On the possible mathematical connections between some equations of certain Dirichlet series, some equations of D-Branes and Rogers-Ramanujan formulas that link π, e and the Golden Ratio. I

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Abstract

In this research thesis, we have described some new mathematical connections between some equations of certain Dirichlet series, some equations of D-Branes and Rogers-Ramanujan formulas that link π, e and ϕ.

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Behaviour of the argument of the Riemann zeta function on the critical line

A. A. Karatsuba and M. A. Korolev

§ 2. Approximation of the function *S(t)* by a segment of a Dirichlet series

Let $N(\sigma, T)$ be the number of zeros of the Riemann zeta function $\zeta(s)$ in the domain $\sigma < \operatorname{Re} s \leqslant 1$, $0 < \operatorname{Im} s \leqslant T$. If $T^a \leqslant H \leqslant T$, where a is a fixed number with $1/2 < a \leqslant 1$, then the estimate

$$N(\sigma, T+H) - N(\sigma, T) = O\biggl(H(\log T)\Bigl(\frac{H}{\sqrt{T}}\Bigr)^{-\frac{1}{2}(\sigma-\frac{1}{2})}\biggr)$$

holds uniformly for $1/2 \leqslant \sigma \leqslant 1$.

In §§ 1–3 we use the following notation: ε is an arbitrarily small fixed number such that $0 < \varepsilon < 0.001$, $T \geqslant T_0(\varepsilon) > 0$, $H = T^{27/82+\varepsilon}$, $L = \log T$, $k = [L]$, $H_1 = HL^{-1}$, $\Delta = {H_1}^{1}L$, $x = T^{0.1\varepsilon}$, and $D = (2H_1)^k$.

For any T and any σ with $0 \leqslant \sigma \leqslant 1$

Let $0 \leqslant \sigma \leqslant 1$ and let γ range over all rational fractions whose numerator and denominator are positive and do not exceed x. We denote by $r = r(\sigma; T, H, P, x)$ the sum

$$r = \sum_{\gamma} \int_{-2H}^{2H} \int_{-H_1}^{H_1} \cdots \int_{-H_1}^{H_1} |W(\sigma, T_1; \alpha)| \, dt \, dt_1 \cdots dt_k,$$

If $h \geqslant 1$, then $|h + \xi - \eta| \geqslant 1 - (1 - x^{-1}) = x^{-1} > x^{-2}$.

For $0.5 \leqslant \sigma \leqslant 1$ we define numbers $\delta_\nu = \delta_\nu(\sigma)$, $1 \leqslant \nu \leqslant x$, by the equalities

Let $s = \sigma + it$, where $0.5 \leqslant \sigma \leqslant 1$, $y \geqslant 1$, $z \geqslant 1$, and $t = 2\pi yz$.

$P = \sqrt{T/(2\pi)}$.

We have that:

$$I = \int_T^{T+H} (\sigma_{z,t} - 0.5)^\nu \xi^{\sigma_{z,t}-0.5}\, dt$$

satisfies the estimate

$$I < H \frac{(2e)^{8m}}{(\log z)^\nu} \left(1 + \frac{\nu!}{32} \left(\frac{\log z}{\log x}\right)^\nu \frac{\log T}{\log z}\right).$$

For:

H = $T^{27/82+\varepsilon}$; T = 2; z = 3, ν = 1.0012; m = 1; x = $T^{0.1\varepsilon}$ ε = 1/24 = 0,04166666;

x = 1.002893; H = 1,256230382233478, we obtain:

1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3)))

Input interpretation:

$$1.25623 \times \frac{(2\,e)^8}{\log^{1.0012}(3)} \left(1 + \frac{1.0012!}{32} \left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012} \times \frac{\log(2)}{\log(3)}\right)$$

log(x) is the natural logarithm

n! is the factorial function

Result:

$7.4648993091294895809816190145432852532124983492852275 7... \times 10^6$

7.464899309… * 10^6 = 7464899.309….

Alternative representations:

$$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2\,e)^8}{\log^{1.0012}(3)} = \frac{1.25623\,(2\,e)^8\left(1+\frac{0.0012!! \times 1.0012!!\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}}{32\log(3)}\right)}{\log^{1.0012}(3)}$$

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$$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} = \frac{1.25623\,(2e)^8\left(1+\frac{\log_e(2)\,(1)_{1.0012}\left(\frac{\log_e(3)}{\log_e(1.00289)}\right)^{1.0012}}{32\log_e(3)}\right)}{\log_e^{1.0012}(3)}$$

- $$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} = \frac{1.25623\,(2e)^8\left(1+\frac{0.0012!!\times 1.0012!!\log_e(2)\left(\frac{\log_e(3)}{\log_e(1.00289)}\right)^{1.0012}}{32\log_e(3)}\right)}{\log_e^{1.0012}(3)}$$

$n!!$ is the double factorial function
$\log_b(x)$ is the base- b logarithm
$(a)_n$ is the Pochhammer symbol (rising factorial)

Series representations:

$$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} = \frac{321.595\,e^8}{\log^{1.0012}(3)} + \frac{10.0498\,e^8\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}}{\log^{2.0012}(3)}$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 1.0012)$

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$$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} =$$

$$\Bigg(10.0498\Bigg(32\,e^8\left(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\right)^{2.0012}+2\,e^8\,i\,\pi$$

$$\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\left(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\right)^{1.0012}$$

$$\left(\frac{2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}}{2\,i\,\pi\left\lfloor\frac{\arg(1.00289-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-x)^k\,x^{-k}}{k}}\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+$$

$$e^8\log(x)\left(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\right)^{1.0012}$$

$$\left(\frac{2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}}{2\,i\,\pi\left\lfloor\frac{\arg(1.00289-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-x)^k\,x^{-k}}{k}}\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-$$

$$e^8\Bigg(\left(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\right)^{1.0012}$$

$$\left(\frac{2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}}{2\,i\,\pi\left\lfloor\frac{\arg(1.00289-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-x)^k\,x^{-k}}{k}}\right)^{1.0012}$$

$$\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\,(2-x)^{k_1}\,x^{-k_1}\,(1.0012-n_0)^{k_2}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\right)^{3.0024}$$

for (($n_0 \notin \mathbb{Z}$ or $n_0 \geq 0$) and
$x < 0$
and
$n_0 \to 1.0012$)

$$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}=\Bigg(10.0498$$

$$\Bigg(32\,e^8\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{2.0012}+$$

$$2\,e^8\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{2}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor$$

$$\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012}$$

$$\left(\frac{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}}{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}}\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+e^8\log(z_0)$$

$$\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012}$$

$$\left(\frac{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}}{2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}}\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-$$

$$e^8\Bigg(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012}$$

$$\Bigg(\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)\Big/$$

$$\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\right.$$

$$\left.\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}\right)\Bigg)^{1.0012}$$

$$\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\,(1.0012-n_0)^{k_2}\,(2-z_0)^{k_1}\,z_0^{-k_1}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\Bigg)\Bigg)\Bigg)\Big/$$

$$\left(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{3.0024}$$

for
$((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$
and
$n_0 \to 1.0012)$

$$
\begin{aligned}
&\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2\,e)^8}{\log^{1.0012}(3)} = \\
&\Bigg(10.0498\Bigg(32\,e^8\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{2.0012}+ \\
&\quad e^8\left\lfloor\frac{\arg(2-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012} \\
&\quad\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)\Big/\right. \\
&\quad\left.\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}\right)\right)^{1.0012} \\
&\quad\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+e^8\log(z_0) \\
&\quad\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012} \\
&\quad\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)\Big/\right. \\
&\quad\left.\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}\right)\right)^{1.0012} \\
&\quad\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+e^8\left\lfloor\frac{\arg(2-z_0)}{2\,\pi}\right\rfloor\log(z_0) \\
&\quad\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012} \\
&\quad\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)\Big/\right. \\
&\quad\left.\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}\right)\right)^{1.0012} \\
&\quad\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-e^8\Bigg(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\right. \\
&\qquad\left.\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{1.0012} \\
&\qquad\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)\Big/\right. \\
&\qquad\left.\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-z_0)^k\,z_0^{-k}}{k}\right)\right)^{1.0012} \\
&\qquad\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}\,(1.0012-n_0)^{k_2}\,(2-z_0)^{k_1}\,z_0^{-k_1}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\Bigg)\Bigg)\Bigg)\Big/ \\
&\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-z_0)^k\,z_0^{-k}}{k}\right)^{3.0024}
\end{aligned}
$$

for

$((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to 1.0012)$

$\Gamma(x)$ is the gamma function

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

Integral representations:

$$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} = \frac{321.595\,e^8}{\log^{1.0012}(3)} + \frac{10.0498\,e^8\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}}{\log^{2.0012}(3)}\int_0^1 \log^{1.0012}\left(\frac{1}{t}\right)dt$$

- $$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} = \frac{10.0498\,e^8\left(32\left(\int_1^3 \frac{1}{t}\,dt\right)^{2.0012} + \int_0^1\int_0^1 \frac{\log^{1.0012}\left(\frac{1}{t_2}\right)}{1+t_1}\,dt_2\,dt_1\right)}{\left(\int_1^3 \frac{1}{t}\,dt\right)^{3.0024}}$$

- $$\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)} = \frac{321.595\,e^8}{\log^{1.0012}(3)} + \frac{10.0498\,e^8\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}}{\log^{2.0012}(3)}\int_1^\infty t^{1.0012}\,\mathcal{A}^{-t}\,dt + \frac{10.0498\,e^8\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(-1)^k}{(2.0012+k)k!}}{\log^{2.0012}(3)}$$

We note that:

((((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3)))))))))^1/32

Input interpretation:

$$\sqrt[32]{1.25623\times\frac{(2e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}$$

log(x) is the natural logarithm
n! is the factorial function

Result:

1.639766458168004084764132857631915703511047148480676779344...

1.639766458168…

And:

(29+3)/10^3+((((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3)))))))))))^1/32

where 29 and 3 are Lucas numbers

Input interpretation:

$$\frac{29+3}{10^3}+\sqrt[32]{1.25623\times\frac{(2\,e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}$$

log(x) is the natural logarithm
n! is the factorial function

Result:

1.671766458168004084764132857631915703511047148480676779344...

1.671766458…. result practically equal to the value of the formula:

$m_{p'} = 2\times\frac{\eta}{R}m_P = 1.6714213\times 10^{-24}$ gm

that is the holographic proton mass

Alternative representations:

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2\,e)^8}{\log^{1.0012}(3)}} = \frac{32}{10^3}+\sqrt[32]{\frac{1.25623\,(2\,e)^8\left(1+\frac{0.0012!!\times 1.0012!!\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}}{32\log(3)}\right)}{\log^{1.0012}(3)}}$$

-

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} = \frac{32}{10^3}+\sqrt[32]{\frac{1.25623\,(2e)^8\left(1+\frac{\log_e(2)\,(1)_{1.0012}\left(\frac{\log_e(3)}{\log_e(1.00289)}\right)^{1.0012}}{32\log_e(3)}\right)}{\log_e^{1.0012}(3)}}$$

-

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} = \frac{32}{10^3}+\sqrt[32]{\frac{1.25623\,(2e)^8\left(1+\frac{0.0012!!\times 1.0012!!\log_e(2)\left(\frac{\log_e(3)}{\log_e(1.00289)}\right)^{1.0012}}{32\log_e(3)}\right)}{\log_e^{1.0012}(3)}}$$

Series representations:

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} = 0.032 + 1.07477\sqrt[32]{\frac{e^8\left(32\log(3)+\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)}{\log^{2.0012}(3)}}$$

for $((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to 1.0012)$

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$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2\,e)^8}{\log^{1.0012}(3)}}=$$

$$\begin{aligned}
&0.598857\Bigg(0.0534351+1.79471\Bigg(\Bigg(e^8\Bigg(64\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\,\pi}\right\rfloor+32\log(x)-\\
&\quad 32\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}+2\,i\,\pi\left\lfloor\frac{\arg(2-x)}{2\,\pi}\right\rfloor\\
&\quad\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\Bigg)\Big/\\
&\quad\quad\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(1.00289-x)}{2\,\pi}\right\rfloor+\log(x)-\\
&\quad\quad\quad\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-x)^k\,x^{-k}}{k}\Bigg)\Bigg)^{1.0012}\\
&\quad\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\log(x)\\
&\quad\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\Bigg)\Big/\\
&\quad\quad\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(1.00289-x)}{2\,\pi}\right\rfloor+\log(x)-\\
&\quad\quad\quad\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-x)^k\,x^{-k}}{k}\Bigg)\Bigg)^{1.0012}\\
&\quad\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-\\
&\quad\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\Bigg)\Big/\\
&\quad\quad\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(1.00289-x)}{2\,\pi}\right\rfloor+\log(x)-\\
&\quad\quad\quad\sum_{k=1}^{\infty}\frac{(-1)^k\,(1.00289-x)^k\,x^{-k}}{k}\Bigg)\Bigg)^{1.0012}\\
&\quad\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\\
&\quad\quad\frac{(-1)^{k_1}\,(2-x)^{k_1}\,x^{-k_1}\,(1.0012-n_0)^{k_2}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\Bigg)\Bigg)\Big/\\
&\quad\Bigg(2\,i\,\pi\left\lfloor\frac{\arg(3-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(3-x)^k\,x^{-k}}{k}\Bigg)^{2.0012}\Bigg)\text{^}(1/32)\Bigg)
\end{aligned}$$

for $((n_0\notin\mathbb{Z}\text{ or }n_0\geq 0)\text{ and }x<0\text{ and }n_0\to 1.0012)$

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$

$$0.598857\left(0.0534351+1.79471\left(\left(e^8\left(64 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+32\log(z_0)-32\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}+2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{2}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor\left(\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\log(z_0)\left(\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-\left(\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}(1.0012-n_0)^{k_2}(2-z_0)^{k_1}z_0^{-k_1}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\right)\right)\Big/\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)^{2.0012}\right)\hat{}\,(1/32)\right)$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 1.0012)$

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =$$

$$0.598857\Bigg(0.0534351+1.79471$$

$$\Bigg(\Bigg(e^8\Bigg(32\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+32\log(z_0)+32\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log(z_0)-$$

$$32\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg/\Bigg(\log(z_0)+$$

$$\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\log(z_0)$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg/\Bigg(\log(z_0)+$$

$$\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor$$

$$\log(z_0)\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg/\Bigg(\log(z_0)+$$

$$\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-$$

$$\Bigg(\Bigg(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg/\Bigg(\log(z_0)+$$

$$\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}$$

$$\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}$$

$$\frac{(-1)^{k_1}(1.0012-n_0)^{k_2}(2-z_0)^{k_1}z_0^{-k_1}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\Bigg)\Bigg)$$

$$\Big/$$

$$\Bigg(\Bigg(\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log(z_0)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor$$

$$\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)^{1.0012}\Bigg)\Bigg)\hat{}$$

$$(1/32)\Bigg)\quad\text{for }((n_0\notin\mathbb{Z}\text{ or }n_0\geq 0)\text{ and }n_0\to 1.0012)$$

Integral representations:

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =$$
$$0.032+1.07477\sqrt[32]{\frac{e^8\left(32\log(3)+\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\int_0^1\log^{1.0012}\left(\frac{1}{t}\right)dt\right)}{\log^{2.0012}(3)}}$$

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =$$
$$1.07477\left(0.0297737+\sqrt[32]{\frac{e^8\left(32\int_1^3\frac{1}{t}\,dt+\int_0^1\int_0^1\frac{\log^{1.0012}\left(\frac{1}{t_2}\right)}{1+t_1}\,dt_2\,dt_1\right)}{\left(\int_1^3\frac{1}{t}\,dt\right)^{2.0012}}}\right)$$

•

$$\frac{29+3}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =$$
$$\frac{4}{125}+1.19771\sqrt[32]{\frac{e^8\left(1+\frac{\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\left(\int_1^\infty t^{1.0012}\,\mathcal{A}^{-t}\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(2.0012+k)k!}\right)}{32\log(3)}\right)}{\log^{1.0012}(3)}}$$

-21/10^3+((((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3))))))))))^1/32

Input interpretation:

$$-\frac{21}{10^3}+\sqrt[32]{1.25623\times\frac{(2e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}$$

Result:

1.618766458168004084764132857631915703511047148480676779344...

1.618766458168…. a very good approximation to the golden ratio 1.61803398...

Alternative representations:

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$
$$-\frac{21}{10^3}+\sqrt[32]{\frac{1.25623\,(2e)^8\left(1+\frac{0.0012!!\times 1.0012!!\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}}{32\log(3)}\right)}{\log^{1.0012}(3)}}$$

-

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$
$$-\frac{21}{10^3}+\sqrt[32]{\frac{1.25623\,(2e)^8\left(1+\frac{\log_e(2)(1)_{1.0012}\left(\frac{\log_e(3)}{\log_e(1.00289)}\right)^{1.0012}}{32\log_e(3)}\right)}{\log_e^{1.0012}(3)}}$$

-

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$
$$-\frac{21}{10^3}+\sqrt[32]{\frac{1.25623\,(2e)^8\left(1+\frac{0.0012!!\times 1.0012!!\log_e(2)\left(\frac{\log_e(3)}{\log_e(1.00289)}\right)^{1.0012}}{32\log_e(3)}\right)}{\log_e^{1.0012}(3)}}$$

-

Series representations:

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=-0.021+$$
$$1.07477\sqrt[32]{\frac{e^8\left(32\log(3)+\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)}{\log^{2.0012}(3)}}$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 1.0012)$

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$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =$$

$$0.598857\left(-0.0350668+1.79471\left(\left(e^8\left(64 i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+32\log(x)-32\sum_{k=1}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}}{k}+2i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\left(\left(2i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}}{k}\right)\Big/\left(2i\pi\left\lfloor\frac{\arg(1.00289-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-x)^k x^{-k}}{k}\right)\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\log(x)\left(\left(2i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}}{k}\right)\Big/\left(2i\pi\left\lfloor\frac{\arg(1.00289-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-x)^k x^{-k}}{k}\right)\right)^{1.0012}\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-\left(\left(2i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}}{k}\right)\Big/\left(2i\pi\left\lfloor\frac{\arg(1.00289-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-x)^k x^{-k}}{k}\right)\right)^{1.0012}\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}(2-x)^{k_1}x^{-k_1}(1.0012-n_0)^{k_2}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\right)\right)\Big/\left(2i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}}{k}\right)^{2.0012}\right)\hat{}\,(1/32)\right)$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $x < 0$ and $n_0 \to 1.0012)$

$$
-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =
$$

$$
\begin{aligned}
&0.598857\Bigg(-0.0350668+1.79471\\
&\Bigg(\Bigg(e^8\Bigg(64\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+32\log(z_0)-32\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}+\\
&2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{2}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\\
&\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Big/\\
&\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\\
&\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}\\
&\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\log(z_0)\\
&\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\\
&\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Big/\\
&\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\\
&\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}\\
&\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-\\
&\Bigg(\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\\
&\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)\Big/\\
&\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1.00289}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\\
&\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\Bigg)\Bigg)^{1.0012}\\
&\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\\
&\frac{(-1)^{k_1}(1.0012-n_0)^{k_2}(2-z_0)^{k_1}z_0^{-k_1}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\Bigg)\Bigg)\\
&\Big/\Bigg(2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{3}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\\
&\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\Bigg)^{2.0012}\Bigg)\wedge(1/32)\Bigg)
\end{aligned}
$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 1.0012)$

