt{\pi}^2}\,0.0436865584749998\,\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right) \Gamma\left(\frac{3+i}{8}\right)\left(-0.500000000000000+1.00000000000000\sin^2\left(\frac{\log(\pi^2)}{16}\right)\right)$$

$$\frac{1}{4}\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\left(0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right) = \frac{1}{\pi^{3/4}\sqrt{\pi}^2}\,0.0873731169499996 \left(-0.750000000000000\cos\left(\frac{\log(\pi^2)}{24}\right)+1.00000000000000\cos^3\left(\frac{\log(\pi^2)}{24}\right)\right) \Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

We note that, multiplying by π the above expression and subtracting $(7+2)/10^3$ (where 7 and 2 are primes and Lucas numbers), we obtain:

Pi*(((1/4*Pi^(-3/4) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791 * cos(1/8*ln(Pi^2))))))-(7+2)1/10^3

Input interpretation:

$$\pi\left(\frac{1}{4}\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\cos\left(\frac{1}{8}\log(\pi^2)\right)\right)-(7+2)\times\frac{1}{10^3}$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

1.6181187458...

1.6181187458…

Alternative representations:

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$\frac{1}{4}\times 0.494256987910000\,\pi\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\exp\left(-\log G\left(\frac{1}{4}(-1-i)\right)+\log G\left(1+\frac{1}{4}(-1-i)\right)\right)\exp\left(-\log G\left(\frac{1}{4}(-1+i)\right)+\log G\left(1+\frac{1}{4}(-1+i)\right)\right)\pi^{-3/4}-\frac{9}{10^3}$$

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$\frac{0.494256987910000\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}-\frac{9}{10^3}$$

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$\frac{0.494256987910000\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(-\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}-\frac{9}{10^3}$$

Series representations:

$$\frac{1}{4}\pi\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$

$$-\left(\left(0.009000000000000\left(-1.00000000000000+1.00000000000000\,i^2+219.66977240444\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{(2k_1)!\,k_2!\,k_3!}(-1)^{k_1}\,4^{-3k_1-k_2-k_3}(-1-i)^{k_2}(-1+i)^{k_3}\log^{2k_1}(\pi^2)\,\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)\right)\right)\Big/\left((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i)\right)\right)$$

$$\frac{1}{4}\pi\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$

$$0.123564246977500\left(-0.072836602983052+1.00000000000000\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{(2k_1)!\,k_2!\,k_3!}\left(-\frac{1}{64}\right)^{k_1}\log^{2k_1}(\pi^2)\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\right)\quad\text{for }(z_0\notin\mathbb{Z}\text{ or }z_0>0)$$

$$\frac{1}{4}\pi\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$

$$-\left(\left(0.009000000000000\left(-1.00000000000000+1.00000000000000\,i^2+219.66977240444\sqrt[4]{\pi}\,J_0\left(\frac{\log(\pi^2)}{8}\right)\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}+439.33954480889\sqrt[4]{\pi}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{k_2!\,k_3!}(-1)^{k_1}\,4^{-k_2-k_3}(-1-i)^{k_2}(-1+i)^{k_3}J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right)\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)\right)\right)\Big/\left((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i)\right)\right)$$

Integral representations:

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$-\frac{9}{1000}-\frac{0.494256987910000\,\pi^{9/4}\,\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{\frac{\pi}{2}}^{\frac{\log(\pi^2)}{8}}\sin(t)\,dt$$

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$-\frac{9}{1000}+\frac{\pi^{9/4}\,\mathcal{A}^2\left(0.49425698791000-0.061782123488750\log(\pi^2)\int_0^1\sin\left(\frac{1}{8}\,t\log(\pi^2)\right)dt\right)}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$-\frac{9}{1000}+\frac{0.247128493955000\,\pi^{5/4}\,\mathcal{A}\sqrt{\pi}}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{s-\log^2(\pi^2)/(256s)}}{\sqrt{s}}\,ds\quad\text{for }\gamma>0$$

Multiple-argument formulas:

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$-0.0090000000000000+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\left(-0.0218432792374999+0.0436865584749998\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$-0.0090000000000000+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\,\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)\left(0.0218432792374999-0.0436865584749998\sin^2\left(\frac{\log(\pi^2)}{16}\right)\right)$$

$$\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)-\frac{7+2}{10^3}=$$
$$-\frac{9}{1000}+\frac{1}{\sqrt{\pi}^2}\,0.0873731169499996\sqrt[4]{\pi}\left(-0.750000000000000\cos\left(\frac{\log(\pi^2)}{24}\right)+1.00000000000000\cos^3\left(\frac{\log(\pi^2)}{24}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

From the same expression, we obtain also:

10^3(((Pi*(((1/4*Pi^(-3/4) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791 * cos(1/8*ln(Pi^2))))))+(47-2)/10^3)))

Input interpretation:

$$10^3\left(\pi\left(\frac{1}{4}\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\cos\left(\frac{1}{8}\log(\pi^2)\right)\right)+\frac{47-2}{10^3}\right)$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

1672.1187458...

1672.1187458… result practically equal to the rest mass of Omega baryon 1672.45

Alternative representations:

$$10^3\left(\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+\frac{47-2}{10^3}\right)=10^3\left(\frac{1}{4}\times 0.494256987910000\,\pi\cosh\left(\frac{1}{8}i\log(\pi^2)\right)\exp\left(-\log G\left(\frac{1}{4}(-1-i)\right)+\log G\left(1+\frac{1}{4}(-1-i)\right)\right)\exp\left(-\log G\left(\frac{1}{4}(-1+i)\right)+\log G\left(1+\frac{1}{4}(-1+i)\right)\right)\pi^{-3/4}+\frac{45}{10^3}\right)$$

$$10^3 \left(\frac{1}{4} \pi \pi^{-3/4} \left(\Gamma\left(\frac{1}{4} (-1+i)\right)\left(\Gamma\left(\frac{1}{4} (-1-i)\right) 0.494256987910000 \cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right) + \frac{47-2}{10^3}\right) = 10^3 \left(\frac{0.494256987910000\, \pi\, G\left(1+\frac{1}{4}(-1-i)\right) G\left(1+\frac{1}{4}(-1+i)\right) \cosh\left(\frac{1}{8}\, i \log(\pi^2)\right) \pi^{-3/4}}{4\, G\left(\frac{1}{4}(-1-i)\right) G\left(\frac{1}{4}(-1+i)\right)} + \frac{45}{10^3}\right)$$

$$10^3 \left(\frac{1}{4} \pi \pi^{-3/4} \left(\Gamma\left(\frac{1}{4} (-1+i)\right)\left(\Gamma\left(\frac{1}{4} (-1-i)\right) 0.494256987910000 \cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right) + \frac{47-2}{10^3}\right) = 10^3 \left(\frac{0.494256987910000\, \pi\, G\left(1+\frac{1}{4}(-1-i)\right) G\left(1+\frac{1}{4}(-1+i)\right) \cosh\left(-\frac{1}{8}\, i \log(\pi^2)\right) \pi^{-3/4}}{4\, G\left(\frac{1}{4}(-1-i)\right) G\left(\frac{1}{4}(-1+i)\right)} + \frac{45}{10^3}\right)$$

Series representations:

$$10^3 \left(\frac{1}{4} \pi \pi^{-3/4} \left(\Gamma\left(\frac{1}{4} (-1+i)\right)\left(\Gamma\left(\frac{1}{4} (-1-i)\right) 0.494256987910000 \cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right) + \frac{47-2}{10^3}\right) = \left(45.00000000000 \left(-1.00000000000000 + 1.00000000000000\, i^2 - 43.933954480889 \sqrt[4]{\pi} \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{(-1)^{k_1}\, 4^{-3k_1-k_2-k_3}\, (-1-i)^{k_2}\, (-1+i)^{k_3}\, \log^{2k_1}(\pi^2)\, \Gamma^{(k_2)}(1)\, \Gamma^{(k_3)}(1)}{(2k_1)!\, k_2!\, k_3!}\right)\right) \Big/ ((-1.00000000000000 + 1.00000000000000\, i)(1.00000000000000 + 1.00000000000000\, i))$$

$$10^3 \left(\frac{1}{4} \pi \pi^{-3/4} \left(\Gamma\left(\frac{1}{4} (-1+i)\right)\left(\Gamma\left(\frac{1}{4} (-1-i)\right) 0.494256987910000 \cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right) + \frac{47-2}{10^3}\right) =$$

$$123.564246977500 \left(0.36418301491526 + 1.00000000000000 \sqrt[4]{\pi} \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{1}{(2k_1)!\, k_2!\, k_3!} \left(-\frac{1}{64}\right)^{k_1} \log^{2k_1}(\pi^2) \left(\frac{1}{4} (-1+i) - z_0\right)^{k_2} \left(-\frac{1}{4} - \frac{i}{4} - z_0\right)^{k_3} \Gamma^{(k_2)}(z_0)\, \Gamma^{(k_3)}(z_0)\right) \text{ for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$10^3 \left(\frac{1}{4} \pi \pi^{-3/4} \left(\Gamma\left(\frac{1}{4} (-1+i)\right)\left(\Gamma\left(\frac{1}{4} (-1-i)\right) 0.494256987910000 \cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right) + \frac{47-2}{10^3}\right) = \left(45.000000000000 \left(-1.00000000000000 + 1.00000000000000\, i^2 - 43.933954480889 \sqrt[4]{\pi}\, J_0\left(\frac{\log(\pi^2)}{8}\right) \sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{4^{-k_1-k_2} (-1-i)^{k_1} (-1+i)^{k_2} \Gamma^{(k_1)}(1)\, \Gamma^{(k_2)}(1)}{k_1!\, k_2!} - 87.867908961778 \sqrt[4]{\pi} \sum_{k_1=1}^{\infty} \sum_{k_2=0}^{\infty} \sum_{k_3=0}^{\infty} \frac{(-1)^{k_1}\, 4^{-k_2-k_3} (-1-i)^{k_2} (-1+i)^{k_3} J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right) \Gamma^{(k_2)}(1)\, \Gamma^{(k_3)}(1)}{k_2!\, k_3!}\right)\right) \Big/ ((-1.00000000000000 + 1.00000000000000\, i)(1.00000000000000 + 1.00000000000000\, i))$$