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}} =$$

$$0.598857\left(-0.0350668+1.79471\right.$$

$$\left(\left(e^8\left(32\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+32\log(z_0)+32\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log(z_0)-\right.\right.\right.$$

$$32\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)$$

$$\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\log(z_0)$$

$$\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}+\left\lfloor\frac{\arg(2-z_0)}{2\pi}\right\rfloor$$

$$\log(z_0)\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}$$

$$\sum_{k=0}^{\infty}\frac{(1.0012-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}-$$

$$\left(\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\Big/\left(\log(z_0)+\left\lfloor\frac{\arg(1.00289-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(1.00289-z_0)^k z_0^{-k}}{k}\right)\right)^{1.0012}$$

$$\left.\left.\sum_{k_1=1}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1}(1.0012-n_0)^{k_2}(2-z_0)^{k_1}z_0^{-k_1}\,\Gamma^{(k_2)}(1+n_0)}{k_2!\,k_1}\right)\right)$$

$$\Big/$$

$$\left(\left(\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(3-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)^{1.0012}\right)\right)\hat{}$$

$$\left.(1/32)\right)$$ for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 1.0012)$

$\Gamma(x)$ is the gamma function

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

Integral representations:

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$

$$-0.021+1.07477\sqrt[32]{\frac{e^8\left(32\log(3)+\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\int_0^1\log^{1.0012}\left(\frac{1}{t}\right)dt\right)}{\log^{2.0012}(3)}}$$

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$

$$1.07477\left(-0.019539+\sqrt[32]{\frac{e^8\left(32\int_1^3\frac{1}{t}\,dt+\int_0^1\int_0^1\frac{\log^{1.0012}\left(\frac{1}{t_2}\right)}{1+t_1}\,dt_2\,dt_1\right)}{\left(\int_1^3\frac{1}{t}\,dt\right)^{2.0012}}}\right)$$

$$-\frac{21}{10^3}+\sqrt[32]{\frac{\left(1.25623\left(1+\frac{1.0012!\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\log(2)}{32\log(3)}\right)\right)(2e)^8}{\log^{1.0012}(3)}}=$$

$$-\frac{21}{1000}+1.19771\sqrt[32]{\frac{e^8\left(1+\frac{\log(2)\left(\frac{\log(3)}{\log(1.00289)}\right)^{1.0012}\left(\int_1^\infty t^{1.0012}\,\mathcal{A}^{-t}\,dt+\sum_{k=0}^\infty\frac{(-1)^k}{(2.0012+k)k!}\right)}{32\log(3)}\right)}{\log^{1.0012}(3)}}$$

Now, we have that:

Lemma 7. *Let m be an integer with $1 \leqslant m < (\log x)/192$ and let $x^{1/(4m)} < y \leqslant x^{1/m}$. Then the following estimate holds:*

$$\int_T^{T+H} \left(S(t) + \frac{1}{\pi} \sum_{p<y} \frac{\sin(t \log p)}{\sqrt{p}} \right)^{2m} dt < (e^{37}\pi^{-2}\varepsilon^{-3}m^2)^m H.$$

H = $T^{27/82+\varepsilon}$; T = 2; z = 3, ν = 1.0012; m = 1 or 0.5; x = $T^{0.1\varepsilon}$ ε = 1/24 = 0,04166666;

x = 1.002893; H = 1,256230382233478, we obtain:

((((exp(37) * Pi^(-2) * (1/24)^(-3) * (0.5)^2))))^0.5 * 1.256230382233478

Input interpretation:

$$\sqrt{\frac{\exp(37) \times 0.5^2}{\pi^2 \left(\frac{1}{24}\right)^3}} \times 1.256230382233478$$

Result:

2.544803199538653744852723242171744708170538239536962O3... × 10^9

2.5448031995... * 10^9

From the ratio with the result of previous expression:

7.464899309129489580981619014543285253212498349285227 57... × 10^6

We obtain:

2.5448031995 × 10^9 / (((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3))))))))

Input interpretation:

$$\frac{2.5448031995 \times 10^9}{1.25623 \times \frac{(2\,e)^8}{\log^{1.0012}(3)} \left(1 + \frac{1.0012!}{32} \left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012} \times \frac{\log(2)}{\log(3)}\right)}$$

log(x) is the natural logarithm

n! is the factorial function

Result:

340.90254859670159709406029404196110627042728030613417275 83...

340.9025485967…

We note that 340 is the sum of two Lucas numbers: 18 + 322. Furthermore, we obtain:

(((((((2.5448031995 × 10^9 / (((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3))))))))))))))^1/12

Input interpretation:

$$\sqrt[12]{\frac{2.5448031995\times 10^9}{1.25623\times \frac{(2e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}}$$

$\log(x)$ is the natural logarithm

$n!$ is the factorial function

Result:

1.625745350631718082229037481258608740550471968797917955126...

1.6257453506....

47/10^3+(((((2.5448031995 × 10^9 / (((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3))))))))))))))^1/12

Where 47 is a Lucas number

Input interpretation:

$$\frac{47}{10^3}+\sqrt[12]{\frac{2.5448031995\times 10^9}{1.25623\times \frac{(2e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}}$$

$\log(x)$ is the natural logarithm

$n!$ is the factorial function

Result:

1.672745350631718082229037481258608740550471968797917955126...

1.67274535…. result practically equal to the value of proton mass

18/10^3+(((((2.5448031995 × 10^9 / (((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3))))))))))))))^1/12

Where 18 is a Lucas number

Input interpretation:

$$\frac{18}{10^3}+\sqrt[12]{\frac{2.5448031995\times 10^9}{1.25623\times \frac{(2e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}}$$

$\log(x)$ is the natural logarithm

$n!$ is the factorial function

Result:

1.643745350631718082229037481258608740550471968797917955126...

1.64374535… ≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934$ ...

-7/10^3+(((((2.5448031995 × 10^9 / (((((1.25623 * (((2*e)^8 / ((ln3)^1.0012))) * (((1+1.0012!/32*(ln3/ln1.002893)^1.0012*(ln2/ln3))))))))))))))^1/12

Where 7 is a Lucas number

Input interpretation:

$$-\frac{7}{10^3}+\sqrt[12]{\frac{2.5448031995\times 10^9}{1.25623\times\frac{(2\,e)^8}{\log^{1.0012}(3)}\left(1+\frac{1.0012!}{32}\left(\frac{\log(3)}{\log(1.002893)}\right)^{1.0012}\times\frac{\log(2)}{\log(3)}\right)}}$$

$\log(x)$ is the natural logarithm

$n!$ is the factorial function

Result:

1.618745350631718082229037481258608740550471968797917955126...

1.61874535…. This result is a very good approximation to the value of the golden ratio 1,618033988749...

We observe that, from the previous expression, we obtain also:

(((((((((exp(37) * Pi^(-2) * (1/24)^(-3) * (0.5)^2))))^0.5 * 1.256230382233478)))))^1/45

Where 45 = 47 – 2 with 47 and 2 that are Lucas numbers.

Input interpretation:

$$\sqrt[45]{\sqrt{\frac{\exp(37)\times 0.5^2}{\pi^2\left(\frac{1}{24}\right)^3}}\times 1.256230382233478}$$

Result:

1.618134203098387316230469884880777463237581599433778812 28...

1.6181342.... This result is a very good approximation to the value of the golden ratio 1,618033988749...

Returning to the estimate for $I(n)$ and using the Cauchy inequality, we see that

$$I(n) \leqslant (15\pi)^{2m} \int_T^{T+H} (\sigma_{z,t} - 0.5)^{2(1+n)m} z^{2m(\sigma_{z,t}-0.5)} \times \left(\int_0^{+\infty} z^{-v} \left| \sum_{p<z^3} \frac{\Lambda_z(p)(\log p)^n \log(zp)}{p^{0.5+v}} p^{it} \right| dv \right)^{2m} dt \leqslant (15\pi)^{2m} \sqrt{j_1}\sqrt{j_2},$$

$$j_1 \leqslant H \frac{(2e)^{8m}}{(\log z)^{\nu}} \left(1 + 60m^{1.5}\varepsilon^{-1} \left(\frac{2}{3e} \right)^{4m} \right) < (4\varepsilon)^{-1} \frac{(2e)^{8m}}{(\log z)^{\nu}} H.$$

j_2 does not exceed the product

$$(\log z)^{\nu} \cdot 13(72^2 m)^{2m} H.$$

Thence, for $H = T^{27/82+\varepsilon}$; $T = 2$; $z = 3$, $\nu = 1.0012$; $m = 1$ or 0.5; $x = T^{0.1\varepsilon}$ $\varepsilon = 1/24 = 0{,}04166666$; $x = 1.002893$; $H = 1{,}256230382233478$, we obtain:

4*(1/24)^-1 * ((((2*e)^8 / (ln3)^1.0012))) * 1.256230382233478

Input interpretation:

$$\frac{4 \times \frac{(2e)^8}{\log^{1.0012}(3)} \times 1.256230382233478}{\frac{1}{24}}$$

$\log(x)$ is the natural logarithm

Result:

$8.376119802632029664960828749464344047300011861258926 94\ldots \times 10^7$

$8.3761198026320\ldots*10^7$

-

Alternative representations:

$$\frac{4 (2e)^8 \, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{5.0249215289339120000 (2e)^8}{\frac{1}{24} \log_e^{1.0012}(3)}$$

-

$$\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\left(2\coth^{-1}(2)\right)^{1.0012}}$$

- $$\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\left(\log(a)\log_a(3)\right)^{1.0012}}$$

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

$\coth^{-1}(x)$ is the inverse hyperbolic cotangent function

- **Series representations:**

$$\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{30\,873.117873769955328\, e^8}{\left(\log(2) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}$$

- $$\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{30\,873.117873769955328\, e^8}{\left(2 i \pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-x)^k x^{-k}}{k}\right)^{1.0012}} \quad \text{for } x < 0$$

- $$\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{30\,873.117873769955328\, e^8}{\left(\log(z_0) + \left\lfloor \frac{\arg(3-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-z_0)^k z_0^{-k}}{k}\right)^{1.0012}}$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$\frac{4(2e)^8\ 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{30\,873.117873769955328\, e^8}{\left(\int_1^3 \frac{1}{t}\, dt\right)^{1.0012}}$$

- $$\frac{4(2e)^8\ 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}} = \frac{61\,797.6\, e^8}{\left(\frac{1}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{2^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds\right)^{1.0012}} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

$$(\log z)^{\nu} \cdot 13(72^2 m)^{2m} H.$$

((((ln3)^1.0012)) * (13(72^2))^2) * 1.256230382233478

Input interpretation:

$(\log^{1.0012}(3)\,(13\times 72^2)^2)\times 1.256230382233478$

$\log(x)$ is the natural logarithm

Result:

$6.26873... \times 10^9$

i.e.

$6.26872832830030487776064395727841779947810160638925081... \times 10^9$

6.2687283283003…*10^9

Alternative representations:

$$1.2562303822334780000 \log^{1.0012}(3)\,(13\times 72^2)^2 = 1.2562303822334780000 \log_e^{1.0012}(3)\,(13\times 72^2)^2$$

- $$1.2562303822334780000 \log^{1.0012}(3)\,(13\times 72^2)^2 = 1.2562303822334780000\,(\log(a)\log_a(3))^{1.0012}\,(13\times 72^2)^2$$

- $$1.2562303822334780000 \log^{1.0012}(3)\,(13\times 72^2)^2 = 1.2562303822334780000\,(2\coth^{-1}(2))^{1.0012}\,(13\times 72^2)^2$$

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

$\coth^{-1}(x)$ is the inverse hyperbolic cotangent function

Series representations:

$$1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2 = 5.7053984927494983995 \times 10^9 \left(\log(2) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}$$

- $$1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2 = 5.7053984927494983995 \times 10^9 \left(2 i \pi \left\lfloor \frac{\arg(3-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-x)^k x^{-k}}{k}\right)^{1.0012} \quad \text{for } x < 0$$

- $$1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2 = 5.7053984927494983995 \times 10^9 \left(\log(z_0) + \left\lfloor \frac{\arg(3-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (3-z_0)^k z_0^{-k}}{k}\right)^{1.0012}$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2 = 5.7053984927494983995 \times 10^9 \left(\int_1^3 \frac{1}{t} \, dt\right)^{1.0012}$$

$$1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2 = 2.85033 \times 10^9 \left(\frac{1}{i\pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{2^{-s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)} \, ds\right)^{1.0012} \quad \text{for } -1 < \gamma < 0$$

$\Gamma(x)$ is the gamma function

sqrt(((((4*(1/24)^-1 * ((((2*e)^8 / (ln3)^1.0012))) * 1.256230382233478)))))* sqrt((((((ln3)^1.0012)) * (13(72^2))^2) * 1.256230382233478)))

Input interpretation:

$$\sqrt{\frac{4\times\frac{(2e)^8}{\log^{1.0012}(3)}\times 1.256230382233478}{\frac{1}{24}}}\sqrt{(\log^{1.0012}(3)\,(13\times 72^2)^2)\times 1.256230382233478}$$

log(x) is the natural logarithm

Result:

- $7.246214148643177034208494134121971143265696817307092 67\ldots\times 10^8$

7.246214148643…*10[8]

-

Alternative representations:

$$\sqrt{\frac{4\,(2e)^8\;1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.2562303822334780000\log^{1.0012}(3)\,(13\times 72^2)^2} = \sqrt{1.2562303822334780000\log_e^{1.0012}(3)\,(13\times 72^2)^2}\sqrt{\frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\log_e^{1.0012}(3)}}$$

-

$$\sqrt{\frac{4\,(2e)^8\;1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.2562303822334780000\log^{1.0012}(3)\,(13\times 72^2)^2} = \sqrt{1.2562303822334780000\,(\log(a)\log_a(3))^{1.0012}\,(13\times 72^2)^2}\sqrt{\frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}(\log(a)\log_a(3))^{1.0012}}}$$

-

$$\sqrt{\frac{4(2e)^8\, 1.25623038223347800000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.25623038223347800000\log^{1.0012}(3)\left(13\times 72^2\right)^2} =$$

$$\sqrt{1.25623038223347800000\left(2\coth^{-1}(2)\right)^{1.0012}\left(13\times 72^2\right)^2}\sqrt{\frac{5.02492152893391200000\,(2e)^8}{\frac{1}{24}\left(2\coth^{-1}(2)\right)^{1.0012}}}$$

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

$\coth^{-1}(x)$ is the inverse hyperbolic cotangent function

Series representations:

$$\sqrt{\frac{4(2e)^8\, 1.25623038223347800000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.25623038223347800000\log^{1.0012}(3)\left(13\times 72^2\right)^2} =$$

$$\sqrt{\frac{30873.117873769955328\,e^8}{\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}}\sqrt{5.7053984927494983995\times 10^9\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}$$

•

$$\sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.2562303822334780000 \log^{1.0012}(3)\left(13\times 72^2\right)^2} = \sqrt{-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}}\sqrt{-1.0000000000000000000+5.7053984927494983995\times 10^9 \log^{1.0012}(3)}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\binom{\frac{1}{2}}{k_1}\binom{\frac{1}{2}}{k_2}\left(-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}\right)^{-k_1}\left(-1.0000000000000000000+5.7053984927494983995\times 10^9 \log^{1.0012}(3)\right)^{-k_2}$$

$$\sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.2562303822334780000 \log^{1.0012}(3)\left(13\times 72^2\right)^2} = \sqrt{-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}}\sqrt{-1.0000000000000000000+5.7053984927494983995\times 10^9 \log^{1.0012}(3)}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_1!\,k_2!}(-1)^{k_1+k_2}\left(-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}\right)^{-k_1}\left(-1.0000000000000000000+5.7053984927494983995\times 10^9 \log^{1.0012}(3)\right)^{-k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

(15Pi)^2 * sqrt(((((4*(1/24)^-1 * ((((2*e)^8 / (ln3)^1.0012))) * 1.256230382233478)))))* sqrt(((((((ln3)^1.0012)) * (13(72^2))^2) * 1.256230382233478)))

Input interpretation:

$$\frac{(15\pi)^2 \sqrt{\frac{4\times\frac{(2e)^8}{\log^{1.0012}(3)}\times 1.256230382233478}{\frac{1}{24}}}}{\sqrt{\left(\log^{1.0012}(3)\left(13\times 72^2\right)^2\right)\times 1.256230382233478}}$$

log(x) is the natural logarithm

Result:

$1.60914\ldots \times 10^{12}$

$1.6091385086854052982798296090138338157308526310267718\ldots \times 10^{12}$

$1.6091385086\ldots*10^{12}$

- **Alternative representations:**

$$\frac{(15\pi)^2 \sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}}{\sqrt{1.2562303822334780000\,\log^{1.0012}(3)\left(13\times 72^2\right)^2}} = \frac{(15\pi)^2}{\sqrt{1.2562303822334780000\,\log_e^{1.0012}(3)\left(13\times 72^2\right)^2}} \sqrt{\frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\,\log_e^{1.0012}(3)}}$$

-

$$\frac{(15\pi)^2 \sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}}{\sqrt{1.2562303822334780000\,\log^{1.0012}(3)\left(13\times 72^2\right)^2}} = \frac{(15\pi)^2}{\sqrt{1.2562303822334780000\,(\log(a)\log_a(3))^{1.0012}\left(13\times 72^2\right)^2}} \sqrt{\frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\,(\log(a)\log_a(3))^{1.0012}}}$$

-

$$(15\pi)^2 \sqrt{\frac{4(2e)^8\ 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}$$
$$\sqrt{1.2562303822334780000 \log^{1.0012}(3)\left(13\times 72^2\right)^2} =$$
$$(15\pi)^2 \sqrt{1.2562303822334780000\left(2\coth^{-1}(2)\right)^{1.0012}\left(13\times 72^2\right)^2}$$
$$\sqrt{\frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\left(2\coth^{-1}(2)\right)^{1.0012}}}$$

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

$\coth^{-1}(x)$ is the inverse hyperbolic cotangent function

Series representations:

$$(15\pi)^2 \sqrt{\frac{4(2e)^8\ 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}}$$
$$\sqrt{1.2562303822334780000 \log^{1.0012}(3)\left(13\times 72^2\right)^2} =$$
$$225\,\pi^2 \sqrt{\frac{30\,873.117873769955328\,e^8}{\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}}$$
$$\sqrt{5.7053984927494983995\times 10^9\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}$$

•

$$(15\pi)^2 \sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}} \sqrt{1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2} =$$

$$225\pi^2 \sqrt{-1 + \frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}} \sqrt{-1.0000000000000000000 + 5.7053984927494983995 \times 10^9 \log^{1.0012}(3)}$$

$$\sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \binom{\frac{1}{2}}{k_1} \binom{\frac{1}{2}}{k_2} \left(-1 + \frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}\right)^{-k_1} \left(-1.0000000000000000000 + 5.7053984927494983995 \times 10^9 \log^{1.0012}(3)\right)^{-k_2}$$

$$(15\pi)^2 \sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}} \sqrt{1.2562303822334780000 \log^{1.0012}(3) \left(13 \times 72^2\right)^2} =$$

$$225\pi^2 \sqrt{-1 + \frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}} \sqrt{-1.0000000000000000000 + 5.7053984927494983995 \times 10^9 \log^{1.0012}(3)}$$

$$\sum_{k_1=0}^{\infty} \sum_{k_2=0}^{\infty} \frac{1}{k_1!\, k_2!} (-1)^{k_1+k_2} \left(-1 + \frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}\right)^{-k_1} \left(-1.0000000000000000000 + 5.7053984927494983995 \times 10^9 \log^{1.0012}(3)\right)^{-k_2} \left(-\frac{1}{2}\right)_{k_1} \left(-\frac{1}{2}\right)_{k_2}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

The reciprocal of the result, is:

1 / [(15Pi)^2 * sqrt(((((4*(1/24)^-1 * ((((2*e)^8 / (ln3)^1.0012))) * 1.256230382233478)))))* sqrt((((((((ln3)^1.0012)) * (13(72^2))^2) * 1.256230382233478)))]

Input interpretation:

$$1\Bigg/\left((15\pi)^2\sqrt{\frac{4\times\frac{(2e)^8}{\log^{1.0012}(3)}\times 1.256230382233478}{\frac{1}{24}}}\sqrt{\left(\log^{1.0012}(3)\left(13\times 72^2\right)^2\right)\times 1.256230382233478}\right)$$

$\log(x)$ is the natural logarithm

Result:

- More digits

$6.21451... \times 10^{-13}$

-

Alternative representations:

$$1\Bigg/\left((15\pi)^2\sqrt{\frac{4\,(2e)^8\; 1.25623038223347800000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.25623038223347800000\,\log^{1.0012}(3)\left(13\times 72^2\right)^2}\right)=$$
$$1\Bigg/\left((15\pi)^2\sqrt{1.25623038223347800000\,\log_e^{1.0012}(3)\left(13\times 72^2\right)^2}\sqrt{\frac{5.02492152893391200000\,(2e)^8}{\frac{1}{24}\log_e^{1.0012}(3)}}\right)$$

-

$$1\Bigg/\left((15\pi)^2\sqrt{\frac{4\,(2e)^8\; 1.25623038223347800000}{\frac{\log^{1.0012}(3)}{24}}}\sqrt{1.25623038223347800000\,\log^{1.0012}(3)\left(13\times 72^2\right)^2}\right)=$$
$$1\Bigg/\left((15\pi)^2\sqrt{1.25623038223347800000\left(2\coth^{-1}(2)\right)^{1.0012}\left(13\times 72^2\right)^2}\sqrt{\frac{5.02492152893391200000\,(2e)^8}{\frac{1}{24}\left(2\coth^{-1}(2)\right)^{1.0012}}}\right)$$

-

$$1\Bigg/\left((15\pi)^2 \sqrt{\frac{4(2e)^8\ 1.25623038223347800000}{\frac{\log^{1.0012}(3)}{24}}} \sqrt{1.25623038223347800000 \log^{1.0012}(3)\left(13\times 72^2\right)^2}\right) =$$

$$1\Bigg/\left((15\pi)^2 \sqrt{1.25623038223347800000\,(\log(a)\log_a(3))^{1.0012}\left(13\times 72^2\right)^2} \sqrt{\frac{5.0249215289339120000\,(2e)^8}{\frac{1}{24}\,(\log(a)\log_a(3))^{1.0012}}}\right)$$

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

$\coth^{-1}(x)$ is the inverse hyperbolic cotangent function

Series representations:

$$1\Bigg/\left((15\pi)^2 \sqrt{\frac{4(2e)^8\ 1.25623038223347800000}{\frac{\log^{1.0012}(3)}{24}}} \sqrt{1.25623038223347800000 \log^{1.0012}(3)\left(13\times 72^2\right)^2}\right) =$$

$$1\Bigg/\left(225\pi^2 \sqrt{\frac{30\,873.117873769955328\,e^8}{\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}} \sqrt{5.7053984927494983995\times 10^9\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^{1.0012}}\right)$$

•

$$1\Bigg/\left((15\pi)^2 \sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}} \sqrt{1.2562303822334780000 \log^{1.0012}(3)\left(13\times 72^2\right)^2}\right) =$$

$$1\Bigg/\left(225\pi^2 \sqrt{-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}} \sqrt{-1.0000000000000000000 + 5.7053984927494983995\times 10^9 \log^{1.0012}(3)} \left(\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}\right)^{-k}\right) \sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}(-1.0000000000000000000 + 5.7053984927494983995\times 10^9 \log^{1.0012}(3))^{-k}\right)$$

- $$1\Bigg/\left((15\pi)^2 \sqrt{\frac{4(2e)^8\, 1.2562303822334780000}{\frac{\log^{1.0012}(3)}{24}}} \sqrt{1.2562303822334780000 \log^{1.0012}(3)\left(13\times 72^2\right)^2}\right) =$$

$$1\Bigg/\left(225\pi^2 \sqrt{-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}} \sqrt{-1.0000000000000000000 + 5.7053984927494983995\times 10^9 \log^{1.0012}(3)} \left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+\frac{30\,873.117873769955328\, e^8}{\log^{1.0012}(3)}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k(-1.0000000000000000000 + 5.7053984927494983995\times 10^9 \log^{1.0012}(3))^{-k}\left(-\frac{1}{2}\right)_k\right)$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

We have that:

Thence, for H = $T^{27/82+\varepsilon}$; T = 2; z = 3, ν = 1.0012; m = 1 or 0.5; x = $T^{0.1\varepsilon}$ ε = 1/24 = 0,04166666; x = 1.002893; H = 1,256230382233478, we obtain:

$$I_5 + I_6 < \frac{2H}{\sqrt{\varepsilon}}(e^{24}m)^{m}$$

(e^24) * (((2*1.256230382233478))) / (((sqrt(1/24))))

Input interpretation:

$$e^{24} \times \frac{2 \times 1.256230382233478}{\sqrt{\frac{1}{24}}}$$

Result:

$$3.260411940037072\ldots \times 10^{11}$$

3.2604119400…*10^{11}

Series representations:

$$\frac{e^{24}\,(2 \times 1.2562303822334780000)}{\sqrt{\frac{1}{24}}} = \frac{2.5124607644669560000\,e^{24}}{\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{23}{24}\right)^k \left(-\frac{1}{2}\right)_k}{k!}}$$

•

$$\frac{e^{24}\,(2 \times 1.2562303822334780000)}{\sqrt{\frac{1}{24}}} = -\frac{5.0249215289339120000\,e^{24}\sqrt{\pi}}{\sum_{j=0}^{\infty} \operatorname{Res}_{s=-j} \left(-\frac{23}{24}\right)^{-s} \Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}$$

$$\frac{e^{24}\,(2 \times 1.2562303822334780000)}{\sqrt{\frac{1}{24}}} = \frac{2.5124607644669560000\,e^{24}}{\sqrt{z_0}\,\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{1}{24}-z_0\right)^k z_0^{-k}}{k!}}$$

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

$n!$ is the factorial function

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

$\Gamma(x)$ is the gamma function

$\operatorname*{Res}_{z=z_0} f$ is a complex residue

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

Now, we have that:

$$I_7 \leqslant (15\pi)^{2m} \int_T^{T+H} (\sigma_{z,t} - 0.5)^{2m} \left| \sum_{p<z^3} \frac{\Lambda_z(p)}{\sqrt{p}} p^{it} \right|^{2m} dt \leqslant (15\pi)^{2m} \sqrt{j_3}\sqrt{j_4},$$

$$j_3 = \int_T^{T+H} (\sigma_{z,t} - 0.5)^{4m} \, dt,$$

$$j_4 = \int_T^{T+H} \left| \sum_{p<z^3} \frac{\Lambda_z(p)}{\sqrt{p}} p^{it} \right|^{4m} dt$$

$$= (\log z)^{4m} \int_0^H \left| \sum_{p<z^3} \frac{a(p)}{\sqrt{p}} p^{it} \right|^{4m} dt, \quad a(p) = \frac{\Lambda_z(p)}{\log z} p^{iT}.$$

Setting $\xi = 1$ and $\nu = 4m$ in Lemma 6, we obtain

$$j_3 \leqslant H \frac{(2e)^{8m}}{(\log z)^{4m}} (1 + 45m^{1.5}\varepsilon^{-1}(3e)^{-4m}) < (80\varepsilon)^{-1} H \frac{(2e)^{8m}}{(\log z)^{4m}} \, .$$

Since the absolute value of $a(p)$ does not exceed the fraction

$$\frac{3 \log p}{\log(z^3)}$$

for $p \leqslant z^3$, it follows from Lemma 3 applied to j_4 with $\varkappa = H$, $\xi = z^3$, and $B = 3$ that

$$j_4 \leqslant 13(2 \cdot 3^2 \cdot 2m)^{2m} H (\log z)^{4m}.$$

Passing to an estimate for I_7, we have

$$I_7 \leqslant (15\pi)^{2m} \frac{H}{\sqrt{\varepsilon}} (2e)^{4m} (36m)^m < \frac{H}{\sqrt{\varepsilon}} (e^{19} m)^m.$$

Thence, for H = $T^{27/82+\varepsilon}$; T = 2; z = 3, ν = 1.0012; m = 1 or 0.5; x = $T^{0.1\varepsilon}$ ε = 1/24 = 0,04166666; x = 1.002893; H = 1,256230382233478, we obtain:

(15Pi)^2* (((((sqrt(((80*1/24)^-1*1.25623038*((((2*e)^8/(ln3)^4)))))))))) *
(((((sqrt(((13(2*3^2*2)^2*1.25623038(ln3)^4))))))))

Input interpretation:

$$(15\pi)^2 \sqrt{\frac{1.25623038 \times \frac{(2e)^8}{\log^4(3)}}{80 \times \frac{1}{24}}} \sqrt{13 (2 \times 3^2 \times 2)^2 \times 1.25623038 \log^4(3)}$$

log(x) is the natural logarithm

Result:

$1.73254399\ldots \times 10^8$

$1.73254398860430049678048005183511593009420209130208425\ldots \times 10^8$

1.7325439886…*10^8

- **Alternative representations:**

$$(15\pi)^2 \sqrt{\frac{1.25623 (2e)^8}{\frac{80\log^4(3)}{24}}} \sqrt{13 (2 \times 3^2 \times 2)^2\, 1.25623 \log^4(3)} = (15\pi)^2 \sqrt{16.331 \times 36^2 \log_e^4(3)} \sqrt{\frac{1.25623 (2e)^8}{\frac{80}{24} \log_e^4(3)}}$$

- $$(15\pi)^2 \sqrt{\frac{1.25623 (2e)^8}{\frac{80\log^4(3)}{24}}} \sqrt{13 (2 \times 3^2 \times 2)^2\, 1.25623 \log^4(3)} = (15\pi)^2 \sqrt{16.331 \times 36^2 (\log(a) \log_a(3))^4} \sqrt{\frac{1.25623 (2e)^8}{\frac{80}{24} (\log(a) \log_a(3))^4}}$$

- $$(15\pi)^2 \sqrt{\frac{1.25623 (2e)^8}{\frac{80\log^4(3)}{24}}} \sqrt{13 (2 \times 3^2 \times 2)^2\, 1.25623 \log^4(3)} = (15\pi)^2 \sqrt{16.331 \times 36^2 (2 \coth^{-1}(2))^4} \sqrt{\frac{1.25623 (2e)^8}{\frac{80}{24} (2 \coth^{-1}(2))^4}}$$

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

$\coth^{-1}(x)$ is the inverse hyperbolic cotangent function

-

Series representations:

$$(15\,\pi)^2 \sqrt{\frac{1.25623\,(2\,e)^8}{\frac{80\log^4(3)}{24}}} \sqrt{13\,(2\times 3^2\times 2)^2\; 1.25623\log^4(3)} =$$

$$225\,\pi^2 \sqrt{-1+\frac{96.4785\,e^8}{\log^4(3)}} \sqrt{-1+21\,165.\log^4(3)} \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty} \binom{\frac{1}{2}}{k_1}\binom{\frac{1}{2}}{k_2}\left(-1+\frac{96.4785\,e^8}{\log^4(3)}\right)^{-k_1} \left(-1+21\,165.\log^4(3)\right)^{-k_2}$$

-

$$(15\,\pi)^2 \sqrt{\frac{1.25623\,(2\,e)^8}{\frac{80\log^4(3)}{24}}} \sqrt{13\,(2\times 3^2\times 2)^2\; 1.25623\log^4(3)} =$$

$$225\,\pi^2 \sqrt{\frac{96.4785\,e^8}{\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^4}} \sqrt{21\,165.\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)^4}$$

-

$$(15\,\pi)^2 \sqrt{\frac{1.25623\,(2\,e)^8}{\frac{80\log^4(3)}{24}}} \sqrt{13\,(2\times 3^2\times 2)^2\; 1.25623\log^4(3)} =$$

$$225\,\pi^2 \sqrt{-1+\frac{96.4785\,e^8}{\log^4(3)}} \sqrt{-1+21\,165.\log^4(3)} \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty} \frac{(-1)^{k_1+k_2}\left(-1+\frac{96.4785\,e^8}{\log^4(3)}\right)^{-k_1}\left(-1+21\,165.\log^4(3)\right)^{-k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}}{k_1!\,k_2!}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

We have also:

$$I_8 = \int_0^H \left| \sum_{p<z^{1.5}} \frac{a(p)}{p} p^{2it} \right|^{2m} dt \leqslant m^m H.$$

$$I_9 = \int_0^H \left| \sum_{p<z^3} \frac{a(p)}{\sqrt{p}} p^{it} \right|^{2m} dt \leqslant 13(2 \cdot 3^2 m)^m H < (e^{5.5} m)^m H.$$

$$\begin{aligned} I_{10} &\leqslant \int_T^{T+H} \left| \sum_{z^3<p<y} \frac{p^{it}}{\sqrt{p}} \right|^{2m} dt \\ &= \int_0^H \left| \sum_{p<y} \frac{a(p)}{\sqrt{p}} p^{it} \right|^{2m} dt \leqslant 13(2 \cdot 4^2 m)^m H < (e^{6.1} m)^m H. \end{aligned}$$

Thence, for $H = T^{27/82+\varepsilon}$; T = 2; z = 3, ν = 1.0012; m = 1 or 0.5; $x = T^{0.1\varepsilon}$ ε = 1/24 = 0,04166666; x = 1.002893; H = 1,256230382233478, we obtain:

1.256230382233478;

(e^5.5)*1.256230382233478

Input interpretation:

$e^{5.5} \times 1.256230382233478$

Result:

307.38943959772988580407164537709914595869063067603012665 48...

307.389439597...

(e^6.1)*1.256230382233478

Input interpretation:

$e^{6.1} \times 1.256230382233478$

Result:

560.100076932526397190275308981585126303116920150548467890 1...

560.1000769325...

From the sum of the results:

$1.6091385086\ldots*10^{12}$ $3.2604119400\ldots*10^{11}$ $1.7325439886\ldots*10^{8}$

1.256230382233478; 307.389439597... 560.1000769325...

We obtain:

(1.6091385086*10^12 +3.2604119400*10^11+1.7325439886*10^8 +1.256230382233478 +307.389439597 +560.1000769325)

Input interpretation:

$$1.6091385086\times10^{12}+3.2604119400\times10^{11}+1.7325439886\times10^{8}+1.256230382233478+307.389439597+560.1000769325$$

Result:

$$1.9353529578676057469117334 78\times10^{12}$$

Repeating decimal:

$$1.93535295786760574691173347 8\times10^{12}$$

$1.9353529578676\ldots*10^{12}$

And:

(1.6091385086*10^12 +3.2604119400*10^11+1.7325439886*10^8 +1.256230382233478 +307.389439597 +560.1000769325)^1/57

Input interpretation:

$$(1.6091385086\times10^{12}+3.2604119400\times10^{11}+1.7325439886\times10^{8}+1.256230382233478+307.389439597+560.1000769325)\,\hat{}\,(1/57)$$

Result:

1.64269598685...

1.64269598…. ≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934 \ldots$

29/10^3+(1.6091385086*10^12 +3.2604119400*10^11+1.7325439886*10^8 +1.256230382233478 +307.389439597 +560.1000769325)^1/57

Where 29 is a Lucas number

Input interpretation:

$$\frac{29}{10^3} + (1.6091385086 \times 10^{12} + 3.2604119400 \times 10^{11} + 1.7325439886 \times 10^8 + 1.256230382233478 + 307.389439597 + 560.1000769325) \wedge (1/57)$$

Result:

1.67169598685...

1.67169598…. result practically equal to the value of the formula:

$m_{p\prime} = 2 \times \frac{\eta}{R} m_P = 1.6714213 \times 10^{-24}$ gm

that is the holographic proton mass

-24/10^3+(1.6091385086*10^12 +3.2604119400*10^11+1.7325439886*10^8 +1.256230382233478 +307.389439597 +560.1000769325)^1/57

Input interpretation:

$$-\frac{24}{10^3} + (1.6091385086 \times 10^{12} + 3.2604119400 \times 10^{11} + 1.7325439886 \times 10^8 + 1.256230382233478 + 307.389439597 + 560.1000769325) \wedge (1/57)$$

Result:

1.61869598685...

1.618695986…. result that is a very good approximation to the value of the golden ratio 1,618033988749...

In conclusion, we have:

$$\pi^{2m} I < 7^{2m-1}\Big((e^{16.2}m)^{2m}\varepsilon^{-(2m+1)} + \frac{2}{\sqrt{\varepsilon}}(e^{24}m)^m$$
$$+ \frac{1}{\sqrt{\varepsilon}}(e^{19}m)^m + m^m H + (e^{5.5}m)^m + (e^{6.1}m)^m\Big)H$$
$$< (7e^{16.2}m)^{2m}\varepsilon^{-(2m+1)}H < (e^{37}\varepsilon^{-3}m^2)^m H.$$

(((exp(37)* (1/24)^-3))) * 1.256230382233478

Input interpretation:

$$\frac{\exp(37)}{\left(\frac{1}{24}\right)^3} \times 1.256230382233478$$

Result:

$2.035161359184528... \times 10^{20}$

$2.035161359...*10^{20}$

$1.9353529578676…*10^{12}$

We note that, from the ratio of the two results, we obtain also:

[((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1/0.6290748)^6))

Input interpretation:

$$\sqrt[\left(\frac{1}{0.6290748}\right)^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3} \times 1.256230382233478}{1.9353529578676 \times 10^{12}}}$$

Result:

3.141595303845995591603733311601075135919913410677183998480...

$3.1415953038459… \cong \pi$

From which we can to obtain C = 2πr = 6,2831906076919 that is a circle with radius equal to 1,00000843602750128912

2[((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1/0.6290748)^6))

Input interpretation:

$$2\sqrt[\left(\frac{1}{0.6290748}\right)^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3}\times 1.256230382233478}{1.9353529578676\times 10^{12}}}$$

Result:

6.283190607691991183207466623202150271839826821354367996961...

6.28319060769…

Input interpretation:

$$\frac{1}{2\pi}\times 2\sqrt[\left(\frac{1}{0.6290748}\right)^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3}\times 1.256230382233478}{1.9353529578676\times 10^{12}}}$$

Result:

1.000000843602750128913639254617090890505252772361143816622...

1.000000843602750...

We note that:

Input:

$\zeta(20.18)$

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

Result:

1.000000842047231832874744577386700923673234902125175719030...

1.00000084204723... a result vary near to the value of the circle radius above

And

1/6((((((([((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1/0.6290748)^6))))))))^2

Input interpretation:

$$\frac{1}{6}\left(\sqrt[\left(\frac{1}{0.6290748}\right)^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3}\times 1.256230382233478}{1.9353529578676\times 10^{12}}}\right)^2$$

Result:

1.644936842191202227266283026499016139064224075588841405359...

1.644936842.... ≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934$ ...

(29-2)/10^3+1/6((((((([((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1/0.6290748)^6))))))))^2

Input interpretation:

$$\frac{29-2}{10^3}+\frac{1}{6}\left(\sqrt[\left(\frac{1}{0.6290748}\right)^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3}\times 1.256230382233478}{1.9353529578676\times 10^{12}}}\right)^2$$

Result:

1.671936842191202227266283026499016139064224075588841405359...

1.6719368.... a result practically equal to the value of the formula:

$m_{p\prime} = 2\times\frac{\eta}{R}m_P = 1.6714213\times 10^{-24}$ gm

that is the holographic proton mass

-(29-2)/10^3+1/6((((((([((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1/0.6290748)^6))))))))^2

Input interpretation:

$$-\frac{29-2}{10^3}+\frac{1}{6}\left(\sqrt[\left(\frac{1}{0.6290748}\right)^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3}\times 1.256230382233478}{1.9353529578676\times 10^{12}}}\right)^2$$

Result:

1.617936842191202227266283026499016139064224075588841405359...

1.61793684219.... This result is a very good approximation to the value of the golden ratio 1,618033988749...

We have also that:

((((((([((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1.589506383)^6)))))))

Where 1.589506383 = 1,075226 + 2,103786766 = 3,179012766;

3,179012766 ÷ 2 = 1,589506383 where **2.103786766...** and 1.075226 are two results of Ramanujan mock theta functions!

Input interpretation:

$$\sqrt[1.589506383^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3} \times 1.256230382233478}{1.9353529578676 \times 10^{12}}}$$

Result:

3.14335682...

3.14335682....≅ π

2*((((((([((((((((exp(37)* (1/24)^-3))) * 1.256230382233478))))))/1.9353529578676*10^12]^1/(((1.589506383)^6)))))))

Input interpretation:

$$2\sqrt[1.589506383^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3} \times 1.256230382233478}{1.9353529578676 \times 10^{12}}}$$

Result:

6.2867136478926177030973556364347402732002720778172911979 42...

6.2867136478926... = 2πr with r = 1.000561552865...

Indeed:

Input interpretation:

$$\frac{1}{2\pi} \times 2\sqrt[1.589506383^6]{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3} \times 1.256230382233478}{1.9353529578676 \times 10^{12}}}$$

Result:

1.0005615528653913022131667564575858885412630036217251998 66...

1.00056155286539...

We note that:

Input:

$\zeta(10.82)$

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

Result:

1.000560383437973775703943629544312740741189100259521364546...

1.000560383437.... result very near to the value of the radius of above circle

From the above radius, computing the mass and the temperature, considering the brane a black hole, with the Ramanujan-Nardelli mock formula, we can to obtain the golden ratio:

sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(6.738462e+26)* sqrt[[-((((0.0001821192 * 4*Pi*(1.000562)^3-(1.000562)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times \frac{1}{6.738462\times 10^{26}}\sqrt{-\frac{0.0001821192\times 4\,\pi\times 1.000562^3-1.000562^2}{6.67\times 10^{-11}}}}}$$

Result:

1.618248882916651279772588461162778420462637620122863547662...

1.6182488829…

And the coniugate:

1/ sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(6.738462e+26)* sqrt[[-((((0.0001821192 * 4*Pi*(1.000562)^3-(1.000562)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\frac{1}{\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times \frac{1}{6.738462\times 10^{26}}\sqrt{-\frac{0.0001821192\times 4\,\pi\times 1.000562^3-1.000562^2}{6.67\times 10^{-11}}}}}}$$

Result:

0.617952...

0.617952...

We know that:

dual coordinate.[1–8] This is the Dirichlet condition: the X^{25} coordinate of the endpoint is fixed, so the endpoint is constrained to lie on a hyperplane.

In fact, all endpoints are constrained to lie on the same hyperplane. To see this, integrate

$$\begin{aligned} X'^{25}(\pi) - X'^{25}(0) &= \int_0^\pi d\sigma \partial_\sigma X'^{25} = i \int_0^\pi d\sigma \partial_\tau X^{25} \\ &= 2\pi\alpha' p^{25} = \frac{2\pi\alpha' n}{R} = 2\pi n R'. \end{aligned} \tag{31}$$

Thence, we have the following mathematical connections with the Dirichlet condition concerning the D-branes:

$$\int_0^\pi d\sigma \partial_\sigma X'^{25} = i \int_0^\pi d\sigma \partial_\tau X^{25} \quad = 2\pi\alpha' p^{25} = \frac{2\pi\alpha' n}{R} = 2\pi n R'.$$

$$2\left(\frac{1}{0.6290748}\right)^{6} \sqrt{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3} \times 1.256230382233478}{1.9353529578676 \times 10^{12}}}$$

6.283190607691991183207466623202150271839826821354367996961...

r = 1.000000843602750128913639254617090890505252772361143816622...

Or:

$$\int_0^\pi d\sigma \partial_\sigma X'^{25} = i \int_0^\pi d\sigma \partial_\tau X^{25} \quad = 2\pi\alpha' p^{25} = \frac{2\pi\alpha' n}{R} = 2\pi n R'.$$

$$2^{1.589506383^{6}}\sqrt{\frac{\frac{\exp(37)}{\left(\frac{1}{24}\right)^3}\times 1.256230382233478}{1.9353529578676\times 10^{12}}}$$

6.2867136478926177030973556364347402732002720778172911979 42...

r = 1.0005615528653913022131667564575858885412630036217251998 66...

From:

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Omega Theorems for Zeta Sums

A. A. Karatsuba

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Averaging (over t) the square of the modulus of S shows that the "bulk" of $|S|$ can be estimated from above slightly less accurately than the quadratic root of the number of summands. Indeed, if $T \geq T_1 > 0$, $2 \leq N \leq \sqrt{T}$ and the set $E \subset (T, 2T)$ is the set of the numbers t for which the inequality

$$\left|\sum_{n\leq N} n^{it}\right| \geq \sqrt{N}\,h(T), \qquad h(T) > 0,$$

holds, then we can easily find that

$$Nh^2(T)\mu(E) \leq \int_E \left|\sum_{n\leq N} n^{it}\right|^2 dt \leq \int_T^{2T} \left|\sum_{n\leq N} n^{it}\right|^2 dt \leq TN + 16N\log N \leq 17TN.$$

$$\operatorname{Re} s = \sigma \geq 1 - A\frac{(\log\log t)^\beta}{(\log t)^{1-\beta}}, \qquad t \geq 14,$$

where $A > 0$ is an absolute constant.

We can seek omega estimates of $|S(N)|$ of the form other than (7). Suppose that for $1 \leq N \leq t$ we have the estimate

$$|S(N)| \ll N\exp\left(-c\frac{\log^a N}{\log^b t}\right),$$

where $c > 0$ is a constant, $a > b > 0$, and $t \geq t_1 > 0$. For $a = 3$, $b = 2$ such an estimate was obtained by Vinogradov (see [8, 1]). Using the omega estimate of $|\zeta(1+it)|$ or the Dirichlet theorem, from the theory of Diophantine approximations we can easily prove that

$$\frac{a}{b} \ll \frac{\log\log t}{\log\log\log t}, \qquad t \to +\infty.$$

For N = 11 and T = 144, (11 is a Lucas number and 144 is a Fibonacci's number), from:

$$Nh^2(T)\mu(E) \leq \int_E \left|\sum_{n<N} n^{it}\right|^2 dt \leq \int_T^{2T} \left|\sum_{n<N} n^{it}\right|^2 dt \leq TN + 16N \log N \leq 17TN.$$

We obtain:

144*11 + 16*11 ln(11) <= 17*144*11

Input:

$144 \times 11 + 16 \times 11 \log(11) \leq 17 \times 144 \times 11$

log(x) is the natural logarithm

Difference:

$176 \log(11) - 25\,344$

-25344 + 176 log(11)

Input:

$-25\,344 + 176 \log(11)$

log(x) is the natural logarithm

Decimal approximation:

-24921.970431987486784245097930278137243231379593707014577 1...

-24921.97043198…

-

Property:

$-25\,344 + 176 \log(11)$ is a transcendental number

-

Alternate form:

$176 (\log(11) - 144)$

-

Alternative representations:

- More

$-25\,344 + 176 \log(11) = -25\,344 + 176 \log_e(11)$

-

$$-25\,344 + 176\log(11) = -25\,344 + 176\log(a)\log_a(11)$$

- $$-25\,344 + 176\log(11) = -25\,344 - 176\,\mathrm{Li}_1(-10)$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$-25\,344 + 176\log(11) = -25\,344 + 176\log(10) - 176\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}$$

- $$-25\,344 + 176\log(11) = -25\,344 + 352\,i\,\pi\left\lfloor\frac{\arg(11-x)}{2\,\pi}\right\rfloor + 176\log(x) - 176\sum_{k=1}^{\infty}\frac{(-1)^k\,(11-x)^k\,x^{-k}}{k} \quad \text{for } x<0$$

- $$-25\,344 + 176\log(11) = -25\,344 + 176\left\lfloor\frac{\arg(11-z_0)}{2\,\pi}\right\rfloor\log\left(\frac{1}{z_0}\right) + 176\log(z_0) + 176\left\lfloor\frac{\arg(11-z_0)}{2\,\pi}\right\rfloor\log(z_0) - 176\sum_{k=1}^{\infty}\frac{(-1)^k\,(11-z_0)^k\,z_0^{-k}}{k}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

- **Integral representations:**

$$-25\,344 + 176\log(11) = -25\,344 + 176\int_1^{11}\frac{1}{t}\,dt$$

- $$-25\,344 + 176\log(11) = -25\,344 - \frac{88\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

-((((-25344 + 176 log(11))))) / 15127

Where 15127 is a Lucas number

Input:

$$-\frac{-25\,344 + 176\log(11)}{15\,127}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{25\,344 - 176\log(11)}{15\,127}$$

Decimal approximation:

1.647515728960632431033588810093087673909656878013288462825...

1.64751572896….≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934$ ...

Property:

$\frac{25\,344 - 176\log(11)}{15\,127}$ is a transcendental number

- **Alternate forms:**

$$-\frac{176(\log(11) - 144)}{15\,127}$$

- $$\frac{25\,344}{15\,127} - \frac{176\log(11)}{15\,127}$$

- **Alternative representations:**

$$-\frac{-25\,344 + 176\log(11)}{15\,127} = \frac{25\,344 - 176\log_e(11)}{15\,127}$$

-

$$-\frac{-25\,344+176\log(11)}{15\,127}=\frac{25\,344-176\log(a)\log_a(11)}{15\,127}$$

- $$-\frac{-25\,344+176\log(11)}{15\,127}=\frac{25\,344+176\,\mathrm{Li}_1(-10)}{15\,127}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$-\frac{-25\,344+176\log(11)}{15\,127}=\frac{25\,344}{15\,127}-\frac{176\log(10)}{15\,127}+\frac{176\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}}{15\,127}$$

- $$-\frac{-25\,344+176\log(11)}{15\,127}=$$
$$\frac{25\,344}{15\,127}-\frac{352\,i\,\pi\left\lfloor\frac{\arg(11-x)}{2\pi}\right\rfloor}{15\,127}-\frac{176\log(x)}{15\,127}+\frac{176\sum_{k=1}^{\infty}\frac{(-1)^k(11-x)^k x^{-k}}{k}}{15\,127}\quad\text{for } x<0$$

- $$-\frac{-25\,344+176\log(11)}{15\,127}=\frac{25\,344}{15\,127}-\frac{176\left\lfloor\frac{\arg(11-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)}{15\,127}-$$
$$\frac{176\log(z_0)}{15\,127}-\frac{176\left\lfloor\frac{\arg(11-z_0)}{2\pi}\right\rfloor\log(z_0)}{15\,127}+\frac{176\sum_{k=1}^{\infty}\frac{(-1)^k(11-z_0)^k z_0^{-k}}{k}}{15\,127}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

- **Integral representations:**

$$-\frac{-25\,344+176\log(11)}{15\,127}=\frac{25\,344}{15\,127}-\frac{176}{15\,127}\int_1^{11}\frac{1}{t}\,dt$$

-

$$-\frac{-25\,344 + 176 \log(11)}{15\,127} = \frac{25\,344}{15\,127} + \frac{88\,i}{15\,127\pi} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds$$
for $-1 < \gamma < 0$

$\Gamma(x)$ is the gamma function

1/6 (((1/4 (-((((-25344 + 176 log(11))))))^1/4)))^2

Input:

$$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344 + 176 \log(11))}\right)^2$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{1}{96}\sqrt{25\,344 - 176 \log(11)}$$

Decimal approximation:

1.644447281340983986578801891727760223918055024106365671192...

1.64444728134…. ≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934$ ...

Property:

$\frac{1}{96}\sqrt{25\,344 - 176 \log(11)}$ is a transcendental number

- **Alternate forms:**

$$\frac{1}{24}\sqrt{1584 - 11 \log(11)}$$

- $$\frac{1}{24}\sqrt{11\,(144 - \log(11))}$$

- **Alternative representations:**

$$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2=\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{25\,344-176\log_e(11)}\right)^2$$

- $$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2=\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{25\,344-176\log(a)\log_a(11)}\right)^2$$

- $$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2=\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{25\,344+176\,\mathrm{Li}_1(-10)}\right)^2$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

Series representations:

$$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2=\frac{1}{96}\sqrt{25\,344-176\left(\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}\right)}$$

- $$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2=$$
$$\frac{1}{96}\sqrt{25\,344-176\left(2\,i\,\pi\left\lfloor\frac{\arg(11-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(11-x)^k\,x^{-k}}{k}\right)}\quad\text{for } x<0$$

- $$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2=\frac{1}{96}\sqrt{\left(25\,344-\right.}$$
$$\left.176\left(\log(z_0)+\left\lfloor\frac{\arg(11-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(11-z_0)^k\,z_0^{-k}}{k}\right)\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

- **Integral representations:**

$$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2 = \frac{1}{96}\sqrt{25\,344-176\int_1^{11}\frac{1}{t}\,dt}$$

•

$$\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2 =$$
$$\frac{1}{96}\sqrt{25\,344+\frac{88\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds} \quad \text{for } -1<\gamma<0$$

(29-2)/10^3+1/6 (((1/4 (-((((-25344 + 176 log(11))))))^1/4)))^2

Input:

$$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2$$

log(x) is the natural logarithm

Exact result:

$$\frac{27}{1000}+\frac{1}{96}\sqrt{25\,344-176\log(11)}$$

Decimal approximation:

1.671447281340983986578801891727760223918055024106365671192...

1.67144728…. result practically equal to the value of the formula:

$m_{p'} = 2\times\frac{\eta}{R}m_P = 1.6714213\times10^{-24}$ gm

that is the holographic proton mass

Property:

$\frac{27}{1000}+\frac{1}{96}\sqrt{25\,344-176\log(11)}$ is a transcendental number

•

Alternate forms:

$$\frac{27}{1000}+\frac{1}{24}\sqrt{1584-11\log(11)}$$

- $$\frac{27}{1000}+\frac{1}{24}\sqrt{11(144-\log(11))}$$

- $$\frac{81+125\sqrt{11(144-\log(11))}}{3000}$$

-
Alternative representations:

$$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25344+176\log(11))}\right)^2=\frac{27}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{25344-176\log_e(11)}\right)^2$$

- $$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25344+176\log(11))}\right)^2=$$
$$\frac{27}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{25344-176\log(a)\log_a(11)}\right)^2$$

- $$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25344+176\log(11))}\right)^2=\frac{27}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{25344+176\,\mathrm{Li}_1(-10)}\right)^2$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

-
Series representations:

$$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25344+176\log(11))}\right)^2=$$
$$\frac{27}{1000}+\frac{1}{96}\sqrt{25344-176\left(\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}\right)}$$

-

$$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2 = \frac{27}{1000}+\frac{1}{96}\sqrt{25\,344-176\left(2\,i\,\pi\left\lfloor\frac{\arg(11-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(11-x)^k\,x^{-k}}{k}\right)}$$

for $x < 0$

- $$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2 = \frac{27}{1000}+\frac{1}{96}\sqrt{\left(25\,344-176\left(\log(z_0)+\left\lfloor\frac{\arg(11-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(11-z_0)^k\,z_0^{-k}}{k}\right)\right)}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

- **Integral representations:**

$$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2 = \frac{27}{1000}+\frac{1}{96}\sqrt{25\,344-176\int_1^{11}\frac{1}{t}\,dt}$$

- $$\frac{29-2}{10^3}+\frac{1}{6}\left(\frac{1}{4}\sqrt[4]{-(-25\,344+176\log(11))}\right)^2 = \frac{27}{1000}+\frac{1}{96}\sqrt{25\,344+\frac{88\,i}{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{10^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}\quad \text{for } -1<\gamma<0$$

For N = 11, c = 5, a = 3, b = 2 and t = 14, we obtain from:

$$|S(N)| \ll N\,\exp\left(-c\frac{\log^a N}{\log^b t}\right),$$

we obtain:
11*exp(-5*((((ln^3(11))/((ln^2(14))))

Input:

$$11 \exp\left(-5 \times \frac{\log^3(11)}{\log^2(14)}\right)$$

$\log(x)$ is the natural logarithm

Exact result:

$$11 e^{-(5 \log^3(11))/\log^2(14)}$$

Decimal approximation:

0.000552830615211073109887405550616657560035243405929988337...

0.000552830615211…

Property:

$11 e^{-(5 \log^3(11))/\log^2(14)}$ is a transcendental number

- **Alternate form:**

$$11 e^{-(5 \log^3(11))/(\log(2)+\log(7))^2}$$

- **Alternative representations:**

$$11 \exp\left(-\frac{5 \log^3(11)}{\log^2(14)}\right) = 11 \exp\left(-\frac{5 \log_e^3(11)}{\log_e^2(14)}\right)$$

- $$11 \exp\left(-\frac{5 \log^3(11)}{\log^2(14)}\right) = 11 \exp\left(-\frac{5 (\log(a) \log_a(11))^3}{(\log(a) \log_a(14))^2}\right)$$

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

- **Series representations:**

$$11 \exp\left(-\frac{5 \log^3(11)}{\log^2(14)}\right) = 11 \exp\left(-\frac{5 \left(\log(10) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{10}\right)^k}{k}\right)^3}{\left(\log(13) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{13}\right)^k}{k}\right)^2}\right)$$

- $$11 \exp\left(-\frac{5 \log^3(11)}{\log^2(14)}\right) = 11 \exp\left(-\frac{5\left(2 i \pi \left\lfloor \frac{\arg(11-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-x)^k x^{-k}}{k}\right)^3}{\left(2 i \pi \left\lfloor \frac{\arg(14-x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (14-x)^k x^{-k}}{k}\right)^2}\right)$$
  for $x < 0$

- $$11 \exp\left(-\frac{5 \log^3(11)}{\log^2(14)}\right) =$$
  $$11 \exp\left(-\frac{5\left(\log(z_0) + \left\lfloor \frac{\arg(11-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (11-z_0)^k z_0^{-k}}{k}\right)^3}{\left(\log(z_0) + \left\lfloor \frac{\arg(14-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (14-z_0)^k z_0^{-k}}{k}\right)^2}\right)$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

-76+1/ (((((11*exp(-5*((((ln^3(11))/((ln^2(14))))))))))))

Where 76 is a Lucas number

Input:

$$-76 + \frac{1}{11 \exp\left(-5 \times \frac{\log^3(11)}{\log^2(14)}\right)}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{1}{11} e^{(5 \log^3(11))/\log^2(14)} - 76$$

Decimal approximation:

1732.872324515160386107279602340921200572579471630789252801...