Integral representations:

$$10^3 \left(\frac{1}{4} \pi \pi^{-3/4} \left(\Gamma\left(\frac{1}{4} (-1+i)\right)\left(\Gamma\left(\frac{1}{4} (-1-i)\right) 0.494256987910000 \cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right) + \frac{47-2}{10^3}\right) = 45 - \frac{494.256987910000\, \pi^{9/4} \mathcal{A}^2}{\oint_L e^t\, t^{1/4+i/4}\, dt \oint_L e^t\, t^{1/4-i/4}\, dt} \int_{\frac{\pi}{2}}^{\frac{\log(\pi^2)}{8}} \sin(t)\, dt$$

$$10^3\left(\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+\frac{47-2}{10^3}\right)=$$
$$45+\frac{\pi^{9/4}\,\mathcal{A}^2\left(494.25698791000-61.782123488750\log(\pi^2)\int_0^1\sin\left(\frac{1}{8}t\log(\pi^2)\right)dt\right)}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

$$10^3\left(\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+\frac{47-2}{10^3}\right)=$$
$$45+\frac{247.128493955000\,\pi^{5/4}\,\mathcal{A}\sqrt{\pi}}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{s-\log^2(\pi^2)/(256s)}}{\sqrt{s}}\,ds\quad\text{for }\gamma>0$$

Multiple-argument formulas:

$$10^3\left(\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+\frac{47-2}{10^3}\right)=45.0000000000000+$$
$$\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\left(-21.8432792374999+43.6865584749998\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

$$10^3\left(\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+\frac{47-2}{10^3}\right)=45.0000000000000+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\,\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)$$
$$\Gamma\left(\frac{3+i}{8}\right)\left(21.8432792374999-43.6865584749998\sin^2\left(\frac{\log(\pi^2)}{16}\right)\right)$$

$$10^3\left(\frac{1}{4}\pi\,\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+\frac{47-2}{10^3}\right)=45+\frac{1}{\sqrt{\pi}^2}87.3731169499996\sqrt[4]{\pi}$$
$$\left(-0.750000000000000\cos\left(\frac{\log(\pi^2)}{24}\right)+1.00000000000000\cos^3\left(\frac{\log(\pi^2)}{24}\right)\right)$$
$$\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

And again, we obtain:

76Pi*(((1/4*Pi^(-3/4) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791 * cos(1/8*ln(Pi^2)))))+2

Input interpretation:

$$76\pi\left(\frac{1}{4}\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\cos\left(\frac{1}{8}\log(\pi^2)\right)\right)+2$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

125.66102468...

125.66102468…

Alternative representations:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2+\frac{1}{4}\times 37.5635310811600\,\pi\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\exp\left(-\log G\left(\frac{1}{4}(-1-i)\right)+\log G\left(1+\frac{1}{4}(-1-i)\right)\right)\exp\left(-\log G\left(\frac{1}{4}(-1+i)\right)+\log G\left(1+\frac{1}{4}(-1+i)\right)\right)\pi^{-3/4}$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2+\frac{37.5635310811600\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2+\frac{37.5635310811600\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(-\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}$$

Series representations:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = \left(2.0000000000000\left(-1.00000000000000+1.00000000000000\,i^2 - 75.127062162320\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}\,4^{-3k_1-k_2-k_3}\,(-1-i)^{k_2}\,(-1+i)^{k_3}\,\log^{2k_1}(\pi^2)\,\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{(2k_1)!\,k_2!\,k_3!}\right)\right)\Big/((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i))$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 9.39088277029000\left(0.212972523342258+1.00000000000000\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{(2k_1)!\,k_2!\,k_3!}\left(-\frac{1}{64}\right)^{k_1}\log^{2k_1}(\pi^2)\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\right) \text{ for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 =$$

$$\Bigg(2.0000000000000\Bigg(-1.00000000000000+1.00000000000000\,i^2-75.127062162320\sqrt[4]{\pi}\,J_0\left(\frac{\log(\pi^2)}{8}\right)\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\Gamma^{(k_1)}(1)\Gamma^{(k_2)}(1)}{k_1!k_2!}-150.25412432464\sqrt[4]{\pi}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}4^{-k_2-k_3}(-1-i)^{k_2}(-1+i)^{k_3}J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right)\Gamma^{(k_2)}(1)\Gamma^{(k_3)}(1)}{k_2!k_3!}\Bigg)\Bigg)\Big/((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i))$$

Integral representations:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2-\frac{37.5635310811600\,\pi^{9/4}\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{\frac{\pi}{2}}^{\frac{\log(\pi^2)}{8}}\sin(t)\,dt$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2+\frac{\pi^{9/4}\mathcal{A}^2\left(37.563531081160-4.6954413851450\log(\pi^2)\int_0^1\sin\left(\frac{1}{8}t\log(\pi^2)\right)dt\right)}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2+\frac{18.7817655405800\,\pi^{5/4}\mathcal{A}\sqrt{\pi}}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{s-\log^2(\pi^2)/(256s)}}{\sqrt{s}}\,ds \quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2.00000000000000 + \frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\left(-1.66008922204999+3.32017844409999\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2.00000000000000 + \frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\,\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)\left(1.66008922204999-3.32017844409999\sin^2\left(\frac{\log(\pi^2)}{16}\right)\right)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+2 = 2 + \frac{1}{\sqrt{\pi}^2}6.64035688819997\sqrt[4]{\pi}\left(-0.750000000000000\cos\left(\frac{\log(\pi^2)}{24}\right)+1.00000000000000\cos^3\left(\frac{\log(\pi^2)}{24}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

76Pi*(((1/4*Pi^(-3/4) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791 * cos(1/8*ln(Pi^2)))))+18-2

Input interpretation:

$$76\pi\left(\frac{1}{4}\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\cos\left(\frac{1}{8}\log(\pi^2)\right)\right)+18-2$$

$\Gamma(x)$ is the gamma function

$\log(x)$ is the natural logarithm

i is the imaginary unit

Result:

139.66102468...

139.66102468...

Alternative representations:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$16+\frac{1}{4}\times 37.5635310811600\,\pi\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\exp\left(-\log G\left(\frac{1}{4}(-1-i)\right)+\log G\left(1+\frac{1}{4}(-1-i)\right)\right)\exp\left(-\log G\left(\frac{1}{4}(-1+i)\right)+\log G\left(1+\frac{1}{4}(-1+i)\right)\right)\pi^{-3/4}$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$16+\frac{37.5635310811600\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$16+\frac{37.5635310811600\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(-\frac{1}{8}\,i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}$$

Series representations:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$\left(16.000000000000\left(-1.00000000000000+1.00000000000000\,i^2-9.3908827702900\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}\,4^{-3k_1-k_2-k_3}\,(-1-i)^{k_2}\,(-1+i)^{k_3}\,\log^{2k_1}(\pi^2)\,\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{(2k_1)!\,k_2!\,k_3!}\right)\right)\Big/\left((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i)\right)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$9.39088277029000\left(1.70378018673807+1.00000000000000\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{(2k_1)!\,k_2!\,k_3!}\left(-\frac{1}{64}\right)^{k_1}\log^{2k_1}(\pi^2)\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\right)\quad\text{for } (z_0\notin\mathbb{Z}\text{ or } z_0>0)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$\left(16.000000000000\left(-1.00000000000000+1.00000000000000\,i^2-9.3908827702900\sqrt[4]{\pi}\,J_0\left(\frac{\log(\pi^2)}{8}\right)\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}-18.781765540580\sqrt[4]{\pi}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}4^{-k_2-k_3}(-1-i)^{k_2}(-1+i)^{k_3}J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right)\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{k_2!\,k_3!}\right)\right)\Big/((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i))$$