1732.8723245…

Alternate forms:

$$\frac{1}{11}\left(e^{(5 \log^3(11))/\log^2(14)} - 836\right)$$

$$\frac{1}{11}\left(e^{(5 \log^3(11))/(\log(2)+\log(7))^2} - 836\right)$$

$$\frac{1}{11} e^{(5 \log^3(11))/(\log(2)+\log(7))^2} - 76$$

- **Alternative representations:**

$$-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}=-76+\frac{1}{11\exp\left(-\frac{5\log_e^3(11)}{\log_e^2(14)}\right)}$$

- $$-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}=-76+\frac{1}{11\exp\left(-\frac{5(\log(a)\log_a(11))^3}{(\log(a)\log_a(14))^2}\right)}$$

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

- **Series representations:**

$$-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}=\frac{1}{11}\left(-836+\exp\left(\frac{5\left(\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}\right)^3}{\left(\log(13)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{13}\right)^k}{k}\right)^2}\right)\right)$$

- $$-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}=$$
$$\frac{1}{11}\left(-836+\exp\left(\frac{5\left(2i\pi\left\lfloor\frac{\arg(11-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-x)^k x^{-k}}{k}\right)^3}{\left(2i\pi\left\lfloor\frac{\arg(14-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(14-x)^k x^{-k}}{k}\right)^2}\right)\right)\quad\text{for } x<0$$

- $$-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}=$$
$$\frac{1}{11}\left(-836+\exp\left(\frac{5\left(\log(z_0)+\left\lfloor\frac{\arg(11-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-z_0)^k z_0^{-k}}{k}\right)^3}{\left(\log(z_0)+\left\lfloor\frac{\arg(14-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(14-z_0)^k z_0^{-k}}{k}\right)^2}\right)\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

2sqrt[6((((((-76+1/ (((((11*exp(-5*((((ln^3(11))/((ln^2(14)))))))))))))))))^1/15]

Input:

$$2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-5\times\frac{\log^3(11)}{\log^2(14)}\right)}}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$2\sqrt{6}\sqrt[30]{\frac{1}{11}e^{\left(5\log^3(11)\right)/\log^2(14)}-76}$$

Decimal approximation:

6.281516521465835536716642965319628146647221544302618224701...

6.281516521465… = C = 2πr

Alternate forms:

$$2\sqrt{6}\sqrt[30]{\frac{1}{11}\left(e^{\left(5\log^3(11)\right)/\log^2(14)}-836\right)}$$

- $$2\sqrt{6}\sqrt[30]{\frac{1}{11}e^{\left(5\log^3(11)\right)/(\log(2)+\log(7))^2}-76}$$

-

Alternative representations:

$$2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}=2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log_e^3(11)}{\log_e^2(14)}\right)}}}$$

- $$2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}=2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5(\log(a)\log_a(11))^3}{(\log(a)\log_a(14))^2}\right)}}}$$

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

- **Series representations:**

$$2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}} = \frac{2\sqrt{6}\sqrt[30]{-836+\exp\left(\frac{5\left(\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}\right)^3}{\left(\log(13)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{13}\right)^k}{k}\right)^2}\right)}}{\sqrt[30]{11}}$$

-

$$2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}} = \frac{2\sqrt{6}\sqrt[30]{-836+\exp\left(\frac{5\left(2i\pi\left\lfloor\frac{\arg(11-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-x)^k x^{-k}}{k}\right)^3}{\left(2i\pi\left\lfloor\frac{\arg(14-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(14-x)^k x^{-k}}{k}\right)^2}\right)}}{\sqrt[30]{11}} \quad \text{for } x<0$$

-

$$2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}} = \frac{2\sqrt{6}\sqrt[30]{-836+\exp\left(\frac{5\left(\log(z_0)+\left\lfloor\frac{\arg(11-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-z_0)^k z_0^{-k}}{k}\right)^3}{\left(\log(z_0)+\left\lfloor\frac{\arg(14-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(14-z_0)^k z_0^{-k}}{k}\right)^2}\right)}}{\sqrt[30]{11}}$$

arg(z) is the complex argument

⌊x⌋ is the floor function

(2Pi)* 1/((((2sqrt[6((((((-76+1/ (((((11*exp(-5*((((ln^3(11))/((ln^2(14))))))))))))))))))^1/15]))))

Input:

$$(2\pi)\times\frac{1}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-5\times\frac{\log^3(11)}{\log^2(14)}\right)}}}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{\pi}{\sqrt{6}\sqrt[30]{\frac{1}{11}e^{(5\log^3(11))/\log^2(14)}-76}}$$

Decimal approximation:

1.000265666055012065376898475018531988133572536841624152905...

1.000265666055….. = r = radius of circumference

Alternate forms:

$$\frac{\pi\sqrt[30]{\frac{11}{e^{(5\log^3(11))/\log^2(14)}-836}}}{\sqrt{6}}$$

- $$\frac{\pi}{\sqrt{6}\sqrt[30]{\frac{1}{11}e^{(5\log^3(11))/(\log(2)+\log(7))^2}-76}}$$

- **Alternative representations:**

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}}=\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log_e^3(11)}{\log_e^2(14)}\right)}}}}$$

- $$\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}}=\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5(\log(a)\log_a(11))^3}{(\log(a)\log_a(14))^2}\right)}}}}$$

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

Series representations:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}} = \frac{\pi}{\sqrt{6}\sqrt[30]{-76+\frac{1}{11}\exp\left(\frac{5\left(\log(10)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{10}\right)^k}{k}\right)^3}{\left(\log(13)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{13}\right)^k}{k}\right)^2}\right)}}$$

- $$\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}} = \frac{\pi}{\sqrt{6}\sqrt[30]{-76+\frac{1}{11}\exp\left(\frac{5\left(2i\pi\left\lfloor\frac{\arg(11-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-x)^k x^{-k}}{k}\right)^3}{\left(2i\pi\left\lfloor\frac{\arg(14-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(14-x)^k x^{-k}}{k}\right)^2}\right)}} \quad \text{for } x<0$$

- $$\frac{2\pi}{2\sqrt{6\sqrt[15]{-76+\frac{1}{11\exp\left(-\frac{5\log^3(11)}{\log^2(14)}\right)}}}} = \frac{\pi}{\sqrt{6}\sqrt[30]{-76+\frac{1}{11}\exp\left(\frac{5\left(\log(z_0)+\left\lfloor\frac{\arg(11-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(11-z_0)^k z_0^{-k}}{k}\right)^3}{\left(\log(z_0)+\left\lfloor\frac{\arg(14-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(14-z_0)^k z_0^{-k}}{k}\right)^2}\right)}}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

We note that 1.000265666055….. is very near to the value of ζ(12). Indeed:

zeta (12)

Input:

$\zeta(12)$

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

Exact result:

$$\frac{691\,\pi^{12}}{638512875}$$

Decimal approximation:

1.000246086553308048298637998047739670960416088458003404533...

1.0002460865533…

Property:

$\frac{691\,\pi^{12}}{638512875}$ is a transcendental number

-

Alternative representations:

$\zeta(12) = \zeta(12,\, 1)$

-

$\zeta(12) = S_{11,1}(1)$

-

$$\zeta(12) = \frac{\psi^{(11)}(1)\,(-1)^{12}}{11!}$$

$\zeta(s,\, a)$ is the generalized Riemann zeta function

$S_{n,p}(x)$ is the Nielsen generalized polylogarithm function

$\psi^{(n)}(x)$ is the n^{th} derivative of the digamma function

$n!$ is the factorial function

-

Integral representations:

$$\zeta(12) = \frac{2830336\left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^{12}}{638512875}$$

-

$$\zeta(12) = \frac{2830336 \left(\int_0^1 \frac{1}{\sqrt{1-t^2}}\, dt\right)^{12}}{638512875}$$

- $$\zeta(12) = \frac{11593056256 \left(\int_0^1 \sqrt{1-t^2}\, dt\right)^{12}}{638512875}$$

Thence, we have the following mathematical connection with the Dirichlet condition concerning the D-branes:

$$\int_0^\pi d\sigma \partial_\sigma X'^{25} = i \int_0^\pi d\sigma \partial_\tau X^{25} \quad = 2\pi\alpha' p^{25} = \frac{2\pi\alpha' n}{R} = 2\pi n R'.$$

$$2 \sqrt{6 \sqrt[15]{-76 + \frac{1}{11 \exp\left(-5 \times \frac{\log^3(11)}{\log^2(14)}\right)}}} \qquad 2\sqrt{6} \sqrt[30]{\frac{1}{11} e^{(5 \log^3(11))/\log^2(14)} - 76}$$

6.281516521465835536716642965319628146647221544302618224701... $= 2\pi r$

$$\frac{\pi}{\sqrt{6} \sqrt[30]{\frac{1}{11} e^{(5 \log^3(11))/\log^2(14)} - 76}}$$

1.000265666055012065376898475018531988133572536841624152905... $= r$

Now, we insert this radius in the Hawking Radiation calculator and obtain temperature and mass of this quantum black hole (a black brane).

Mass = 6.736469e+26

Radius = 1.000266

Temperature = 0.0001821731

From the Ramanujan-Nardelli mock formula, we obtain:

sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(6.736469e+26)* sqrt[[-((((0.0001821731 * 4*Pi*(1.000266)^3-(1.000266)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times \frac{1}{6.736469\times 10^{26}}\sqrt{-\frac{0.0001821731\times 4\,\pi\times 1.000266^3-1.000266^2}{6.67\times 10^{-11}}}}}$$

Result:

1.618248938735178025577670247874304978307846795256872628616...

1.618248938…

And the conjugate

1 / sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(6.736469e+26)* sqrt[[-((((0.0001821731 * 4*Pi*(1.000266)^3-(1.000266)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\frac{1}{\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times \frac{1}{6.736469\times 10^{26}}\sqrt{-\frac{0.0001821731\times 4\,\pi\times 1.000266^3-1.000266^2}{6.67\times 10^{-11}}}}}}$$

Result:

0.617951896067115073952485206270777030337420984711450298039...

0.617951896...

Now, we have that:

was obtained by Vinogradov (see [8, 1]). Using the omega estimate of $|\zeta(1+it)|$ or the Dirichlet theorem, from the theory of Diophantine approximations we can easily prove that

$$\frac{a}{b} \ll \frac{\log\log t}{\log\log\log t}, \qquad t \to +\infty.$$

We obtain, for t = 14:

ln(ln14) / ln(ln(ln(14)))

Input:

$$\frac{\log(\log(14))}{\log(\log(\log(14)))}$$

$\log(x)$ is the natural logarithm

Decimal approximation:

−32.3210231338405437985817608079562125106041355188346290265...

-32.32102313384…

Alternate form:

$$\frac{\log(\log(2)+\log(7))}{\log(\log(\log(2)+\log(7)))}$$

Alternative representations:

$$\frac{\log(\log(14))}{\log(\log(\log(14)))}=\frac{\log_e(\log(14))}{\log_e(\log(\log(14)))}$$

- $$\frac{\log(\log(14))}{\log(\log(\log(14)))}=\frac{\log(a)\log_a(\log(14))}{\log(a)\log_a(\log(\log(14)))}$$

- $$\frac{\log(\log(14))}{\log(\log(\log(14)))}=\frac{-\text{Li}_1(1-\log(14))}{-\text{Li}_1(1-\log(\log(14)))}$$

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

$\text{Li}_n(x)$ is the polylogarithm function

-

Series representations:

$$\frac{\log(\log(14))}{\log(\log(\log(14)))}=\frac{2\pi\left\lfloor\frac{\arg(-x+\log(14))}{2\pi}\right\rfloor-i\log(x)+i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(14))^k}{k}}{2\pi\left\lfloor\frac{\arg(-x+\log(\log(14)))}{2\pi}\right\rfloor-i\log(x)+i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(14)))^k}{k}}$$

for $x<0$

- $$\frac{\log(\log(14))}{\log(\log(\log(14)))} = \frac{2\pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor - i \log(z_0) + i \sum_{k=1}^{\infty} \frac{(-1)^k (\log(14) - z_0)^k z_0^{-k}}{k}}{2\pi \left\lfloor \frac{\pi - \arg\left(\frac{1}{z_0}\right) - \arg(z_0)}{2\pi} \right\rfloor - i \log(z_0) + i \sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(14)) - z_0)^k z_0^{-k}}{k}}$$

- $$\frac{\log(\log(14))}{\log(\log(\log(14)))} = \left(\left\lfloor \frac{\arg(\log(14) - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(\log(14) - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(14) - z_0)^k z_0^{-k}}{k} \right) / \left(\left\lfloor \frac{\arg(\log(\log(14)) - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(\log(\log(14)) - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(14)) - z_0)^k z_0^{-k}}{k} \right)$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

Integral representation:

$$\frac{\log(\log(14))}{\log(\log(\log(14)))} = \frac{\int_1^{\log(14)} \frac{1}{t}\, dt}{\int_1^{\log(\log(14))} \frac{1}{t}\, dt}$$

And for t = 18, where 18 is a Lucas number, we obtain:

ln(ln18) / ln(ln(ln(18)))

Input:

$$\frac{\log(\log(18))}{\log(\log(\log(18)))}$$

$\log(x)$ is the natural logarithm

Decimal approximation:

17.81601385916840590783241471903272500240518751073911212258...

17.81601385916….

Alternate form:

$$\frac{\log(\log(2) + 2\log(3))}{\log(\log(\log(2) + 2\log(3)))}$$

-

Alternative representations:

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{\log_e(\log(18))}{\log_e(\log(\log(18)))}$$

-

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{\log(a)\log_a(\log(18))}{\log(a)\log_a(\log(\log(18)))}$$

-

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{-\mathrm{Li}_1(1-\log(18))}{-\mathrm{Li}_1(1-\log(\log(18)))}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

-

Series representations:

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{2\pi\left\lfloor\frac{\arg(-x+\log(18))}{2\pi}\right\rfloor - i\log(x) + i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(18))^k}{k}}{2\pi\left\lfloor\frac{\arg(-x+\log(\log(18)))}{2\pi}\right\rfloor - i\log(x) + i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(18)))^k}{k}}$$
for $x < 0$

-

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}}{2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}}$$

- $$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \left(\left\lfloor \frac{\arg(\log(18) - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(\log(18) - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(18) - z_0)^k z_0^{-k}}{k}\right) / \left(\left\lfloor \frac{\arg(\log(\log(18)) - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(\log(\log(18)) - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(18)) - z_0)^k z_0^{-k}}{k}\right)$$

arg(z) is the complex argument

$\lfloor x \rfloor$ is the floor function

Integral representations:

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{\int_1^{\log(18)} \frac{1}{t}\, dt}{\int_1^{\log(\log(18))} \frac{1}{t}\, dt}$$

$$\frac{\log(\log(18))}{\log(\log(\log(18)))} = \frac{\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\, \Gamma(1+s)\, (-1+\log(18))^{-s}}{\Gamma(1-s)}\, ds}{\int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{\Gamma(-s)^2\, \Gamma(1+s)\, (-1+\log(\log(18)))^{-s}}{\Gamma(1-s)}\, ds} \quad \text{for } -1 < \gamma < 0$$

$\Gamma(x)$ is the gamma function

We have that:

-3/ [(((ln(ln14) / ln(ln(ln(14)))))) *1/(((ln(ln18) / ln(ln(ln(18))))))]

Input:

$$-\frac{3}{\frac{\log(\log(14))}{\log(\log(\log(14)))} \times \frac{1}{\frac{\log(\log(18))}{\log(\log(\log(18)))}}}$$

log(x) is the natural logarithm

Exact result:

$$-\frac{3\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}$$

Decimal approximation:

1.6536618087917026009934597398069212004862840371403201969 41...

1.65366180879…. is very near to the 14th root of the following Ramanujan's class invariant $Q = \left(G_{505}/G_{101/5}\right)^3$ = 1164,2696 i.e. 1,65578...

Alternate forms:

$$-\frac{3\log(\log(2)+2\log(3))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(2)+2\log(3)))}$$

$$-\frac{3\log(\log(2)+2\log(3))\log(\log(\log(2)+\log(7)))}{\log(\log(2)+\log(7))\log(\log(\log(2)+2\log(3)))}$$

- **Alternative representations:**

$$-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}} = -\frac{3}{\frac{\log_e(\log(14))}{\frac{\log_e(\log(\log(14)))\log_e(\log(18))}{\log_e(\log(\log(18)))}}}$$

- $$-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}} = -\frac{3}{\frac{\log(a)\log_a(\log(14))}{\frac{(\log(a)\log_a(\log(\log(14))))(\log(a)\log_a(\log(18)))}{\log(a)\log_a(\log(\log(18)))}}}$$

- $$-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}} = \frac{-3}{\frac{-\text{Li}_1(1-\log(14))}{\frac{-\text{Li}_1(1-\log(\log(14)))(-\text{Li}_1(1-\log(18)))}{-\text{Li}_1(1-\log(\log(18)))}}}$$

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

$\text{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} =$$

$$-\left(\left(3\left(2\pi\left\lfloor\frac{\arg(-x+\log(18))}{2\pi}\right\rfloor - i\log(x) + i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(18))^k}{k}\right)\right.\right.$$
$$\left(2\pi\left\lfloor\frac{\arg(-x+\log(\log(14)))}{2\pi}\right\rfloor - i\log(x) +\right.$$
$$\left.\left. i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(14)))^k}{k}\right)\right)\Big/$$
$$\left(\left(2\pi\left\lfloor\frac{\arg(-x+\log(14))}{2\pi}\right\rfloor - i\log(x) + i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(14))^k}{k}\right)\right.$$
$$\left(2\pi\left\lfloor\frac{\arg(-x+\log(\log(18)))}{2\pi}\right\rfloor - i\log(x) +\right.$$
$$\left.\left.\left. i\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(18)))^k}{k}\right)\right)\right) \quad \text{for } x < 0$$

$$-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} =$$

$$-\left(\left(3\left(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\right.\right.$$
$$\left(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) +\right.$$
$$\left.\left. i\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right)\Big/$$
$$\left(\left(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\right.$$
$$\left.\left.\left(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)\right)$$

$$-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} =$$

$$-\left(\left(3\left(\left\lfloor\frac{\arg(\log(18)-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(\log(18)-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\left(\left\lfloor\frac{\arg(\log(\log(14))-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(\log(\log(14))-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right)\Big/\left(\left(\left\lfloor\frac{\arg(\log(14)-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(\log(14)-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\left(\left\lfloor\frac{\arg(\log(\log(18))-z_0)}{2\pi}\right\rfloor\log\left(\frac{1}{z_0}\right)+\log(z_0)+\left\lfloor\frac{\arg(\log(\log(18))-z_0)}{2\pi}\right\rfloor\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

Integral representation:

$$-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} = \int_0^1\int_0^1 \frac{1}{(1+(-1+\log(18))t_1)(1+(-1+\log(\log(14)))t_2)}\,dt_2\,dt_1$$

-8/10^3+-3/ [(((ln(ln14) / ln(ln(ln(14)))))) *1/(((ln(ln18) / ln(ln(ln(18))))))]

Input:

$$-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\log(\log(\log(14)))}\times\frac{1}{\frac{\log(\log(18))}{\log(\log(\log(18)))}}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$-\frac{1}{125} - \frac{3 \log(\log(18)) \log(\log(\log(14)))}{\log(\log(14)) \log(\log(\log(18)))}$$

Decimal approximation:

1.645661808791702600993459739806921200486284037140320196941...

$$1.64566180879\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934 \ldots$$

Alternate forms:

$$-\frac{1}{125} - \frac{3 \log(\log(2) + 2 \log(3)) \log(\log(\log(14)))}{\log(\log(14)) \log(\log(\log(2) + 2 \log(3)))}$$

$$-\frac{375 \log(\log(18)) \log(\log(\log(14))) + \log(\log(14)) \log(\log(\log(18)))}{125 \log(\log(14)) \log(\log(\log(18)))}$$

-

$$-((\log(\log(2) + \log(7)) \log(\log(\log(2) + 2 \log(3))) + 375 \log(\log(2) + 2 \log(3)) \log(\log(\log(2) + \log(7)))) / (125 \log(\log(2) + \log(7)) \log(\log(\log(2) + 2 \log(3)))))$$