Integral representations:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$16-\frac{37.5635310811600\,\pi^{9/4}\,\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\,\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{\frac{\pi}{2}}^{\frac{\log(\pi^2)}{8}}\sin(t)\,dt$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2=$$
$$16+\frac{\pi^{9/4}\,\mathcal{A}^2\left(37.563531081160-4.6954413851450\log(\pi^2)\int_0^1\sin\left(\frac{1}{8}\,t\log(\pi^2)\right)dt\right)}{\oint_L e^t\,t^{1/4+i/4}\,dt\,\oint_L e^t\,t^{1/4-i/4}\,dt}$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2 = 16+\frac{18.7817655405800\,\pi^{5/4}\,\mathcal{A}\sqrt{\pi}}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{s-\log^2(\pi^2)/(256s)}}{\sqrt{s}}\,ds \quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2 = 16.0000000000000+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\left(-1.66008922204999+3.32017844409999\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2 = 16.0000000000000+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\,\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)\left(1.66008922204999-3.32017844409999\sin^2\left(\frac{\log(\pi^2)}{16}\right)\right)$$

$$\frac{1}{4}(76\pi)\pi^{-3/4}\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+18-2 = 16+\frac{1}{\sqrt{\pi}^2}6.64035688819997\sqrt[4]{\pi}\left(-0.750000000000000\cos\left(\frac{\log(\pi^2)}{24}\right)+1.00000000000000\cos^3\left(\frac{\log(\pi^2)}{24}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

27*1/2(((76Pi*(((1/4*Pi^(-3/4) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791 * cos(1/8*ln(Pi^2))))))+5-1/golden ratio)))+1/2

Input interpretation:

$$27\times\frac{1}{2}\left(76\pi\left(\frac{1}{4}\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\cos\left(\frac{1}{8}\log(\pi^2)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}$$

Γ(x) is the gamma function

log(x) is the natural logarithm

i is the imaginary unit

ϕ is the golden ratio

Result:

1729.0803743...

1729.0803743…

Alternative representations:

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=\frac{1}{2}+\frac{27}{2}\left(5-\frac{1}{\phi}+\frac{1}{4}\times 37.5635310811600\,\pi\cosh\left(\frac{1}{8}i\log(\pi^2)\right)\exp\left(-\log G\left(\frac{1}{4}(-1-i)\right)+\log G\left(1+\frac{1}{4}(-1-i)\right)\right)\exp\left(-\log G\left(\frac{1}{4}(-1+i)\right)+\log G\left(1+\frac{1}{4}(-1+i)\right)\right)\pi^{-3/4}\right)$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=\frac{1}{2}+\frac{27}{2}\left(5-\frac{1}{\phi}+\frac{37.5635310811600\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(\frac{1}{8}i\log(\pi^2)\right)\pi^{-3/4}}{4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)}\right)$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=\frac{1}{2}+\frac{27}{2}\left(5-\frac{1}{\phi}+\left(37.5635310811600\,\pi\,G\left(1+\frac{1}{4}(-1-i)\right)G\left(1+\frac{1}{4}(-1+i)\right)\cosh\left(-\frac{1}{8}i\log(\pi^2)\right)\pi^{-3/4}\right)\Big/\left(4\,G\left(\frac{1}{4}(-1-i)\right)G\left(\frac{1}{4}(-1+i)\right)\right)\right)$$

Series representations:

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=$$

$$\left(68.000000000000\left(0.198529411764706-1.00000000000000\,\phi-0.198529411764706\,i^2+1.00000000000000\,\phi\,i^2-29.829862917392\,\phi\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}\,4^{-3k_1-k_2-k_3}\,(-1-i)^{k_2}\,(-1+i)^{k_3}\,\log^{2k_1}(\pi^2)\,\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{(2k_1)!\,k_2!\,k_3!}\right)\right)\Big/(\phi\,(-1.00000000000000+1.00000000000000\,i)\,(1.00000000000000+1.00000000000000\,i))$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=\frac{1}{\phi}126.77691739892\left(-0.106486261671129+0.53637524397310\,\phi+1.00000000000000\,\phi\sqrt[4]{\pi}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{(2k_1)!\,k_2!\,k_3!}\left(-\frac{1}{64}\right)^{k_1}\log^{2k_1}(\pi^2)\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\right)\quad \text{for } (z_0\notin\mathbb{Z} \text{ or } z_0>0)$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=$$

$$\left(68.00000000000\left(0.19852941176471-1.00000000000000\,\phi-0.19852941176471\,i^2+1.00000000000000\,\phi\,i^2-29.829862917392\,\phi\sqrt[4]{\pi}\,J_0\left(\frac{\log(\pi^2)}{8}\right)\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}-59.659725834784\,\phi\sqrt[4]{\pi}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{(-1)^{k_1}\,4^{-k_2-k_3}(-1-i)^{k_2}(-1+i)^{k_3}\,J_{2k_1}\left(\frac{\log(\pi^2)}{8}\right)\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{k_2!\,k_3!}\right)\right)\Big/(\phi(-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i))$$

Integral representations:

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=68-\frac{27}{2\phi}-\frac{507.107669595660\,\pi^{9/4}\,\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{\frac{\pi}{2}}^{\frac{\log(\pi^2)}{8}}\sin(t)\,dt$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=68-\frac{27}{2\phi}+\frac{\pi^{9/4}\,\mathcal{A}^2\left(507.10766959566-63.388458699458\log(\pi^2)\int_0^1\sin\left(\frac{1}{8}\,t\log(\pi^2)\right)dt\right)}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=68-\frac{27}{2\phi}+\frac{253.553834797830\,\pi^{5/4}\,\mathcal{A}\sqrt{\pi}}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}\int_{-\mathcal{A}\infty+\gamma}^{\mathcal{A}\infty+\gamma}\frac{e^{s-\log^2(\pi^2)/(256s)}}{\sqrt{s}}\,ds \quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=68.000000000000-\frac{13.5000000000000}{\phi}+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\left(-22.4112044976749+44.8224089953498\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=68.000000000000-\frac{13.5000000000000}{\phi}+\frac{1}{\sqrt{\pi}^2}\sqrt[4]{\pi}\,\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{3}{8}-\frac{i}{8}\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{3+i}{8}\right)\left(22.4112044976749-44.8224089953498\sin^2\left(\frac{\log(\pi^2)}{16}\right)\right)$$

$$\frac{27}{2}\left(\frac{76}{4}\pi\left(\pi^{-3/4}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\cos\left(\frac{\log(\pi^2)}{8}\right)\right)\right)+5-\frac{1}{\phi}\right)+\frac{1}{2}=\frac{1}{2}+\frac{27}{2}\left(5-\frac{1}{\phi}+\frac{1}{\sqrt{\pi}^2}9.39088277029000\times 2^{-2+1/4(-1-i)+1/4(-1+i)}\sqrt[4]{\pi}\left(-1+2\cos^2\left(\frac{\log(\pi^2)}{16}\right)\right)\Gamma\left(\frac{1}{2}+\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{1}{2}+\frac{1}{8}(-1+i)\right)\Gamma\left(\frac{1}{8}(-1-i)\right)\Gamma\left(\frac{1}{8}(-1+i)\right)\right)$$

Now, we have that:

$$\alpha^{-\frac{1}{4}}\left\{\frac{1}{1-s}-4\alpha\int_0^\infty\left(\frac{1}{1+s}-\frac{\alpha}{1!}\frac{x^2}{3+s}+\frac{\alpha^2}{2!}\frac{x^4}{5+s}-\cdots\right)\frac{x\,dx}{e^{2\pi x}-1}\right\}$$
$$+\beta^{-\frac{1}{4}}\left\{\frac{1}{s}-4\beta\int_0^\infty\left(\frac{1}{2-s}-\frac{\beta}{1!}\frac{x^2}{4-s}+\frac{\beta^2}{2!}\frac{x^4}{6-s}-\cdots\right)\frac{x\,dx}{e^{2\pi x}-1}\right\}$$
$$=\frac{1}{2}\pi^{-\frac{3}{4}}\left(\frac{\alpha}{\beta}\right)^{\frac{1}{8}-\frac{1}{4}s}\Gamma\left(-\frac{s}{2}\right)\Gamma\left(\frac{s-1}{2}\right)\xi(s). \qquad (8)$$

For $t = 1$, $\alpha = 2$, $\beta = \pi^2 / 2$, and $\Xi(1/2\ t) = \xi(s) = 0.49425698791$, $s = (1/2+1/2i)$, we obtain:

1/2*Pi^(-3/4) * ((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i)) * ((gamma (-(1/2+1/2i)*1/2))) * ((gamma (((1/2+1/2i)-1)*1/2))) * (((0.49425698791)))

Input interpretation:

$$\frac{1}{2}\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4(1/2+1/2i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}i\right)\times\frac{1}{2}\right)\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}i\right)-1\right)\times\frac{1}{2}\right)\times 0.49425698791$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

1.0358559655... +
0.30481099408... i

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

Polar coordinates:

$r = 1.0797718849$ (radius), $\theta = 16.397047785°$ (angle)

1.0797718849

Alternative representations:

$$\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2 2}\right)^{1/8-1/4(1/2+i/2)}\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right) = 0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}$$

$$\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2 2}\right)^{1/8-1/4(1/2+i/2)}\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right) = 0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}$$

$$\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2 2}\right)^{1/8-1/4(1/2+i/2)}\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right) = 0.247128493955000\,e^{\log\Gamma(1/2(-1/2-i/2))}\,e^{\log\Gamma(1/2(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}$$

From which, we obtain:

((((1/2*Pi^(-3/4) * ((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i)) * ((gamma (-(1/2+1/2i)*1/2))) * ((gamma (((1/2+1/2i)-1)*1/2))) * (((0.49425698791)))))))^(2Pi)

Input interpretation:

$$\left(\frac{1}{2}\,\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4(1/2+1/2\,i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}\,i\right)\times\frac{1}{2}\right)\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}\,i\right)-1\right)\times\frac{1}{2}\right)\times 0.49425698791\right)^{2\pi}$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

$-0.3650579786... + 1.578011482... i$

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

Polar coordinates:

$r = 1.619687490$ (radius), $\theta = 103.0256897°$ (angle)

1.619687490

Alternative representations:

$$\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{2\pi} = \left(0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}\right)^{2\pi}$$

$$\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{2\pi} = \left(0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}\right)^{2\pi}$$

$$\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{2\pi} = \left(0.247128493955000\,e^{\log\Gamma(1/2(-1/2-i/2))}\,e^{\log\Gamma(1/2(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}\right)^{2\pi}$$

And again:

10^3*((((1/2*Pi^(-3/4) * ((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i)) * ((gamma (-(1/2+1/2i)*1/2))) * ((gamma (((1/2+1/2i)-1)*1/2))) * (((0.49425698791)))))))^(2Pi) +(123-11)i

Input interpretation:

$$10^3\left(\frac{1}{2}\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4(1/2+1/2i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}i\right)\times\frac{1}{2}\right)\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}i\right)-1\right)\times\frac{1}{2}\right)\times 0.49425698791\right)^{2\pi}+(123-11)i$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

$-365.0579786\ldots +$
$1690.011482\ldots i$

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

Polar coordinates:

$r = 1728.989918$ (radius), $\theta = 102.1891352°$ (angle)

1728.989918 ≈ 1729

Alternative representations:

$$10^3\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{2\pi}+(123-11)i = 112i+10^3\left(0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}\right)^{2\pi}$$

$$10^3\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{2\pi}+(123-11)i = 112i+10^3\left(0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}\right)^{2\pi}$$

$$10^3\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{2\pi}+(123-11)i = 112i+10^3\left(0.247128493955000\,e^{\log\Gamma(1/2(-1/2-i/2))}\,e^{\log\Gamma(1/2(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4(1/2+i/2)+1/8}\right)^{2\pi}$$

21*2((((1/2*Pi^(-3/4) * ((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i)) * ((gamma (-(1/2+1/2i)*1/2))) * ((gamma (((1/2+1/2i)-1)*1/2))) * (((0.49425698791)))))))^16+4i

Input interpretation:

$$21\times 2\left(\frac{1}{2}\,\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4\,(1/2+1/2\,i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}\,i\right)\times\frac{1}{2}\right)\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}\,i\right)-1\right)\times\frac{1}{2}\right)\times 0.49425698791\right)^{16}+4\,i$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

$-19.0832864\ldots - 138.128677\ldots\, i$

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

Polar coordinates:

$r = 139.440679$ (radius), $\theta = -97.8659541°$ (angle)

139.440679

Alternative representations:

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+4\,i =$$
$$4\,i+42\left(0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)^{16}$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+4\,i =$$
$$4\,i+42\left(0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)^{16}$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+4\,i=$$

$$4\,i+42\left(0.247128493955000\,e^{\log\Gamma(1/2\,(-1/2-i/2))}\,e^{\log\Gamma(1/2\,(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)^{16}$$

Series representations:

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+4\,i=$$

$$4\,i+\left(34.911966473250\left(\frac{1}{\pi^2}\right)^{2+4\,(-1/2-i/2)}\left(\sum_{k=0}^{\infty}\frac{2^{-k}\left(-\frac{1}{2}-\frac{i}{2}\right)^k\Gamma^{(k)}(1)}{k!}\right)^{16}\left(\sum_{k=0}^{\infty}\frac{2^{-k}\left(-\frac{1}{2}+\frac{i}{2}\right)^k\Gamma^{(k)}(1)}{k!}\right)^{16}\right)\Big/\left(\left(-\frac{1}{2}-\frac{i}{2}\right)^{16}\left(-\frac{1}{2}+\frac{i}{2}\right)^{16}\pi^{12}\right)$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+4\,i=$$

$$\frac{1}{\pi^{12}}4.00000000000\left(\frac{1}{\pi^2}\right)^{-2\,i}\left(1.000000000000\,i\left(\frac{1}{\pi^2}\right)^{2\,i}\pi^{12}+2.032143906297\times 10^{-9}\left(\sum_{k=0}^{\infty}\frac{4^{-k}\,(-1+i-4\,z_0)^k\,\Gamma^{(k)}(z_0)}{k!}\right)^{16}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^k\Gamma^{(k)}(z_0)}{k!}\right)^{16}\right)\quad\text{for }(z_0\notin\mathbb{Z}\text{ or }z_0>0)$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+4\,i\propto$$

$$4\,i+\left(8.128575625189\times 10^{-9}\times 2^{16+8\,(1/2-i/2)+8\,(1/2+i/2)}\,e^{8\,(1/2-i/2)+8\,(1/2+i/2)}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-8+8\,(-1/2-i/2)}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-8+8\,(-1/2+i/2)}\left(\frac{1}{\pi^2}\right)^{2+4\,(-1/2-i/2)}\sqrt{2\pi}^{32}\right)/\left(\pi^{12}\exp^{16}\left(-\sum_{k=0}^{\infty}\frac{2^{2k}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-1-2k}B_{2+2k}}{(1+k)(1+2k)}\right)\exp^{16}\left(-\sum_{k=0}^{\infty}\frac{2^{2k}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-1-2k}B_{2+2k}}{(1+k)(1+2k)}\right)\right)\ \text{for}\ \infty\to\frac{1}{2\sqrt{2}}$$

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

B_n is the n^{th} Bernoulli number

21*2((((1/2*Pi^(-3/4) * ((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i)) * ((gamma (-(1/2+1/2i)*1/2))) * ((gamma (((1/2+1/2i)-1)*1/2))) * (((0.49425698791)))))))^16+18i

Input interpretation:

$$21\times 2\left(\frac{1}{2}\,\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4\,(1/2+1/2\,i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}\,i\right)\times\frac{1}{2}\right)\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}\,i\right)-1\right)\times\frac{1}{2}\right)\times 0.49425698791\right)^{16}+18\,i$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

$-19.0832864\ldots-124.128677\ldots\,i$

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

Polar coordinates:

$r = 125.587022$ (radius), $\theta = -98.7401050°$ (angle)

125.587022

Alternative representations:

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+18\,i = 18\,i+42\left(0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)^{16}$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+18\,i = 18\,i+42\left(0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)^{16}$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+18\,i = 18\,i+42\left(0.247128493955000\,e^{\log\Gamma(1/2\,(-1/2-i/2))}\,e^{\log\Gamma(1/2\,(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)^{16}$$

Series representations:

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+18\,i = 18\,i+\left(34.911966473250\left(\frac{1}{\pi^2}\right)^{2+4\,(-1/2-i/2)}\left(\sum_{k=0}^{\infty}\frac{2^{-k}\left(-\frac{1}{2}-\frac{i}{2}\right)^k\Gamma^{(k)}(1)}{k!}\right)^{16}\left(\sum_{k=0}^{\infty}\frac{2^{-k}\left(-\frac{1}{2}+\frac{i}{2}\right)^k\Gamma^{(k)}(1)}{k!}\right)^{16}\right)\Big/\left(\left(-\frac{1}{2}-\frac{i}{2}\right)^{16}\left(-\frac{1}{2}+\frac{i}{2}\right)^{16}\pi^{12}\right)$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+18\,i =$$

$$\frac{1}{\pi^{12}}\,18.0000000000\left(\frac{1}{\pi^2}\right)^{-2\,i}\left(1.000000000000\,i\left(\frac{1}{\pi^2}\right)^{2\,i}\pi^{12}+4.515875347327\times 10^{-10}\left(\sum_{k=0}^{\infty}\frac{4^{-k}\,(-1+i-4\,z_0)^k\,\Gamma^{(k)}(z_0)}{k!}\right)^{16}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^k\,\Gamma^{(k)}(z_0)}{k!}\right)^{16}\right) \text{ for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$21\times 2\left(\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)^{16}+18\,i \propto$$

$$18\,i+\left(8.128575625189\times 10^{-9}\times 2^{16+8\,(1/2-i/2)+8\,(1/2+i/2)}\,e^{8\,(1/2-i/2)+8\,(1/2+i/2)}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-8+8\,(-1/2-i/2)}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-8+8\,(-1/2+i/2)}\left(\frac{1}{\pi^2}\right)^{2+4\,(-1/2-i/2)}\sqrt{2\,\pi}^{32}\right)\Big/$$

$$\left(\pi^{12}\exp^{16}\left(-\sum_{k=0}^{\infty}\frac{2^{2\,k}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-1-2\,k}B_{2+2\,k}}{(1+k)\,(1+2\,k)}\right)\exp^{16}\left(-\sum_{k=0}^{\infty}\frac{2^{2\,k}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-1-2\,k}B_{2+2\,k}}{(1+k)\,(1+2\,k)}\right)\right) \text{ for } \infty \to \frac{1}{2\sqrt{2}}$$

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

B_n is the n^{th} Bernoulli number

From the sum of the two results, we have:

1+1/(((((0.51792798277+(((1/2*Pi^(-3/4)*((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i))*((gamma (-(1/2+1/2i)*1/2)))*((gamma (((1/2+1/2i)-1)*1/2)))*(((0.49425698791))))))))))

Input interpretation:

$$1+1\Big/\left(0.51792798277+\frac{1}{2}\,\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4\,(1/2+1/2\,i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}\,i\right)\times\frac{1}{2}\right)\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}\,i\right)-1\right)\times\frac{1}{2}\right)\times 0.49425698791\right)$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

1.6197400568... −
0.12157647978... i

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

Polar coordinates:

$r = 1.6242963683$ (radius), $\theta = -4.292529308°$ (angle)

1.6242963683

Alternative representations:

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)=1+1\Big/\left(0.517927982770000+0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)=1+1\Big/\left(0.517927982770000+0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right.\right.$$
$$\left.\left.\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)=$$
$$1+1\Big/\left(0.517927982770000+0.247128493955000\,e^{\log\Gamma(1/2\,(-1/2-i/2))}\right.$$
$$\left.e^{\log\Gamma(1/2\,(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)$$

Series representations:

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right.\right.$$
$$\left.\left.\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)\propto$$
$$1+1\Big/\left(0.517927982770000+\frac{1}{\pi^{3/4}}0.698984935599997\sqrt{e}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-3/4-i/4}\right.$$
$$\left(-\frac{1}{2}+\frac{i}{2}\right)^{-3/4+i/4}\left(\frac{1}{\pi^2}\right)^{-i/8}\sqrt{2\pi}^{\,2}\left(1+\sum_{k=1}^{\infty}\sum_{j=1}^{2k}\frac{\left(-\frac{1}{2}\right)^j\left(-\frac{1}{2}-\frac{i}{2}\right)^{-k}\mathcal{D}_{2(j+k),j}}{(j+k)!}\right)$$
$$\left.\left(1+\sum_{k=1}^{\infty}\sum_{j=1}^{2k}\frac{\left(-\frac{1}{2}\right)^j\left(-\frac{1}{2}+\frac{i}{2}\right)^{-k}\mathcal{D}_{2(j+k),j}}{(j+k)!}\right)\right)$$
$$\text{for }\left(\left(\infty\to\frac{1}{2\sqrt{2}}\text{ and }\mathcal{D}_{n,j}=(-1+n)\left((-2+n)\,\mathcal{D}_{-3+n,-1+j}+\mathcal{D}_{-1+n,j}\right)\text{ and}\right.\right.$$
$$\left.\left.\mathcal{D}_{0,0}=1\text{ and }\mathcal{D}_{n,1}=(-1+n)!\text{ and }\mathcal{D}_{n,j}=0\right)\text{ for }n\le -1+3j\right)$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right.\right.$$
$$\left.\left.\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)=$$
$$\left(2.930770364350\left(-1.00000000000000\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}+\right.\right.$$
$$1.00000000000000\,i^2\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}-2.6049034922358$$
$$\left.\left.\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{2^{-k_1-k_2}\left(-\frac{1}{2}-\frac{i}{2}\right)^{k_1}\left(-\frac{1}{2}+\frac{i}{2}\right)^{k_2}\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}\right)\right)\Big/$$
$$\left(-1.0000000000000\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}+1.0000000000000\,i^2\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}-\right.$$
$$\left.7.634373957037\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{2^{-k_1-k_2}\left(-\frac{1}{2}-\frac{i}{2}\right)^{k_1}\left(-\frac{1}{2}+\frac{i}{2}\right)^{k_2}\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}\right)$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)=$$

$$\left(2.930770364350\left(1.0000000000000\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}+0.16280646826474\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)-z_0\right)^{k_1}\left(\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}\right)\right)\Big/$$

$$\left(1.0000000000000\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}+0.47714837231481\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)-z_0\right)^{k_1}\left(\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}\right)$$

for $(z_0 \notin \mathbb{Z}$ or $z_0 > 0)$

Integral representations:

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)=$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{\pi^{3/4}}0.247128493955000\left(\frac{1}{\pi^2}\right)^{-i/8}\left(\int_1^\infty e^{-t}\,t^{-5/4-i/4}\,dt+\sum_{k=0}^{\infty}-\frac{4(-1)^k}{(1+i-4k)\,k!}\right)\left(\int_1^\infty e^{-t}\,t^{1/4(-5+i)}\,dt+\sum_{k=0}^{\infty}\frac{4(-1)^k}{(-1+i+4k)\,k!}\right)\right)$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)=$$

$$1+\frac{1}{0.517927982770000+\frac{0.988513975820000\left(\frac{1}{\pi^2}\right)^{1/8+1/4(-1/2-i/2)}\pi^{5/4}\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/2(1/2-i/2)}\,dt}}$$

$$1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right.\right.$$
$$\left.\left.\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)=$$
$$\left(2.93077036435\left(1.000000000000\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}+\right.\right.$$
$$0.1628064682647\left(\int_0^\infty e^{-t}\,t^{-5/4-i/4}\left(1-e^t\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)$$
$$\left.\left.\int_0^\infty e^{-t}\,t^{1/4(-5+i)}\left(1-e^t\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)\right)\Big/$$
$$\left(1.000000000000\left(\frac{1}{\pi^2}\right)^{i/8}\pi^{3/4}+0.477148372315\right.$$
$$\left(\int_0^\infty e^{-t}\,t^{-5/4-i/4}\left(1-e^t\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)$$
$$\left.\int_0^\infty e^{-t}\,t^{1/4(-5+i)}\left(1-e^t\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)\quad\text{for}\left(n\in\mathbb{Z}\text{ and }0\le n<\frac{1}{4}\right)$$

or:

(((1+1/(((((0.51792798277+(((1/2*Pi^(-3/4)*((2/(Pi^2)/2))^(1/8-1/4*(1/2+1/2i))*((gamma (-(1/2+1/2i)*1/2)))*((gamma (((1/2+1/2i)-1)*1/2)))*(((0.49425698791)))))))))))))-(6/10^3)+(1/10^3)i

Input interpretation:

$$\left(1+1\Big/\left(0.51792798277+\frac{1}{2}\pi^{-3/4}\left(\frac{\frac{2}{\pi^2}}{2}\right)^{1/8-1/4(1/2+1/2\,i)}\Gamma\left(-\left(\frac{1}{2}+\frac{1}{2}\,i\right)\times\frac{1}{2}\right)\right.\right.$$
$$\left.\left.\Gamma\left(\left(\left(\frac{1}{2}+\frac{1}{2}\,i\right)-1\right)\times\frac{1}{2}\right)\times0.49425698791\right)\right)-\frac{6}{10^3}+\frac{1}{10^3}\,i$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

1.6137400568... −
0.12057647978... i

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

Polar coordinates:

$r = 1.6182384430$ (radius), $\theta = -4.273123039°$ (angle)

1.6182384430

Alternative representations:

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}=1-\frac{6}{10^3}+\frac{i}{10^3}+1\Big/\left(0.517927982770000+0.247128493955000\left(-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)\right)!\left(-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)\right)!\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)$$

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}=1-\frac{6}{10^3}+\frac{i}{10^3}+1\Big/\left(0.517927982770000+0.247128493955000\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}-\frac{i}{2}\right)}\,(1)_{-1+\frac{1}{2}\left(-\frac{1}{2}+\frac{i}{2}\right)}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)$$

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}=1-\frac{6}{10^3}+\frac{i}{10^3}+1\Big/\left(0.517927982770000+0.247128493955000\,e^{\log\Gamma(1/2\,(-1/2-i/2))}\,e^{\log\Gamma(1/2\,(-1/2+i/2))}\,\pi^{-3/4}\left(\frac{1}{\pi^2}\right)^{-1/4\,(1/2+i/2)+1/8}\right)$$

Series representations:

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}\propto \frac{497}{500}+\frac{i}{1000}+1\Big/\left(0.517927982770000+\frac{1}{\pi^{3/4}}\,0.698984935599997\sqrt{e}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-3/4-i/4}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-3/4+i/4}\left(\frac{1}{\pi^2}\right)^{-i/8}\exp\left(\sum_{k=0}^{\infty}\frac{2^{1+4k}(-1-i)^{-1-2k}B_{2+2k}}{(1+k)(1+2k)}\right)\exp\left(\sum_{k=0}^{\infty}\frac{2^{1+4k}(-1+i)^{-1-2k}B_{2+2k}}{1+3k+2k^2}\right)\sqrt{2\pi}^2\right) \text{ for } \infty\to\frac{1}{2\sqrt{2}}$$