-

Alternative representations:

$$-\frac{8}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18)) \log(\log(\log(14)))}{\log(\log(\log(18)))}}} = -\frac{8}{10^3} - \frac{3}{\frac{\log_e(\log(14))}{\frac{\log_e(\log(\log(14))) \log_e(\log(18))}{\log_e(\log(\log(18)))}}}$$

-

$$-\frac{8}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18)) \log(\log(\log(14)))}{\log(\log(\log(18)))}}} = -\frac{8}{10^3} - \frac{3}{\frac{\log(a) \log_a(\log(14))}{\frac{(\log(a) \log_a(\log(\log(14)))) (\log(a) \log_a(\log(18)))}{\log(a) \log_a(\log(\log(18)))}}}$$

-

$$-\frac{8}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18)) \log(\log(\log(14)))}{\log(\log(\log(18)))}}} = -\frac{8}{10^3} - -\frac{3}{-\frac{\mathrm{Li}_1(1-\log(14))}{-\frac{\mathrm{Li}_1(1-\log(\log(14))) (-\mathrm{Li}_1(1-\log(18)))}{\mathrm{Li}_1(1-\log(\log(18)))}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

-
Series representations:

$$-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}}=$$
$$-\frac{1}{125}-\left(3\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(18))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(18))^k}{k}\right)\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(\log(14)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(14)))^k}{k}\right)\right)\Big/\left(\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(14))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(14))^k}{k}\right)\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(\log(18)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(18)))^k}{k}\right)\right)$$

for $x<0$

$$-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}}=-\frac{1}{125}-$$
$$\left(3\left(\log(z_0)+\left\lfloor\frac{\arg(\log(18)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(\log(\log(14))-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right)\Big/\left(\left(\log(z_0)+\left\lfloor\frac{\arg(\log(14)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(\log(\log(18))-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)$$

$$-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}}=$$

$$-\Bigg(\Bigg(1504\,\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor^2-1504\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\log(z_0)-$$

$$376\log^2(z_0)+2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}+$$

$$\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}+750\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(18)-z_0)^k\,z_0^{-k}}{k}+375\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(18)-z_0)^k\,z_0^{-k}}{k}+$$

$$750\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(14))-z_0)^k\,z_0^{-k}}{k}+$$

$$375\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(14))-z_0)^k\,z_0^{-k}}{k}+$$

$$2\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}+$$

$$\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}-$$

$$375\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,(\log(18)-z_0)^{k_1}\,(\log(\log(14))-z_0)^{k_2}\,z_0^{-k_1-k_2}}{k_1\,k_2}-$$

$$\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,(\log(14)-z_0)^{k_1}\,(\log(\log(18))-z_0)^{k_2}\,z_0^{-k_1-k_2}}{k_1\,k_2}\Bigg)\Bigg/$$

$$\Bigg(125\left(2\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-i\log(z_0)+i\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}\right)$$

$$\left(2\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-i\log(z_0)+i\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}\right)\Bigg)\Bigg)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

Integral representation:

$$-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}}=$$

$$-\left(\left(\int_0^1\int_0^1\frac{1}{(1+(-1+\log(18))\,t_1)\,(1+(-1+\log(\log(14)))\,t_2)}\,dt_2\,dt_1+\int_0^1\int_0^1\frac{1}{(1+(-1+\log(14))\,t_1)\,(1+(-1+\log(\log(18)))\,t_2)}\,dt_2\,dt_1\right)\Big/\left(125\left(\int_1^{\log(14)}\frac{1}{t}\,dt\right)\int_1^{\log(\log(18))}\frac{1}{t}\,dt\right)\right)$$

18/10^3+-3/ [(((ln(ln14) / ln(ln(ln(14)))))) *1/(((ln(ln18) / ln(ln(ln(18))))))]

Where 18 is a Lucas number

Input:

$$\frac{18}{10^3}-\frac{3}{\frac{\log(\log(14))}{\log(\log(\log(14)))}\times\frac{1}{\frac{\log(\log(18))}{\log(\log(\log(18)))}}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{9}{500}-\frac{3\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}$$

Decimal approximation:

1.671661808791702600993459739806921200486284037140320196941...

1.6716618087917…. a result practically equal to the value of the formula:

$m_{p'} = 2\times\frac{\eta}{R}m_P = 1.6714213\times10^{-24}$ gm

that is the holographic proton mass

Alternate forms:

- $$\frac{9}{500}-\frac{3\log(\log(2)+2\log(3))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(2)+2\log(3)))}$$

$$\frac{3\,(3\log(\log(14))\log(\log(\log(18))) - 500\log(\log(18))\log(\log(\log(14))))}{500\log(\log(14))\log(\log(\log(18)))}$$

- $$-((3\,(500\log(\log(2)+2\log(3))\log(\log(\log(2)+\log(7))) - 3\log(\log(2)+\log(7))\log(\log(\log(2)+2\log(3)))))\,/\,(500\log(\log(2)+\log(7))\log(\log(\log(2)+2\log(3)))))$$

- **Alternative representations:**

$$\frac{18}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}} = \frac{18}{10^3} - \frac{3}{\frac{\log_e(\log(14))}{\frac{\log_e(\log(\log(14)))\log_e(\log(18))}{\log_e(\log(\log(18)))}}}$$

- $$\frac{18}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}} = \frac{18}{10^3} - \frac{3}{\frac{\log(a)\log_a(\log(14))}{\frac{(\log(a)\log_a(\log(\log(14))))(\log(a)\log_a(\log(18)))}{\log(a)\log_a(\log(\log(18)))}}}$$

- $$\frac{18}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}} = \frac{18}{10^3} - -\frac{3}{-\frac{\mathrm{Li}_1(1-\log(14))}{-\frac{\mathrm{Li}_1(1-\log(\log(14)))(-\mathrm{Li}_1(1-\log(18)))}{\mathrm{Li}_1(1-\log(\log(18)))}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{18}{10^3} - \frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} =$$

$$\frac{9}{500} - \left(3\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(18))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(18))^k}{k}\right) \left(2 i \pi \left\lfloor \frac{\arg(-x+\log(\log(14)))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(\log(14)))^k}{k}\right)\right) / \left(\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(14))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(14))^k}{k}\right) \left(2 i \pi \left\lfloor \frac{\arg(-x+\log(\log(18)))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(\log(18)))^k}{k}\right)\right)$$

for $x < 0$

$$\frac{18}{10^3} - \frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} = \frac{9}{500} - \left(3\left(\log(z_0) + \left\lfloor \frac{\arg(\log(18)-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(18)-z_0)^k z_0^{-k}}{k}\right) \left(\log(z_0) + \left\lfloor \frac{\arg(\log(\log(14))-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right) / \left(\left(\log(z_0) + \left\lfloor \frac{\arg(\log(14)-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(14)-z_0)^k z_0^{-k}}{k}\right) \left(\log(z_0) + \left\lfloor \frac{\arg(\log(\log(18))-z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)$$

$$\frac{18}{10^3} - \frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} =$$

$$-\Bigg(\Bigg(3\Bigg(1988\,\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor^2 - 1988\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor\log(z_0) -$$

$$497\log^2(z_0) - 6\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k} - 3\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k} +$$

$$1000\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(18)-z_0)^k\,z_0^{-k}}{k} +$$

$$500\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(18)-z_0)^k\,z_0^{-k}}{k} +$$

$$1000\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(14))-z_0)^k\,z_0^{-k}}{k} +$$

$$500\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(14))-z_0)^k\,z_0^{-k}}{k} -$$

$$6\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k} -$$

$$3\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k} -$$

$$500\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,(\log(18)-z_0)^{k_1}\,(\log(\log(14))-z_0)^{k_2}\,z_0^{-k_1-k_2}}{k_1\,k_2} +$$

$$3\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,(\log(14)-z_0)^{k_1}\,(\log(\log(18))-z_0)^{k_2}\,z_0^{-k_1-k_2}}{k_1\,k_2}\Bigg)\Bigg)\Big/$$

$$\Bigg(500\Bigg(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}\Bigg)$$

$$\Bigg(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}\Bigg)\Bigg)\Bigg)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

Integral representation:

$$\frac{18}{10^3} - \frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}} =$$

$$\left(3\left(\int_0^1\int_0^1 \frac{1}{(1+(-1+\log(18))\,t_1)\,(1+(-1+\log(\log(14)))\,t_2)}\,dt_2\,dt_1 + \int_0^1\int_0^1 \frac{1}{(1+(-1+\log(14))\,t_1)\,(1+(-1+\log(\log(18)))\,t_2)}\,dt_2\,dt_1\right)\right) \Big/ \left(500\left(\int_1^{\log(14)}\frac{1}{t}\,dt\right)\int_1^{\log(\log(18))}\frac{1}{t}\,dt\right)$$

-(34+1)/10^3-3/ [(((ln(ln14) / ln(ln(ln(14)))))) *1/(((ln(ln18) / ln(ln(ln(18))))))]

Input:

$$-\frac{34+1}{10^3} - \frac{3}{\frac{\log(\log(14))}{\log(\log(\log(14)))} \times \frac{1}{\frac{\log(\log(18))}{\log(\log(\log(18)))}}}$$

$\log(x)$ is the natural logarithm

Exact result:

$$-\frac{7}{200} - \frac{3\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}$$

Decimal approximation:

1.618661808791702600993459739806921200486284037140320196941...

1.61866180879…. result that is a very good approximation to the value of the golden ratio 1,618033988749...

Alternate forms:

$$-\frac{7}{200} - \frac{3\log(\log(2)+2\log(3))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(2)+2\log(3)))}$$

$$-\frac{600\log(\log(18))\log(\log(\log(14))) + 7\log(\log(14))\log(\log(\log(18)))}{200\log(\log(14))\log(\log(\log(18)))}$$

- $-((7 \log(\log(2) + \log(7)) \log(\log(\log(2) + 2 \log(3))) + 600 \log(\log(2) + 2 \log(3)) \log(\log(\log(2) + \log(7))))/ (200 \log(\log(2) + \log(7)) \log(\log(\log(2) + 2 \log(3)))))$

- **Alternative representations:**

$$-\frac{34+1}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}} = -\frac{35}{10^3} - \frac{3}{\frac{\log_e(\log(14))}{\frac{\log_e(\log(\log(14)))\log_e(\log(18))}{\log_e(\log(\log(18)))}}}$$

$$-\frac{34+1}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}} = -\frac{35}{10^3} - \frac{3}{\frac{\log(a)\log_a(\log(14))}{\frac{(\log(a)\log_a(\log(\log(14))))(\log(a)\log_a(\log(18)))}{\log(a)\log_a(\log(\log(18)))}}}$$

$$-\frac{34+1}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}} = -\frac{35}{10^3} - -\frac{3}{-\frac{\mathrm{Li}_1(1-\log(14))}{-\frac{\mathrm{Li}_1(1-\log(\log(14)))(-\mathrm{Li}_1(1-\log(18)))}{\mathrm{Li}_1(1-\log(\log(18)))}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

Series representations:

$$-\frac{34+1}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}} = -\frac{7}{200} - \left(3\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(18))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(18))^k}{k}\right) \left(2 i \pi \left\lfloor \frac{\arg(-x+\log(\log(14)))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(\log(14)))^k}{k}\right)\right) / \left(\left(2 i \pi \left\lfloor \frac{\arg(-x+\log(14))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(14))^k}{k}\right) \left(2 i \pi \left\lfloor \frac{\arg(-x+\log(\log(18)))}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} (-x+\log(\log(18)))^k}{k}\right)\right) \quad \text{for } x < 0$$

$$
\begin{aligned}
&-\frac{34+1}{10^3} - \frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}} = -\frac{7}{200} - \\
&\quad\left(3\left(\log(z_0) + \left\lfloor \frac{\arg(\log(18) - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(18) - z_0)^k z_0^{-k}}{k}\right)\right. \\
&\qquad\left(\log(z_0) + \left\lfloor \frac{\arg(\log(\log(14)) - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \right. \\
&\qquad\quad\left.\left.\sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(14)) - z_0)^k z_0^{-k}}{k}\right)\right) \Big/ \\
&\quad\left(\left(\log(z_0) + \left\lfloor \frac{\arg(\log(14) - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (\log(14) - z_0)^k z_0^{-k}}{k}\right)\right. \\
&\qquad\left(\log(z_0) + \left\lfloor \frac{\arg(\log(\log(18)) - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \right. \\
&\qquad\quad\left.\left.\sum_{k=1}^{\infty} \frac{(-1)^k (\log(\log(18)) - z_0)^k z_0^{-k}}{k}\right)\right)
\end{aligned}
$$

$$-\frac{34+1}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}=$$

$$\begin{aligned}
-\Bigg(\Bigg(&2428\,\pi^2\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor^2-2428\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\log(z_0)-\\
&607\log^2(z_0)+14\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}+\\
&7\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}+1200\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\\
&\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(18)-z_0)^k\,z_0^{-k}}{k}+600\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(18)-z_0)^k\,z_0^{-k}}{k}+\\
&1200\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(14))-z_0)^k\,z_0^{-k}}{k}+\\
&600\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(14))-z_0)^k\,z_0^{-k}}{k}+\\
&14\,i\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}+\\
&7\log(z_0)\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}-\\
&600\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,(\log(18)-z_0)^{k_1}\,(\log(\log(14))-z_0)^{k_2}\,z_0^{-k_1-k_2}}{k_1\,k_2}-\\
&7\sum_{k_1=1}^{\infty}\sum_{k_2=1}^{\infty}\frac{(-1)^{k_1+k_2}\,(\log(14)-z_0)^{k_1}\,(\log(\log(18))-z_0)^{k_2}\,z_0^{-k_1-k_2}}{k_1\,k_2}\Bigg)\Bigg/\\
&\Bigg(200\left(2\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-i\log(z_0)+i\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(14)-z_0)^k\,z_0^{-k}}{k}\right)\\
&\left(2\,\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\,\pi}\right\rfloor-i\log(z_0)+i\sum_{k=1}^{\infty}\frac{(-1)^k\,(\log(\log(18))-z_0)^k\,z_0^{-k}}{k}\right)\Bigg)\Bigg)
\end{aligned}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

Integral representation:

$$-\frac{34+1}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}=$$

$$-\left(\left(\int_0^1\int_0^1\frac{1}{(1+(-1+\log(18))\,t_1)\,(1+(-1+\log(\log(14)))\,t_2)}\,dt_2\,dt_1+\int_0^1\int_0^1\frac{1}{(1+(-1+\log(14))\,t_1)\,(1+(-1+\log(\log(18)))\,t_2)}\,dt_2\,dt_1\right)\Big/\left(200\left(\int_1^{\log(14)}\frac{1}{t}\,dt\right)\int_1^{\log(\log(18))}\frac{1}{t}\,dt\right)\right)$$

We have also that:

2sqrt((((((((6*(((((-8/10^3+-3/ [(((ln(ln14) / ln(ln(ln(14)))))) *1/(((ln(ln18) / ln(ln(ln(18))))))]))))))))))))

Input:

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\log(\log(\log(14)))}\times\frac{1}{\frac{\log(\log(18))}{\log(\log(\log(18)))}}}\right)}$$

$\log(x)$ is the natural logarithm

Exact result:

$$2\sqrt{6\left(-\frac{1}{125}-\frac{3\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}\right)}$$

Decimal approximation:

- 6.2845750382186433420858478772075439505724397207377700432 51...

6.284575038… = C = 2πr

Alternate forms:

$$2\sqrt{-\frac{6}{125}-\frac{18\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}}$$

-

$$\frac{2}{5}\sqrt{\frac{6\left(-375\log(\log(18))\log(\log(\log(14)))-\log(\log(14))\log(\log(\log(18)))\right)}{5\log(\log(14))\log(\log(\log(18)))}}$$

- $$\frac{2}{5}\sqrt{((6(-\log(\log(14))\log(\log(\log(2)+2\log(3)))-375\log(\log(2)+2\log(3))\log(\log(\log(14)))))/(5\log(\log(14))\log(\log(\log(2)+2\log(3)))))}$$

- **Alternative representations:**

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}}\right)}=2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log_e(\log(14))}{\frac{\log_e(\log(\log(14)))\log_e(\log(18))}{\log_e(\log(\log(18)))}}}\right)}$$

- $$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}}\right)}=$$

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(a)\log_a(\log(14))}{\frac{(\log(a)\log_a(\log(\log(14))))(\log(a)\log_a(\log(18)))}{\log(a)\log_a(\log(\log(18)))}}}\right)}$$

- $$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(18))\log(\log(\log(14)))}{\log(\log(\log(18)))}}}\right)}=$$

$$2\sqrt{6\left(-\frac{8}{10^3}--\frac{3}{-\frac{\mathrm{Li}_1(1-\log(14))}{-\frac{\mathrm{Li}_1(1-\log(\log(14)))(-\mathrm{Li}_1(1-\log(18)))}{\mathrm{Li}_1(1-\log(\log(18)))}}}\right)}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

-

Series representations:

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}}\right)}=2\sqrt{6}$$

$$\sqrt{\left(-\frac{1}{125}-\left(3\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(18))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(18))^k}{k}\right)\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(\log(14)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(14)))^k}{k}\right)\right)\Big/\left(\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(14))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(14))^k}{k}\right)\left(2 i \pi\left\lfloor\frac{\arg(-x+\log(\log(18)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(18)))^k}{k}\right)\right)\right)} \text{ for } x<0$$

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}}\right)}=2\sqrt{6}$$

$$\sqrt{\left(-\frac{1}{125}-\left(3\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right)\Big/\left(\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\left(2 i \pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)\right)}$$

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}}\right)} =$$

$$2\sqrt{6}\sqrt{\left(-\frac{1}{125}-\left(3\left(\log(z_0)+\left\lfloor\frac{\arg(\log(18)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(\log(\log(14))-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right)\Big/\left(\left(\log(z_0)+\left\lfloor\frac{\arg(\log(14)-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(\log(\log(18))-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)\right)}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

Integral representation:

$$2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(18))\log(\log(\log(14)))}}{\log(\log(\log(18)))}}\right)} =$$

$$\frac{2}{5}\sqrt{\frac{6}{5}}\sqrt{\left(\left(\int_0^1\int_0^1\frac{1}{(1+(-1+\log(18))t_1)(1+(-1+\log(\log(14)))t_2)}dt_2\,dt_1+\int_0^1\int_0^1\frac{1}{(1+(-1+\log(14))t_1)(1+(-1+\log(\log(18)))t_2)}dt_2\,dt_1\right)\Big/\left(\left(\int_1^{\log(14)}\frac{1}{t}dt\right)\int_1^{\log(\log(18))}\frac{1}{t}dt\right)\right)}$$

The radius of the circumference is:

1/(2Pi) * 2sqrt((((((((6*(((((-8/10^3+-3/ [(((ln(ln14) / ln(ln(ln(14))))) *1/(((ln(ln18) / ln(ln(ln(18))))))]))))))))))))

Input:

$$\frac{1}{2\pi}\times 2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\log(\log(\log(14)))}\times\frac{1}{\frac{\log(\log(18))}{\log(\log(\log(18)))}}}\right)}$$

$\log(x)$ is the natural logarithm

Exact result:

$$\frac{\sqrt{6\left(-\frac{1}{125}-\frac{3\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}\right)}}{\pi}$$

Decimal approximation:

1.000221182564434135948850359752650016695948332391919191633...

1.0002211825644…. = radius

- **Alternate forms:**

$$\frac{\sqrt{-\frac{6}{125}-\frac{18\log(\log(18))\log(\log(\log(14)))}{\log(\log(14))\log(\log(\log(18)))}}}{\pi}$$

- $$\frac{\sqrt{\frac{6(-375\log(\log(18))\log(\log(\log(14)))-\log(\log(14))\log(\log(\log(18))))}{5\log(\log(14))\log(\log(\log(18)))}}}{5\pi}$$

- $$\frac{\sqrt{\frac{6(-\log(\log(14))\log(\log(\log(2)+2\log(3)))-375\log(\log(2)+2\log(3))\log(\log(\log(14))))}{5\log(\log(14))\log(\log(\log(2)+2\log(3)))}}}{5\pi}$$

- **Alternative representations:**

$$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}\right)}}{2\pi}=\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log_e(\log(14))}{\frac{\log_e(\log(\log(14)))\log_e(\log(18))}{\log_e(\log(\log(18)))}}}\right)}}{2\pi}$$

- $$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}\right)}}{2\pi}=\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(a)\log_a(\log(14))}{\frac{(\log(a)\log_a(\log(\log(14))))(\log(a)\log_a(\log(18)))}{\log(a)\log_a(\log(\log(18)))}}}\right)}}{2\pi}$$

- $$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}\right)}}{2\pi}=\frac{2\sqrt{6\left(-\frac{8}{10^3}--\frac{3}{-\frac{\mathrm{Li}_1(1-\log(14))}{\frac{\mathrm{Li}_1(1-\log(\log(14)))(-\mathrm{Li}_1(1-\log(18)))}{\mathrm{Li}_1(1-\log(\log(18)))}}}\right)}}{2\pi}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}\right)}}{2\pi}=\frac{1}{\pi}\sqrt{6}$$

$$\sqrt{\left(-\frac{1}{125}-\left(3\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(18))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(18))^k}{k}\right)\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(\log(14)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(14)))^k}{k}\right)\right)\Big/\left(\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(14))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(14))^k}{k}\right)\left(2 i\pi\left\lfloor\frac{\arg(-x+\log(\log(18)))}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}(-x+\log(\log(18)))^k}{k}\right)\right)\right)} \text{ for } x<0$$

$$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\log(\log(14))}{\frac{\log(\log(\log(14)))\log(\log(18))}{\log(\log(\log(18)))}}}\right)}}{2\pi}=\frac{1}{\pi}\sqrt{6}$$

$$\sqrt{\left(-\frac{1}{125}-\left(3\left(2 i\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\left(2 i\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\right)\Big/\left(\left(2 i\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\left(2 i\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor+\log(z_0)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)\right)}$$

$$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(\log(14)))\log(\log(18))}}{\log(\log(\log(18)))}}\right)}}{2\pi}=\frac{1}{\pi}$$

$$\sqrt{6}\sqrt{\left(-\frac{1}{125}-\left(3\left(\log(z_0)+\left\lfloor\frac{\arg(\log(18)-z_0)}{2\pi}\right\rfloor\right)\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(18)-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(\log(\log(14))-z_0)}{2\pi}\right\rfloor\right.}$$
$$\left.\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(14))-z_0)^k z_0^{-k}}{k}\right)\Big/$$
$$\left(\left(\log(z_0)+\left\lfloor\frac{\arg(\log(14)-z_0)}{2\pi}\right\rfloor\right)\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\right.$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k(\log(14)-z_0)^k z_0^{-k}}{k}\right)\left(\log(z_0)+\left\lfloor\frac{\arg(\log(\log(18))-z_0)}{2\pi}\right\rfloor\right.$$
$$\left.\left.\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(\log(\log(18))-z_0)^k z_0^{-k}}{k}\right)\right)\right)$$

arg(z) is the complex argument

$\lfloor x\rfloor$ is the floor function

Integral representation:

$$\frac{2\sqrt{6\left(-\frac{8}{10^3}-\frac{3}{\frac{\frac{\log(\log(14))}{\log(\log(\log(14)))\log(\log(18))}}{\log(\log(\log(18)))}}\right)}}{2\pi}=\frac{1}{5\pi}$$

$$\sqrt{\frac{6}{5}}\sqrt{\left(\left(\int_0^1\int_0^1\frac{1}{(1+(-1+\log(18))t_1)(1+(-1+\log(\log(14)))t_2)}dt_2\,dt_1+\right.\right.}$$
$$\left.\int_0^1\int_0^1\frac{1}{(1+(-1+\log(14))t_1)(1+(-1+\log(\log(18)))t_2)}dt_2\,dt_1\right)\Big/$$
$$\left(\left(\int_1^{\log(14)}\frac{1}{t}\,dt\right)\int_1^{\log(\log(18))}\frac{1}{t}\,dt\right)\right)$$

We note that 1.0002211825644… is very near to the value of ζ(12). Indeed:

zeta (12)

Input:

$\zeta(12)$

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

Exact result:

$$\frac{691\,\pi^{12}}{638512875}$$

Decimal approximation:

1.000246086553308048298637998047739670960416088458003404533...

1.0002460865533…

We observe that, from the Ramanujan continued fraction:

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

From the reciprocal, we obtain the following result:

1 / 0.9991104684

Input interpretation:

$$\frac{1}{0.9991104684}$$

Result:

1.000890323570950585387740893777627442983561075857505248015...

1.00089032357…

and by

-(47+18)/10^5+(1/0.9991104684)

where 47 and 18 are Lucas numbers, we obtain:

Input interpretation:

$$-\frac{47+18}{10^5}+\frac{1}{0.9991104684}$$

Result:

1.000240323570950585387740893777627442983561075857505248015...

1.00024032357…

This result is very near to the value of ζ(12) 1.0002460865533…and to the radius of the above circumference that is: 1.0002211825644…

Explicitly:

exp((((-Pi)*1/sqrt(5))))/(((((sqrt(5)*1/((((1+(((5^0.75*(golden ratio)^2.5-1)))^1/5))))) - golden ratio+1))))

Input:

$$\frac{\exp\left(-\pi\times\frac{1}{\sqrt{5}}\right)}{\sqrt{5}\times\frac{1}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1}$$

ϕ is the golden ratio

Result:

0.999110468396793152282141577538458189641715455753675872795...

0.999110468396…

Series representations:

$$\frac{\exp\left(-\frac{\pi}{\sqrt{5}}\right)}{\frac{\sqrt{5}}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1}=$$

$$-\frac{\left(1+\sqrt[5]{-1+3.3437\,\phi^{2.5}}\right)\exp\left(-\frac{\pi}{\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}\right)}{-1+\phi-\sqrt[5]{-1+3.3437\,\phi^{2.5}}+\phi\sqrt[5]{-1+3.3437\,\phi^{2.5}}-\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}$$

•

$$\frac{\exp\left(-\frac{\pi}{\sqrt{5}}\right)}{\frac{\sqrt{5}}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1} =$$

$$-\frac{\left(1+\sqrt[5]{-1+3.3437\,\phi^{2.5}}\right)\exp\left(-\frac{\pi}{\sqrt{4}\,\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)}{-1+\phi-\sqrt[5]{-1+3.3437\,\phi^{2.5}}+\phi\,\sqrt[5]{-1+3.3437\,\phi^{2.5}}-\sqrt{4}\,\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}$$

•

$$\frac{\exp\left(-\frac{\pi}{\sqrt{5}}\right)}{\frac{\sqrt{5}}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1} =$$

$$-\left(\left(\left(1+\sqrt[5]{-1+3.3437\,\phi^{2.5}}\right)\exp\left(-\frac{\pi}{\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}\right)\right)\Big/\left(-1+\phi-\sqrt[5]{-1+3.3437\,\phi^{2.5}}+\phi\,\sqrt[5]{-1+3.3437\,\phi^{2.5}}-\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\right) \quad \text{for not } ((z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

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

-(47+18)/10^5+ 1/[exp((((-Pi)/sqrt(5))))*1/(((((sqrt(5)*1/((((1+(((5^0.75*(golden ratio)^2.5-1)))^1/5))))) - golden ratio+1))))]

Where 47 and 18 are Lucas numbers, we obtain:

Input:

$$-\frac{47+18}{10^5}+\frac{1}{\exp\left(-\frac{\pi}{\sqrt{5}}\right)\times\frac{1}{\sqrt{5}\times\frac{1}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1}}$$

ϕ is the golden ratio

Result:

1.000240323574163145911824361683315922732170929436105556831...

1.000240323574….

Series representations:

$$-\frac{47+18}{10^5}+\frac{1}{\frac{\exp\left(-\frac{\pi}{\sqrt{5}}\right)}{\frac{\sqrt{5}}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1}}=$$

$$-\left(\left(-20\,000+20\,000\,\phi-20\,000\sqrt[5]{-1+3.3437\,\phi^{2.5}}+20\,000\,\phi\sqrt[5]{-1+3.3437\,\phi^{2.5}}+\right.\right.$$

$$13\exp\left(-\frac{\pi}{\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}\right)+13\sqrt[5]{-1+3.3437\,\phi^{2.5}}$$

$$\left.\exp\left(-\frac{\pi}{\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}\right)-20\,000\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)\Bigg/$$

$$\left.\left(20\,000\left(1+\sqrt[5]{-1+3.3437\,\phi^{2.5}}\right)\exp\left(-\frac{\pi}{\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}\right)\right)\right)$$

$$-\frac{47+18}{10^5}+\frac{1}{\frac{\exp\left(-\frac{\pi}{\sqrt{5}}\right)}{\frac{\sqrt{5}}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1}}=$$

$$-\left(\left(-20\,000+20\,000\,\phi-20\,000\sqrt[5]{-1+3.3437\,\phi^{2.5}}+20\,000\,\phi\sqrt[5]{-1+3.3437\,\phi^{2.5}}+13\exp\left(-\frac{\pi}{\sqrt{4}\,\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)+13\sqrt[5]{-1+3.3437\,\phi^{2.5}}\exp\left(-\frac{\pi}{\sqrt{4}\,\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)-20\,000\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\Bigg/\left(20\,000\left(1+\sqrt[5]{-1+3.3437\,\phi^{2.5}}\right)\exp\left(-\frac{\pi}{\sqrt{4}\,\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}\right)\right)\right)$$

$$-\frac{47+18}{10^5}+\frac{1}{\frac{\exp\left(-\frac{\pi}{\sqrt{5}}\right)}{\frac{\sqrt{5}}{1+\sqrt[5]{5^{0.75}\,\phi^{2.5}-1}}-\phi+1}}=$$

$$-\left(\left(-20\,000+20\,000\,\phi-20\,000\sqrt[5]{-1+3.3437\,\phi^{2.5}}+20\,000\,\phi\sqrt[5]{-1+3.3437\,\phi^{2.5}}+13\exp\left(-\frac{\pi}{\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}\right)+13\sqrt[5]{-1+3.3437\,\phi^{2.5}}\exp\left(-\frac{\pi}{\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}\right)-20\,000\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\Bigg/\left(20\,000\left(1+\sqrt[5]{-1+3.3437\,\phi^{2.5}}\right)\exp\left(-\frac{\pi}{\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}\right)\right)\right)$$

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

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

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

From the radius 1.0002211825644…, computing the mass and temperature, considering the brane a black hole, we obtain, by the Ramanujan-Nardelli mock formula, the golden ratio. Indeed:

sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(6.736174e+26)* sqrt[[-((((0.0001821810 * 4*Pi*(1.000222)^3-(1.000222)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times\frac{1}{6.736174\times 10^{26}}\sqrt{-\frac{0.0001821810\times 4\,\pi\times 1.000222^3-1.000222^2}{6.67\times 10^{-11}}}}}$$

Result:

1.61825...

1.61825…

And the conjugate:

1/ sqrt[[[[1/(((((((4*1.962364415e+19)/(5*0.0864055^2)))*1/(6.736174e+26)* sqrt[[-((((0.0001821810 * 4*Pi*(1.000222)^3-(1.000222)^2))))) / ((6.67*10^-11))]]]]]

Input interpretation:

$$\frac{1}{\sqrt{\frac{1}{\frac{4\times 1.962364415\times 10^{19}}{5\times 0.0864055^2}\times\frac{1}{6.736174\times 10^{26}}\sqrt{-\frac{0.0001821810\times 4\,\pi\times 1.000222^3-1.000222^2}{6.67\times 10^{-11}}}}}}$$

Result:

0.617952...

0.617952…

From:

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AUTOMATA THEORY

FAST EVALUATION OF THE HURWITZ ZETA FUNCTION AND DIRICHLET L-SERIES[1]

E. A. Karatsuba UDC 621.391.1:681.327

We have that:

$$1 \leq j \leq s, \; n \geq 2s \log 2s, \; r \geq n,$$

$$r \geq 3n, \quad n \geq 2s \log 2s, \quad s \geq 2, \quad 1 \leq j \leq s.$$

$$B_j' = -e^{-t} \log^j t \Big|_n^{\infty} + j \int_n^{\infty} e^{-t} t^{-1} \log^{j-1} t \, dt \leq \ldots$$

$$\ldots \leq e^{-n} \log^j n \frac{1 - \left(\dfrac{j}{n \log n}\right)^j}{1 - \dfrac{j}{n \log n}} \leq \frac{5}{3} e^{-n} \log^s n. \qquad (17)$$

For s = 2, n = 5.545177444479, we obtain:

4ln(4)

Input:

4 log(4)

log(x) is the natural logarithm

Decimal approximation:

5.545177444479562475337856971665412544604001074882042032965...

5.545177444479…..

Property:

4 log(4) is a transcendental number

5/3*e^(-5.545177444479) * ln^2(5.545177444479)

Input interpretation:

$$\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}$$

$\log(x)$ is the natural logarithm

Result:

0.0191023727928…

0.0191023727928….

- **Alternative representations:**

$$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\log_e^2(5.5451774444790000)}{3\,e^{5.5451774444790000}}$$

-

$$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\left(\log(a)\log_a(5.5451774444790000)\right)^2}{3\,e^{5.5451774444790000}}$$

-

$$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\left(-\text{Li}_1(-4.5451774444790000)\right)^2}{3\,e^{5.5451774444790000}}$$

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

$\text{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842\,k}}{k}\right)^2}{3\,e^{5.5451774444790000}}$$

- $$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\left(2\,i\,\pi\left\lfloor\frac{\arg(5.5451774444790000-x)}{2\,\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-x)^k\,x^{-k}}{k}\right)^2}{3\,e^{5.5451774444790000}} \quad \text{for } x < 0$$

- $$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{1}{3\,e^{5.5451774444790000}}\,5\left(\log(z_0) + \left\lfloor\frac{\arg(5.5451774444790000 - z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000 - z_0)^k\,z_0^{-k}}{k}\right)^2$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}{3\,e^{5.5451774444790000}}$$

- $$\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5 = \frac{5\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1.5140667685568842\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}{12\,e^{5.5451774444790000}\,i^2\,\pi^2} \quad \text{for } -1 < \gamma < 0$$

$\Gamma(x)$ is the gamma function

1/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479)))))

Input interpretation:

$$\frac{1}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}$$

$\log(x)$ is the natural logarithm

Result:

52.3495175623...

52.3495175623….

- **Alternative representations:**

$$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{1}{\frac{5\log_e^2(5.5451774444790000)}{3\,e^{5.5451774444790000}}}$$

- $$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{1}{\frac{5(\log(a)\log_a(5.5451774444790000))^2}{3\,e^{5.5451774444790000}}}$$

- $$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{1}{\frac{5(-\text{Li}_1(-4.5451774444790000))^2}{3\,e^{5.5451774444790000}}}$$

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

$\text{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{3\,e^{5.5451774444790000}}{5\left(\log(4.5451774444790000) - \sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842\,k}}{k}\right)^2}$$

-

$$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{3\,e^{5.5451774444790000}}{5\left(2\,i\,\pi\left\lfloor\frac{\arg(5.5451774444790000-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-x)^k\,x^{-k}}{k}\right)^2} \quad \text{for } x<0$$

- $$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \left(3\,e^{5.5451774444790000}\right) \Big/ \left(5\left(\log(z_0)+\left\lfloor\frac{\arg(5.5451774444790000-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-z_0)^k\,z_0^{-k}}{k}\right)^2\right)$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{3\,e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}$$

- $$\frac{1}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = \frac{12\,e^{5.5451774444790000}\,i^2\,\pi^2}{5\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1.5140667685568842\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

1/(29+3) *1/(((((5/3*e^(-5.545177444479) * ln^2(5.545177444479)))))

Where 3 and 29 are Lucas numbers

Input interpretation:

$$\frac{1}{29+3} \times \frac{1}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}$$

$\log(x)$ is the natural logarithm

Result:

1.63592242382...

1.6359224…

- **Alternative representations:**

$$\frac{1}{\frac{1}{3}\left(5\,e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)(29+3)} = \frac{1}{\frac{32\left(5\log_e^2(5.5451774444790000)\right)}{3\,e^{5.5451774444790000}}}$$

- $$\frac{1}{\frac{1}{3}\left(5\,e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)(29+3)} = \frac{1}{\frac{32\left(5\left(\log(a)\log_a(5.5451774444790000)\right)^2\right)}{3\,e^{5.5451774444790000}}}$$

- $$\frac{1}{\frac{1}{3}\left(5\,e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)(29+3)} = \frac{1}{\frac{32\left(5\left(-\mathrm{Li}_1(-4.5451774444790000)\right)^2\right)}{3\,e^{5.5451774444790000}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{1}{\frac{1}{3}\left(5\, e^{-5.5451774444790000} \log^2(5.5451774444790000)\right)(29+3)} = \frac{3\, e^{5.5451774444790000}}{160\left(\log(4.5451774444790000) - \sum_{k=1}^{\infty} \frac{(-1)^k e^{-1.5140667685568842\, k}}{k}\right)^2}$$

- $$\frac{1}{\frac{1}{3}\left(5\, e^{-5.5451774444790000} \log^2(5.5451774444790000)\right)(29+3)} = \frac{3\, e^{5.5451774444790000}}{160\left(2\, i\, \pi \left\lfloor \frac{\arg(5.5451774444790000 - x)}{2\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (5.5451774444790000 - x)^k x^{-k}}{k}\right)^2} \quad \text{for } x < 0$$

- $$\frac{1}{\frac{1}{3}\left(5\, e^{-5.5451774444790000} \log^2(5.5451774444790000)\right)(29+3)} = \left(3\, e^{5.5451774444790000}\right) \Big/ \left(160\left(\log(z_0) + \left\lfloor \frac{\arg(5.5451774444790000 - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (5.5451774444790000 - z_0)^k z_0^{-k}}{k}\right)^2\right)$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$\frac{1}{\frac{1}{3}\left(5\, e^{-5.5451774444790000} \log^2(5.5451774444790000)\right)(29+3)} = \frac{3\, e^{5.5451774444790000}}{160\left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2}$$

- $$\frac{1}{\frac{1}{3}\left(5\, e^{-5.5451774444790000} \log^2(5.5451774444790000)\right)(29+3)} = \frac{3\, e^{5.5451774444790000}\, i^2 \pi^2}{40\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-1.5140667685568842\, s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds\right)^2} \quad \text{for } -1 < \gamma < 0$$

$\Gamma(x)$ is the gamma function

(199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479)))))

Where 11, 29 and 199 are Lucas numbers

Input interpretation:

$$(199+11)+\frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}$$

$\log(x)$ is the natural logarithm

Result:

1728.13600931...