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}\propto \frac{497}{500}+\frac{i}{1000}+1\Big/\left(0.517927982770000+\frac{1}{\pi^{3/4}}\,0.698984935599997\sqrt{e}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-3/4-i/4}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-3/4+i/4}\left(\frac{1}{\pi^2}\right)^{-i/8}\sqrt{2\pi}^2\left(1+\sum_{k=1}^{\infty}\sum_{j=1}^{2k}\frac{\left(-\frac{1}{2}\right)^j\left(-\frac{1}{2}-\frac{i}{2}\right)^{-k}\mathcal{D}_{2(j+k),j}}{(j+k)!}\right)\left(1+\sum_{k=1}^{\infty}\sum_{j=1}^{2k}\frac{\left(-\frac{1}{2}\right)^j\left(-\frac{1}{2}+\frac{i}{2}\right)^{-k}\mathcal{D}_{2(j+k),j}}{(j+k)!}\right)\right)$$

$$\text{for } \left(\left(\infty\to\frac{1}{2\sqrt{2}} \text{ and } \mathcal{D}_{n,j}=(-1+n)\left((-2+n)\,\mathcal{D}_{-3+n,-1+j}+\mathcal{D}_{-1+n,j}\right) \text{ and } \mathcal{D}_{0,0}=1 \text{ and } \mathcal{D}_{n,1}=(-1+n)! \text{ and } \mathcal{D}_{n,j}=0\right) \text{ for } n\le -1+3j\right)$$

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}\propto \frac{497}{500}+\frac{i}{1000}+1\Big/\left(0.517927982770000+\frac{0.698984935599997\sqrt{e}\left(-\frac{1}{2}-\frac{i}{2}\right)^{-3/4-i/4}\left(-\frac{1}{2}+\frac{i}{2}\right)^{-3/4+i/4}\left(\frac{1}{\pi^2}\right)^{-i/8}\sqrt{2\pi}^2}{\pi^{3/4}\exp\left(-\sum_{k=0}^{\infty}\frac{2^{1+4k}(-1-i)^{-1-2k}B_{2+2k}}{(1+k)(1+2k)}\right)\exp\left(-\sum_{k=0}^{\infty}\frac{2^{1+4k}(-1+i)^{-1-2k}B_{2+2k}}{1+3k+2k^2}\right)}\right) \text{ for } \infty\to\frac{1}{2\sqrt{2}}$$

B_n is the n^{th} Bernoulli number

Integral representations:

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}=\frac{497}{500}+\frac{i}{1000}+1\Big/\left(0.517927982770000+\frac{1}{\pi^{3/4}}\,0.247128493955000\left(\frac{1}{\pi^2}\right)^{-i/8}\left(\int_1^\infty e^{-t}\,t^{-5/4-i/4}\,dt+\sum_{k=0}^\infty-\frac{4\,(-1)^k}{(1+i-4\,k)\,k!}\right)\left(\int_1^\infty e^{-t}\,t^{1/4\,(-5+i)}\,dt+\sum_{k=0}^\infty\frac{4\,(-1)^k}{(-1+i+4\,k)\,k!}\right)\right)$$

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}=\frac{497}{500}+\frac{i}{1000}+\frac{1}{0.517927982770000+\frac{0.988513975820000\left(\frac{1}{\pi^2}\right)^{1/8+1/4\,(-1/2-i/2)}\pi^{5/4}\,\mathcal{A}^2}{\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/2\,(1/2-i/2)}\,dt}}$$

$$\left(1+1\Big/\left(0.517927982770000+\frac{1}{2}\left(\pi^{-3/4}\left(\frac{2}{\pi^2\,2}\right)^{1/8-1/4\,(1/2+i/2)}\right)\Gamma\left(-\frac{1}{2}\left(\frac{1}{2}+\frac{i}{2}\right)\right)\left(\Gamma\left(\frac{1}{2}\left(\left(\frac{1}{2}+\frac{i}{2}\right)-1\right)\right)0.494256987910000\right)\right)\right)-\frac{6}{10^3}+\frac{i}{10^3}=\frac{497}{500}+\frac{i}{1000}+\frac{1}{0.517927982770000+\frac{0.988513975820000\left(\frac{1}{\pi^2}\right)^{1/8+1/4\,(-1/2-i/2)}\pi^{5/4}}{\mathcal{A}^2\oint_L e^{-t}\,(-t)^{1/4+i/4}\,dt\oint_L e^{-t}\,(-t)^{1/2\,(1/2-i/2)}\,dt}}$$

Now, we have that:

$$\int_0^\infty\left\{e^{-z}-4\pi\int_0^\infty\frac{xe^{-3z-\pi x^2e^{-4z}}}{e^{2\pi x}-1}\,dx\right\}\cos tz\,dz=\frac{1}{8\sqrt{\pi}}\Gamma\left(\frac{-1+it}{4}\right)\Gamma\left(\frac{-1-it}{4}\right)\Xi(\frac{1}{2}t). \qquad (12)$$

For t = 1 and Ξ(1/2 t) = 0.49425698791 , we obtain:

1/(8sqrtPi) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791

Input interpretation:

$$\frac{1}{8\sqrt{\pi}}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791$$

Γ(x) is the gamma function

i is the imaginary unit

Result:

0.35938462381...

0.35938462381…

Alternative representations:

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{0.494256987910000\left(-1+\frac{1}{4}(-1-i)\right)!\left(-1+\frac{1}{4}(-1+i)\right)!}{8\sqrt{\pi}}$$

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{0.494256987910000\,(1)_{-1+\frac{1}{4}(-1-i)}\,(1)_{-1+\frac{1}{4}(-1+i)}}{8\sqrt{\pi}}$$

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{0.494256987910000\,e^{\log\Gamma(1/4(-1-i))}\,e^{\log\Gamma(1/4(-1+i))}}{8\sqrt{\pi}}$$

Series representations:

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{0.0617821234887500\,\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)}{\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}} \quad \text{for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = -\left(\left(0.9885139758200\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}\right)\Big/\left((-1.00000000000000+1.00000000000000\,i)(1.00000000000000+1.00000000000000\,i)\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\right)$$

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{0.0617821234887500\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}}{\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}}$$

for $(z_0 \notin \mathbb{Z}$ or $z_0 > 0)$

Integral representations:

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{1}{\sqrt{\pi}}0.0617821234887500\,\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt$$

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{1}{\sqrt{\pi}}0.0617821234887500\left(\int_0^{\infty}t^{-5/4-i/4}\left(e^{-t}-\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)\int_0^{\infty}t^{1/4(-5+i)}\left(e^{-t}-\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt \quad \text{for } \left(n \in \mathbb{Z} \text{ and } 0 \le n < \frac{1}{4}\right)$$

$$\frac{\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000}{8\sqrt{\pi}} = \frac{0.247128493955000\,\pi^2\,\mathcal{A}^2}{\sqrt{\pi}\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

csc(x) is the cosecant function

From which, we obtain:

(2+sqrt7) * (((1/(8sqrtPi) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791)))-(29-4)1/10^3

Input interpretation:

$$\left(2+\sqrt{7}\right)\left(\frac{1}{8\sqrt{\pi}}\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\right)-(29-4)\times\frac{1}{10^3}$$

Γ(x) is the gamma function

i is the imaginary unit

Result:

1.6446115872...

1.6446115872…

Alternative representations:

$$\frac{\left(2+\sqrt{7}\right)\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{29-4}{10^3} = -\frac{25}{10^3}+\frac{0.494256987910000\left(-1+\frac{1}{4}(-1-i)\right)!\left(-1+\frac{1}{4}(-1+i)\right)!\left(2+\sqrt{7}\right)}{8\sqrt{\pi}}$$

$$\frac{\left(2+\sqrt{7}\right)\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{29-4}{10^3} = -\frac{25}{10^3}+\frac{0.494256987910000\,(1)_{-1+\frac{1}{4}(-1-i)}\,(1)_{-1+\frac{1}{4}(-1+i)}\left(2+\sqrt{7}\right)}{8\sqrt{\pi}}$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{29-4}{10^3}=$$
$$-\frac{25}{10^3}+\frac{0.494256987910000\,e^{\log\Gamma(1/4(-1-i))}\,e^{\log\Gamma(1/4(-1+i))}\,(2+\sqrt{7})}{8\sqrt{\pi}}$$

Series representations:

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{29-4}{10^3}=$$
$$-\left(\left(0.025000000000000\left(-4.9425698791000\,\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)-2.47128493955000\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(7-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+1.00000000000000\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Big/\left(\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\text{ for }(x\in\mathbb{R}\text{ and }x<0)$$

$$\frac{\left(2+\sqrt{7}\right)\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{29-4}{10^3}=$$

$$-\Bigg(\Bigg(0.02500000000000\Bigg(-1.0000000000000\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}+$$

$$1.0000000000000\, i^2\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}+79.08111806560$$

$$\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}+$$

$$39.540559032800\sqrt{6}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}$$

$$\frac{2^{-k_1-2k_2-2k_3}\times 3^{-k_1}(-1-i)^{k_2}(-1+i)^{k_3}\binom{\frac{1}{2}}{k_1}\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{k_2!\,k_3!}\Bigg)$$

$$\Bigg)\Big/\Bigg((-1.0000000000000+1.0000000000000\, i)$$

$$(1.0000000000000+1.0000000000000\, i)\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\Bigg)\Bigg)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}} - \frac{29-4}{10^3} =$$

$$-\left(\left(0.025000000000000\left(1.00000000000000\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k} - 4.9425698791000\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!} - 2.47128493955000\sqrt{6}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{k_2!\,k_3!}6^{-k_1}\binom{\frac{1}{2}}{k_1}\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\right)\right)\Big/\left(\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\right) \text{ for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

Integral representations:

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}} - \frac{29-4}{10^3} =$$

$$-\frac{1}{40} + \frac{1}{\sqrt{\pi}}0.0617821234887500\left(2.00000000000000+\sqrt{7}\right)\left(\int_1^{\infty}e^{-t}\,t^{-5/4-i/4}\,dt - 4\sum_{k=0}^{\infty}\frac{(-1)^k}{(1+i-4k)\,k!}\right)\left(\int_1^{\infty}e^{-t}\,t^{1/4(-5+i)}\,dt + 4\sum_{k=0}^{\infty}\frac{(-1)^k}{(-1+i+4k)\,k!}\right)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}} - \frac{29-4}{10^3} =$$

$$\frac{1}{\sqrt{\pi}}0.06178212348875\left(2.0000000000000\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt + 1.00000000000000\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\left(\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt\right)\sqrt{7} - 0.40464779435029\sqrt{\pi}\right)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{29-4}{10^3}=$$
$$-\frac{1}{40}+\frac{0.247128493955000\,\pi^2\,\mathcal{A}^2\,(2+\sqrt{7})}{\sqrt{\pi}\,\oint_L e^t\,t^{1/4+i/4}\,dt\,\oint_L e^t\,t^{1/4-i/4}\,dt}$$

(2+sqrt7) * (((1/(8sqrtPi) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791)))-(55-3)1/10^3

Input interpretation:

$$(2+\sqrt{7})\left(\frac{1}{8\sqrt{\pi}}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\right)-(55-3)\times\frac{1}{10^3}$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

1.6176115872...

1.6176115872…

Alternative representations:

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{55-3}{10^3}=$$
$$-\frac{52}{10^3}+\frac{0.494256987910000\left(-1+\frac{1}{4}(-1-i)\right)!\left(-1+\frac{1}{4}(-1+i)\right)!\,(2+\sqrt{7})}{8\sqrt{\pi}}$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{55-3}{10^3}=$$
$$-\frac{52}{10^3}+\frac{0.494256987910000\,(1)_{-1+\frac{1}{4}(-1-i)}\,(1)_{-1+\frac{1}{4}(-1+i)}\,(2+\sqrt{7})}{8\sqrt{\pi}}$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{55-3}{10^3}=$$
$$-\frac{52}{10^3}+\frac{0.494256987910000\,e^{\log\Gamma(1/4(-1-i))}\,e^{\log\Gamma(1/4(-1+i))}\,(2+\sqrt{7})}{8\sqrt{\pi}}$$

Series representations:

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}} - \frac{55-3}{10^3} =$$

$$-\left(\left(0.052000000000000\left(-2.37623551879808\,\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right) - 1.18811775939904\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(7-x)}{2\pi}\right\rfloor\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (7-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} + 1.00000000000000\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)\Bigg/\left(\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right) \quad \text{for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}} - \frac{55-3}{10^3} =$$

$$-\left(\left(0.05200000000000\left(-1.0000000000000\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}+\right.\right.\right.$$

$$1.0000000000000\,i^2\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}+38.019768300769$$

$$\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\,\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}+$$

$$19.009884150385\sqrt{6}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}$$

$$\left.\frac{2^{-k_1-2k_2-2k_3}\times 3^{-k_1}(-1-i)^{k_2}(-1+i)^{k_3}\binom{\frac{1}{2}}{k_1}\Gamma^{(k_2)}(1)\,\Gamma^{(k_3)}(1)}{k_2!\,k_3!}\right)$$

$$\left.\right)\Big/\left((-1.0000000000000+1.0000000000000\,i)\right.$$

$$\left.\left.(1.0000000000000+1.0000000000000\,i)\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\right)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{55-3}{10^3}=$$

$$-\Bigg(\Bigg(0.052000000000000\Bigg(1.00000000000000\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}-2.37623551879808\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}-1.18811775939904\sqrt{6}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\sum_{k_3=0}^{\infty}\frac{1}{k_2!\,k_3!}6^{-k_1}\binom{\frac{1}{2}}{k_1}\left(\frac{1}{4}(-1+i)-z_0\right)^{k_2}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_3}\Gamma^{(k_2)}(z_0)\,\Gamma^{(k_3)}(z_0)\Bigg)\Bigg)\Bigg/\left(\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\Bigg)\quad \text{for } (z_0\notin\mathbb{Z} \text{ or } z_0>0)$$

Integral representations:

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{55-3}{10^3}=$$

$$-\frac{13}{250}+\frac{1}{\sqrt{\pi}}0.0617821234887500\left(2.00000000000000+\sqrt{7}\right)\left(\int_1^{\infty}e^{-t}\,t^{-5/4-i/4}\,dt-4\sum_{k=0}^{\infty}\frac{(-1)^k}{(1+i-4k)\,k!}\right)\left(\int_1^{\infty}e^{-t}\,t^{1/4(-5+i)}\,dt+4\sum_{k=0}^{\infty}\frac{(-1)^k}{(-1+i+4k)\,k!}\right)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-\frac{55-3}{10^3}=$$

$$\frac{1}{\sqrt{\pi}}0.06178212348875\Bigg(2.0000000000000\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt+1.00000000000000\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\left(\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt\right)\sqrt{7}-0.84166741224861\sqrt{\pi}\Bigg)$$

$$\frac{(2+\sqrt{7})\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}} - \frac{55-3}{10^3} = -\frac{13}{250} + \frac{0.247128493955000\,\pi^2\,\mathcal{A}^2\,(2+\sqrt{7})}{\sqrt{\pi}\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

5* 10^3(((1/(8sqrtPi) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791)))-76+7+1/golden ratio+1/2

Input interpretation:

$$5\times10^3\left(\frac{1}{8\sqrt{\pi}}\,\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times0.49425698791\right)-76+7+\frac{1}{\phi}+\frac{1}{2}$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

ϕ is the golden ratio

Result:

1729.0411530...

1729.0411530…

Alternative representations:

$$\frac{(5\times10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2} = -\frac{137}{2}+\frac{1}{\phi}+\frac{2.47128493955000\left(-1+\frac{1}{4}(-1-i)\right)!\left(-1+\frac{1}{4}(-1+i)\right)!\,10^3}{8\sqrt{\pi}}$$

$$\frac{(5\times10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2} = -\frac{137}{2}+\frac{1}{\phi}+\frac{2.47128493955000\,(1)_{-1+\frac{1}{4}(-1-i)}\,(1)_{-1+\frac{1}{4}(-1+i)}\,10^3}{8\sqrt{\pi}}$$

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$

$$-\frac{137}{2}+\frac{1}{\phi}+\frac{2.47128493955000\times 10^3\, e^{\log\Gamma(1/4(-1-i))}\, e^{\log\Gamma(1/4(-1+i))}}{8\sqrt{\pi}}$$

Series representations:

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$

$$-\frac{137}{2}+\frac{1}{\phi}+\frac{308.910617443750\,\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)}{\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}}\quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$

$$-\Bigg(\Bigg(68.5000000000000\Bigg(-0.0145985401459854\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}+1.00000000000000\,\phi\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}-4.5096440502737\,\phi\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}\Bigg)\Bigg)\Bigg/\left(\phi\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\Bigg)\quad \text{for } (z_0\notin\mathbb{Z} \text{ or } z_0>0)$$

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$

$$-\frac{137}{2}+\frac{1}{\phi}+\left(4942.56987910000\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(\pi-z_0)/(2\pi)\rfloor} z_0^{1/2(-1-\lfloor\arg(\pi-z_0)/(2\pi)\rfloor)}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}\right)\Bigg/\left((-1-i)(-1+i)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\pi-z_0)^k z_0^{-k}}{k!}\right)$$

Integral representations:

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$
$$\frac{1}{\phi\sqrt{\pi}}308.91061744375\left(1.00000000000000\,\phi\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^\infty t^{-5/4-i/4}\sin(t)\,dt\right)\int_0^\infty t^{1/4(-5+i)}\sin(t)\,dt+0.0032371823548023\sqrt{\pi}-0.22174699130396\,\phi\sqrt{\pi}\right)$$

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$
$$-\frac{1}{\phi\sqrt{\pi}}68.5000000000\left(-4.509644050274\,\phi\left(\int_0^\infty t^{-5/4-i/4}\left(e^{-t}-\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)\int_0^\infty t^{1/4(-5+i)}\left(e^{-t}-\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt-0.014598540145985\sqrt{\pi}+1.0000000000000\,\phi\sqrt{\pi}\right)\text{ for }\left(n\in\mathbb{Z}\text{ and }0\le n<\frac{1}{4}\right)$$

$$\frac{(5\times 10^3)\,\Gamma\left(\frac{1}{4}(-1+i)\right)\left(\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{8\sqrt{\pi}}-76+7+\frac{1}{\phi}+\frac{1}{2}=$$
$$-\frac{137}{2}+\frac{1}{\phi}+\frac{1235.64246977500\,\pi^2\,\mathcal{A}^2}{\sqrt{\pi}\oint_L e^t\,t^{1/4+i/4}\,dt\oint_L e^t\,t^{1/4-i/4}\,dt}$$

1/3 *10^3(((1/(8sqrtPi) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791))+21+2-Pi

Input interpretation:

$$\frac{1}{3}\times 10^3\left(\frac{1}{8\sqrt{\pi}}\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)\times 0.49425698791\right)+21+2-\pi$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

Result:

139.65328195…

139.65328195…

Alternative representations:

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{\left(8\sqrt{\pi}\right)3}+21+2-\pi = 23-\pi+\frac{0.164752329303333\left(-1+\frac{1}{4}(-1-i)\right)!\left(-1+\frac{1}{4}(-1+i)\right)!\,10^3}{8\sqrt{\pi}}$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{\left(8\sqrt{\pi}\right)3}+21+2-\pi = 23-\pi+\frac{0.164752329303333\,(1)_{-1+\frac{1}{4}(-1-i)}\,(1)_{-1+\frac{1}{4}(-1+i)}\,10^3}{8\sqrt{\pi}}$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{\left(8\sqrt{\pi}\right)3}+21+2-\pi = 23-\pi+\frac{0.164752329303333\times 10^3\, e^{\log\Gamma(1/4(-1-i))}\, e^{\log\Gamma(1/4(-1+i))}}{8\sqrt{\pi}}$$

Series representations:

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{\left(8\sqrt{\pi}\right)3}+21+2-\pi = 23-\pi+\frac{20.5940411629167\,\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)}{\exp\left(\pi\,\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\,\sum_{k=0}^{\infty}\frac{(-1)^k(\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}} \quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+21+2-\pi =$$

$$-\left(\left(1.0000000000000\left(-23.0000000000000\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}+1.00000000000000\,\pi\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}-20.5940411629167\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\,\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}\right)\right)\Big/\left(\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\right) \text{ for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+21+2-\pi =$$

$$23-\pi+\left(329.504658606667\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(\pi-z_0)/(2\pi)\rfloor}z_0^{1/2(-1-\lfloor\arg(\pi-z_0)/(2\pi)\rfloor)}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\Gamma^{(k_1)}(1)\,\Gamma^{(k_2)}(1)}{k_1!\,k_2!}\right)\Big/\left((-1-i)(-1+i)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\pi-z_0)^k z_0^{-k}}{k!}\right)$$

Integral representations:

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+21+2-\pi =$$

$$-\frac{1}{\sqrt{\pi}}1.0000000000000\left(-20.5940411629167\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt-23.0000000000000\sqrt{\pi}+1.00000000000000\,\pi\sqrt{\pi}\right)$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})\,3} + 21 + 2 - \pi =$$

$$-\frac{1}{\sqrt{\pi}} 1.0000000000000 \left(-20.594041162917 \left(\int_0^\infty t^{-5/4-i/4}\left(e^{-t} - \sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right) \int_0^\infty t^{1/4(-5+i)}\left(e^{-t} - \sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt - 23.000000000000\sqrt{\pi} + 1.0000000000000\,\pi\sqrt{\pi}\right) \text{ for } \left(n \in \mathbb{Z} \text{ and } 0 \le n < \frac{1}{4}\right)$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})\,3} + 21 + 2 - \pi =$$

$$23 - \pi + \frac{82.3761646516667\,\pi^2 \mathcal{A}^2}{\sqrt{\pi}\oint_L e^t\, t^{1/4+i/4}\,dt \oint_L e^t\, t^{1/4-i/4}\,dt}$$

1/3 *10^3(((1/(8sqrtPi) * gamma ((-1+i)/4) * gamma ((-1-i)/4) * 0.49425698791)))+7-golden ratio

Input interpretation:

$$\frac{1}{3} \times 10^3 \left(\frac{1}{8\sqrt{\pi}}\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right) \times 0.49425698791\right) + 7 - \phi$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

ϕ is the golden ratio

Result:

125.17684061...

125.17684061…

Alternative representations:

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3} + 7 - \phi = 7 - \phi + \frac{0.164752329303333\left(-1+\frac{1}{4}(-1-i)\right)!\left(-1+\frac{1}{4}(-1+i)\right)!\,10^3}{8\sqrt{\pi}}$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3} + 7 - \phi = 7 - \phi + \frac{0.164752329303333\,(1)_{-1+\frac{1}{4}(-1-i)}\,(1)_{-1+\frac{1}{4}(-1+i)}\,10^3}{8\sqrt{\pi}}$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3} + 7 - \phi = 7 - \phi + \frac{0.164752329303333 \times 10^3\, e^{\log\Gamma(1/4(-1-i))}\, e^{\log\Gamma(1/4(-1+i))}}{8\sqrt{\pi}}$$

Series representations:

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3} + 7 - \phi = 7 - \phi + \frac{20.5940411629167\,\Gamma\left(\frac{1}{4}(-1-i)\right)\Gamma\left(\frac{1}{4}(-1+i)\right)}{\exp\left(\pi\mathcal{A}\left\lfloor\frac{\arg(\pi-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(\pi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}} \quad \text{for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$\frac{10^3 \left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3} + 7 - \phi = -\left(\left(1.0000000000000\left(-7.0000000000000\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k} + 1.00000000000000\,\phi\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k} - 20.5940411629167\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{\left(\frac{1}{4}(-1+i)-z_0\right)^{k_1}\left(-\frac{1}{4}-\frac{i}{4}-z_0\right)^{k_2}\Gamma^{(k_1)}(z_0)\Gamma^{(k_2)}(z_0)}{k_1!\,k_2!}\right)\right)\Big/\left(\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\right) \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+7-\phi=$$

$$7-\phi+\left(329.504658606667\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(\pi-z_0)/(2\pi)\rfloor} z_0^{1/2(-1-\lfloor\arg(\pi-z_0)/(2\pi)\rfloor)}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{4^{-k_1-k_2}(-1-i)^{k_1}(-1+i)^{k_2}\Gamma^{(k_1)}(1)\Gamma^{(k_2)}(1)}{k_1!k_2!}\right)\Bigg/\left((-1-i)(-1+i)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\pi-z_0)^k z_0^{-k}}{k!}\right)$$

Integral representations:

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+7-\phi=$$

$$-\frac{1}{\sqrt{\pi}}1.0000000000000\left(-20.5940411629167\csc\left(\frac{1}{8}(-1+i)\pi\right)\csc\left(-\frac{1}{8}(1+i)\pi\right)\left(\int_0^{\infty}t^{-5/4-i/4}\sin(t)\,dt\right)\int_0^{\infty}t^{1/4(-5+i)}\sin(t)\,dt-7.0000000000000\sqrt{\pi}+1.00000000000000\phi\sqrt{\pi}\right)$$

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+7-\phi=$$

$$-\frac{1}{\sqrt{\pi}}1.0000000000000\left(-20.594041162917\left(\int_0^{\infty}t^{-5/4-i/4}\left(e^{-t}-\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt\right)\int_0^{\infty}t^{1/4(-5+i)}\left(e^{-t}-\sum_{k=0}^{n}\frac{(-t)^k}{k!}\right)dt-7.000000000000\sqrt{\pi}+1.0000000000000\phi\sqrt{\pi}\right)\text{ for }\left(n\in\mathbb{Z}\text{ and }0\le n<\frac{1}{4}\right)$$

$$\frac{10^3\left(\Gamma\left(\frac{1}{4}(-1+i)\right)\Gamma\left(\frac{1}{4}(-1-i)\right)0.494256987910000\right)}{(8\sqrt{\pi})3}+7-\phi=$$

$$7-\phi+\frac{82.3761646516667\pi^2\mathcal{A}^2}{\sqrt{\pi}\oint_L e^t t^{1/4+i/4}\,dt\oint_L e^t t^{1/4-i/4}\,dt}$$

Observations

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

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

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

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

From Wikipedia

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

Can be this the motivation that from the development of the Ramanujan's equations we obtain results very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV and practically equal to the rest mass of Pion meson 139.57 MeV

Note that:

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

Hence

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

so that

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

Hence

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

Thence:

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

And

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

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

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

All the results of the most important connections are signed in blue throughout the drafting of the paper. We highlight as in the development of the various equations we use always the constants π, ϕ, 1/ϕ, the Fibonacci and Lucas numbers, linked to the *golden ratio, that play a fundamental role in the development, and therefore, in the final results of the analyzed expressions.*

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

The beginning of the sequence is thus:

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

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

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

The sequence of Lucas numbers is:

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

All Fibonacci-like integer sequences appear in shifted form as a row of the Wythoff array; the Fibonacci sequence itself is the first row and the Lucas sequence is the *second row. Also like all Fibonacci-like integer sequences, the ratio between two consecutive Lucas numbers converges to the golden ratio.*

A Lucas prime is a Lucas number that is prime. The first few Lucas primes are:
2, 3, 7, 11, 29, 47, 199, 521, 2207, 3571, 9349, 3010349, 54018521, 370248451, 6643838879, ... (sequence A005479 in the OEIS).

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

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

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

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

References

New expressions for Riemann's functions $\xi(s)$ and $\Xi(t)$ – *Srinivasa Ramanujan*
Quarterly Journal of Mathematics, XLVI, 1915, 253 – 260