1728.136…

This result is very near to the mass of candidate glueball $f_0(1710)$ 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

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Alternative representations:

$$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}=210+\frac{29}{\frac{5\log_e^2(5.5451774444790000)}{3\,e^{5.5451774444790000}}}$$

•

$$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\frac{29}{\frac{5\left(\log(a)\log_a(5.5451774444790000)\right)^2}{3\,e^{5.5451774444790000}}}$$

- $$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\frac{29}{\frac{5\left(-\text{Li}_1(-4.5451774444790000)\right)^2}{3\,e^{5.5451774444790000}}}$$

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

$\text{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\frac{87\,e^{5.5451774444790000}}{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k\,e^{-1.5140667685568842\,k}}{k}\right)^2}$$

- $$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\frac{87\,e^{5.5451774444790000}}{5\left(2\,i\,\pi\left\lfloor\frac{\arg(5.5451774444790000-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-x)^k\,x^{-k}}{k}\right)^2} \quad \text{for } x<0$$

- $$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\left(87\,e^{5.5451774444790000}\right)\Big/\left(5\left(\log(z_0)+\left\lfloor\frac{\arg(5.5451774444790000-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-z_0)^k\,z_0^{-k}}{k}\right)^2\right)$$

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\frac{87\,e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}$$

- $$(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5} = 210+\frac{348\,e^{5.5451774444790000}\,i^2\,\pi^2}{5\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-1.5140667685568842\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

((((199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479))))))))^1/15

Input interpretation:

$$\sqrt[15]{(199+11)+\frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}}$$

$\log(x)$ is the natural logarithm

Result:

1.643760454414...

1.643760454414.... ≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934$ ...

29/10^3+((((199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479))))))))^1/15

Input interpretation:

$$\frac{29}{10^3} + \sqrt[15]{(199+11) + \frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}}$$

$\log(x)$ is the natural logarithm

Result:

1.672760454414...

1.672760454414…. result very near to the proton mass

- **Alternative representations:**

$$\frac{29}{10^3} + \sqrt[15]{(199+11) + \frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = \frac{29}{10^3} + \sqrt[15]{210 + \frac{29}{\frac{5\log_e^2(5.5451774444790000)}{3\,e^{5.5451774444790000}}}}$$

-

$$\frac{29}{10^3} + \sqrt[15]{(199+11) + \frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = \frac{29}{10^3} + \sqrt[15]{210 + \frac{29}{\frac{5(\log(a)\log_a(5.5451774444790000))^2}{3\,e^{5.5451774444790000}}}}$$

-

$$\frac{29}{10^3} + \sqrt[15]{(199+11) + \frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = \frac{29}{10^3} + \sqrt[15]{210 + \frac{29}{\frac{5(-\text{Li}_1(-4.5451774444790000))^2}{3\,e^{5.5451774444790000}}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{29}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = \frac{29}{1000}+\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842\,k}}{k}\right)^2}}$$

-

$$\frac{29}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = \frac{29}{1000}+\left(210+\left(87\,e^{5.5451774444790000}\right)\Big/\left(5\left(2\,i\,\pi\left\lfloor\frac{\arg(5.5451774444790000-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(5.5451774444790000-x)^k x^{-k}}{k}\right)^2\right)\right)\text{^}(1/15) \quad \text{for } x<0$$

-

$$\frac{29}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = \frac{29}{1000}+\left(210+\left(87\,e^{5.5451774444790000}\right)\Big/\left(5\left(\log(z_0)+\left\lfloor\frac{\arg(5.5451774444790000-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k(5.5451774444790000-z_0)^k z_0^{-k}}{k}\right)^2\right)\right)\text{^}(1/15)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$\frac{29}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}=$$

$$\frac{29}{1000}+\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}}$$

- $$\frac{29}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}=$$

$$\frac{29}{1000}+\sqrt[15]{210+\frac{348\,e^{5.5451774444790000}\,i^2\,\pi^2}{5\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1.5140667685568842\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

-(18+7)/10^3+((((199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479))))))))^1/15

Where 7, 11, 18, 29 and 199 are Lucas numbers

Input interpretation:

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}}$$

$\log(x)$ is the natural logarithm

Result:

1.618760454414...

1.618760454414….

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

Alternative representations:

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = -\frac{25}{10^3}+\sqrt[15]{210+\frac{29}{\frac{5\log_e^2(5.5451774444790000)}{3\,e^{5.5451774444790000}}}}$$

•

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = -\frac{25}{10^3}+\sqrt[15]{210+\frac{29}{\frac{5(\log(a)\log_a(5.5451774444790000))^2}{3\,e^{5.5451774444790000}}}}$$

•

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = -\frac{25}{10^3}+\sqrt[15]{210+\frac{29}{\frac{5(-\mathrm{Li}_1(-4.5451774444790000))^2}{3\,e^{5.5451774444790000}}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

•

Series representations:

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}} = -\frac{1}{40}+\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842\,k}}{k}\right)^2}}$$

•

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}=$$

$$-\frac{1}{40}+\left(210+\left(87\,e^{5.5451774444790000}\right)\Big/\left(5\left(2\,i\,\pi\left\lfloor\frac{\arg(5.5451774444790000-x)}{2\,\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-x)^k\,x^{-k}}{k}\right)^2\right)\right)\hat{}\,(1/15)\quad\text{for } x<0$$

•

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}=$$

$$-\frac{1}{40}+\left(210+\left(87\,e^{5.5451774444790000}\right)\Big/\left(5\left(\log(z_0)+\left\lfloor\frac{\arg(5.5451774444790000-z_0)}{2\,\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k\,(5.5451774444790000-z_0)^k\,z_0^{-k}}{k}\right)^2\right)\right)\hat{}\,(1/15)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

•

Integral representations:

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}=$$

$$-\frac{1}{40}+\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}}$$

•

$$-\frac{18+7}{10^3}+\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}=$$

$$-\frac{1}{40}+\sqrt[15]{210+\frac{348\,e^{5.5451774444790000}\,i^2\,\pi^2}{5\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1.5140667685568842\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

2sqrt((((((6(((((199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479))))))))^1/15))))))

Input interpretation:

$$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}}}$$

$\log(x)$ is the natural logarithm

Result:

6.2809434725960...

6.2809434725960…. = 2πr = C

- **Alternative representations:**

$$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}}=$$

$$2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5\log_e^2(5.5451774444790000)}{3\,e^{5.5451774444790000}}}}}$$

-

$$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5(\log(a)\log_a(5.5451774444790000))^2}{3e^{5.5451774444790000}}}}}$$

- $$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5(-\text{Li}_1(-4.5451774444790000))^2}{3e^{5.5451774444790000}}}}}$$

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

$\text{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}} \sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}\right)^{-k}$$

- $$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842k}}{k}\right)^2}}}$$

- $$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{-1+6\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+6\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

- **Integral representations:**

$$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{6\sqrt[15]{210+\frac{87\,e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}}}$$

- $$2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{1}{3}\left(e^{-5.5451774444790000}\log^2(5.5451774444790000)\right)5}}} = 2\sqrt{6\sqrt[15]{210+\frac{348\,e^{5.5451774444790000}\,i^2\,\pi^2}{5\left(\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-1.5140667685568842\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}}} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

(2Pi)*1/ [2sqrt((((((6((((199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479))))))))^1/15))))))]

Input interpretation:

$$(2\pi)\times\frac{1}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}}}}$$

log(x) is the natural logarithm

Result:

1.0003569264066...

1.0003569264066…. = radius

-

Alternative representations:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}=\frac{2\pi}{2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5\log_e^2(5.5451774444790000)}{3e^{5.5451774444790000}}}}}}$$

-

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}=\frac{2\pi}{2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5(-\text{Li}_1(-4.5451774444790000))^2}{3e^{5.5451774444790000}}}}}}$$

-

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}} = \frac{2\pi}{2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5(\log(a)\log_a(5.5451774444790000))^2}{3e^{5.5451774444790000}}}}}}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

-

Series representations:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}} = \frac{\pi}{\sqrt{6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842k}}{k}\right)^2}}}}$$

-

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}} = \pi \Bigg/ \left(\sqrt{-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}\right)^{-k}\right)$$

-

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}=$$

$$\pi\Bigg/\left(\sqrt{-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

- **Integral representations:**

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}=\frac{\pi}{\sqrt{6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}}}}$$

-

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}=\frac{\pi}{\sqrt{6\sqrt[15]{210+\frac{348e^{5.5451774444790000}i^2\pi^2}{5\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-1.5140667685568842s}\Gamma(-s)^2\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}}}}\quad\text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

We observe that 1.0003569264066…. = radius is a value very near to

$$\zeta(12) = 1 + \frac{1}{2^{12}} + \frac{1}{3^{12}} + \cdots = \frac{691\pi^{12}}{638512875} = 1.000246\ldots$$

And:

1/(2Pi)*[2sqrt((((((6((((199+11)+29/((((5/3*e^(-5.545177444479) * ln^2(5.545177444479))))))))^1/15))))))]

Input interpretation:

$$\frac{1}{2\pi}\left(2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{\frac{5}{3}\log^2(5.545177444479)}{e^{5.545177444479}}}}}\right)$$

log(x) is the natural logarithm

Result:

0.99964320094443...

0.99964320094….

- **Alternative representations:**
- More

$$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi} = \frac{2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5\log_e^2(5.5451774444790000)}{3e^{5.5451774444790000}}}}}}{2\pi}$$

-

$$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi} = \frac{2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5(\log(a)\log_a(5.5451774444790000))^2}{3e^{5.5451774444790000}}}}}}{2\pi}$$

- $$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi}=$$
$$\frac{2\sqrt{6\sqrt[15]{210+\frac{29}{\frac{5(-\mathrm{Li}_1(-4.5451774444790000))^2}{3e^{5.5451774444790000}}}}}}{2\pi}$$

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

$\mathrm{Li}_n(x)$ is the polylogarithm function

- **Series representations:**

$$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi}=$$
$$\frac{1}{\pi}\sqrt{-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}\right)^{-k}$$

- $$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi}=$$
$$\frac{\sqrt{6\sqrt[15]{210+\frac{87e^{5.5451774444790000}}{5\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842k}}{k}\right)^2}}}}{\pi}$$

-

$$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi} = \frac{1}{\pi}\sqrt{-1+6\sqrt[15]{210+\frac{87 e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-1+6\sqrt[15]{210+\frac{87 e^{5.5451774444790000}}{5\log^2(5.5451774444790000)}}\right)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$\binom{n}{m}$ is the binomial coefficient

$n!$ is the factorial function

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

More information »

- **Integral representations:**

$$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi} = \frac{\sqrt{6\sqrt[15]{210+\frac{87 e^{5.5451774444790000}}{5\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}}}}{\pi}$$

-

$$\frac{2\sqrt{6\sqrt[15]{(199+11)+\frac{29}{\frac{5}{3}e^{-5.5451774444790000}\log^2(5.5451774444790000)}}}}{2\pi} = \frac{\sqrt{6\sqrt[15]{210+\frac{348 e^{5.5451774444790000} i^2\pi^2}{5\left(\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-1.5140667685568842 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds\right)^2}}}}{\pi} \quad \text{for } -1<\gamma<0$$

$\Gamma(x)$ is the gamma function

i is the imaginary unit

This result 0.99964320094… is very near to the value of the following Rogers-Ramanujan continued fraction

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

Now, we have that:

$$A_j'' \leq \frac{1}{(r+1)!}\left(\left|\int_0^1 t^{r+a}\log^j t\,dt\right|+\left|\int_1^n t^{r+a}\log^j t\,dt\right|\right)\leq\frac{1}{(r+2)!}(1+n^{r+2}\log^s n). \tag{19}$$

For s = 2, n = 5.545177444479 and r = 6, we obtain:

1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))

Input interpretation:

$$\frac{1}{(6+2)!}\left(1+5.545177444479^8\log^2(5.545177444479)\right)$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

65.0551613614…

65.0551613614…

Alternative representations:

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \frac{1+5.5451774444790000^8 (\log(a)\log_a(5.5451774444790000))^2}{\Gamma(9)}$$

-

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{7!! \times 8!!}$$

-

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \frac{1+5.5451774444790000^8 \log_e^2(5.5451774444790000)}{(1)_8}$$

$\Gamma(x)$ is the gamma function

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

$n!!$ is the double factorial function

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

-

Series representations:

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \frac{1+893\,971.3161384143 \log^2(5.5451774444790000)}{\sum_{k=0}^{\infty} \frac{(8-n_0)^k \Gamma^{(k)}(1+n_0)}{k!}}$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 8)$

-

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \left(893\,971.31613841\left(1.11860412291480\times 10^{-6} + 1.00000000000000 \log^2(4.5451774444790000) - 2.00000000000000 \log(4.5451774444790000) \sum_{k=1}^{\infty} \frac{(-1)^k e^{-1.5140667685568842\,k}}{k} + 1.00000000000000 \left(\sum_{k=1}^{\infty} \frac{(-1)^k e^{-1.5140667685568842\,k}}{k}\right)^2\right)\right) \Big/ \left(\sum_{k=0}^{\infty} \frac{(8-n_0)^k\, \Gamma^{(k)}(1+n_0)}{k!}\right) \text{ for } ((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to 8)$$

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \left(1+893\,971.3161384143\left(\log(z_0) + \left\lfloor \frac{\arg(5.5451774444790000 - z_0)}{2\pi} \right\rfloor \left(\log\left(\frac{1}{z_0}\right) + \log(z_0)\right) - \sum_{k=1}^{\infty} \frac{(-1)^k (5.5451774444790000 - z_0)^k z_0^{-k}}{k}\right)^2\right) \Big/ \left(\sum_{k=0}^{\infty} \frac{(8-n_0)^k\, \Gamma^{(k)}(1+n_0)}{k!}\right) \text{ for } ((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to 8)$$

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

Integral representations:

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} = \frac{1}{\int_0^{\infty} e^{-t} t^8 \, dt} 893\,971.31613841 \left(1.11860412291480\times 10^{-6} + 1.00000000000000 \log^2(5.5451774444790000)\right)$$

•

$$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} =$$

$$\frac{1}{\int_0^1 \log^8\left(\frac{1}{t}\right) dt} 893\,971.31613841 \left(1.11860412291480 \times 10^{-6} + 1.00000000000000 \left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2\right)$$

- $$\frac{1+5.5451774444790000^8 \log^2(5.5451774444790000)}{(6+2)!} =$$

$$\frac{1}{\int_0^\infty e^{-t}\, t^8\, dt} 893\,971.31613841 \left(1.11860412291480 \times 10^{-6} + 1.00000000000000 \left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2\right)$$

(-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))

Where 11, 29, 47 and 123 are Lucas numbers

Input interpretation:

$$(-123-47+11)+29 \times \frac{1}{(6+2)!} \left(1+5.545177444479^8 \log^2(5.545177444479)\right)$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

1727.59967948...

1727.59967…

This result is very near to the mass of candidate glueball $f_0(1710)$ 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

Alternative representations:

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} = -159+\frac{29\left(1+5.5451774444790000^8 \left(\log(a)\log_a(5.5451774444790000)\right)^2\right)}{\Gamma(9)}$$

•

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} = -159+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{7!!\times 8!!}$$

•

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} = -159+\frac{29\left(1+5.5451774444790000^8 \log_e^2(5.5451774444790000)\right)}{(1)_8}$$

$\Gamma(x)$ is the gamma function

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

$n!!$ is the double factorial function

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

•

Series representations:

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} = -159+\frac{29.0000000000000+2.59251681680140\times 10^7 \log^2(5.5451774444790000)}{\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}}$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 8)$

•

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} =$$

$$-\left(\left(159.0000000000000\left(-0.1823899371069182-163\,051.3721258743 \log^2(4.5451774444790000)+326\,102.744251749 \log(4.5451774444790000)\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842 k}}{k}-163\,051.3721258743\left(\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842 k}}{k}\right)^2+1.000000000000000\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)\Bigg/\left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right) \text{ for } ((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to 8)$$

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} =$$

$$-159+\left(29\left(1+893\,971.3161384143\left(\log(z_0)+\left\lfloor\frac{\arg(5.5451774444790000-z_0)}{2\pi}\right\rfloor\left(\log\left(\frac{1}{z_0}\right)+\log(z_0)\right)-\sum_{k=1}^{\infty}\frac{(-1)^k (5.5451774444790000-z_0)^k z_0^{-k}}{k}\right)^2\right)\right)\Bigg/\left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right) \text{ for } ((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to 8)$$

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

Integral representations:

$$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} =$$

$$-\frac{1}{\int_0^{\infty} e^{-t}\, t^8\, dt} 159.000000000000\left(-0.182389937106918+1.00000000000000\int_0^{\infty} e^{-t}\, t^8\, dt-163\,051.372125874 \log^2(5.5451774444790000)\right)$$

- $$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} = -\frac{1}{\int_0^1 \log^8\left(\frac{1}{t}\right) dt} 159.000000000000 \left(-0.182389937106918 - 163051.372125874 \left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2 + 1.00000000000000 \int_0^1 \log^8\left(\frac{1}{t}\right) dt\right)$$

- $$(-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!} = -\frac{1}{\int_0^\infty e^{-t}\, t^8\, dt} 159.000000000000 \left(-0.182389937106918 - 163051.372125874 \left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2 + 1.00000000000000 \int_0^\infty e^{-t}\, t^8\, dt\right)$$

(((((-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))))))^1/15

Input interpretation:

$$\sqrt[15]{(-123-47+11)+29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8 \log^2(5.545177444479)\right)}$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

- More digits

1.643726439906...

1.643726439…. ≈ ζ(2) = $\frac{\pi^2}{6} = 1.644934$ ...

29/10^3 +(((((-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))))))^1/15

Input interpretation:

$$\frac{29}{10^3} + \sqrt[15]{(-123-47+11)+29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8\log^2(5.545177444479)\right)}$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

1.672726439906...

1.672726439…. result very near to the proton mass

Alternative representations:

$$\frac{29}{10^3} + \sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}} = \frac{29}{10^3} + \sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\left(\log(a)\log_a(5.5451774444790000)\right)^2\right)}{\Gamma(9)}}$$

$$\frac{29}{10^3} + \sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}} = \frac{29}{10^3} + \sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{7!!\times 8!!}}$$

$$\frac{29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$=\frac{29}{10^3}+\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log_e^2(5.5451774444790000)\right)}{(1)_8}}$$

$\Gamma(x)$ is the gamma function

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

$n!!$ is the double factorial function

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

-

Series representations:

$$\frac{29}{10^3}+\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)=$$
$$\frac{29}{1000}+\left(-159+\left(29.0000000000000+2.59251681680140\times10^7\log^2(5.5451774444790000)\right)\Big/\left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)^\wedge(1/15)\quad\text{for }((n_0\notin\mathbb{Z}\text{ or }n_0\geq 0)\text{ and }n_0\to 8)$$

-

$$\frac{29}{10^3} + \left((-123 - 47 + 11) + \frac{29\,(1 + 5.5451774444790000^8 \log^2(5.5451774444790000))}{(6+2)!}\right)\text{^}(1/15) = \frac{1}{1000}\left(29 + 1000\left(-159 + \left(29\left(1 + 893\,971.3161384143\left(\log(4.5451774444790000) - \sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842\,k}}{k}\right)^2\right)\right) \Big/ \left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)\text{^}(1/15)\right)$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 8)$

-

$$\frac{29}{10^3} + \left((-123 - 47 + 11) + \frac{29\,(1 + 5.5451774444790000^8 \log^2(5.5451774444790000))}{(6+2)!}\right)\text{^}(1/15) = \frac{1}{1000}\left(29 + 1000\left(-159 + \left(29\left(1 + 893\,971.3161384143\left(2\,i\,\pi\left\lfloor\frac{\arg(5.5451774444790000 - x)}{2\pi}\right\rfloor + \log(x) - \sum_{k=1}^{\infty}\frac{(-1)^k (5.5451774444790000 - x)^k x^{-k}}{k}\right)^2\right)\right) \Big/ \left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)\text{^}(1/15)\right)$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $x < 0$ and $n_0 \to 8)$

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

- **Integral representations:**

$$\frac{29}{10^3} + \sqrt[15]{(-123-47+11) + \frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$= \frac{29}{1000} + \left(-159 + \frac{1}{\int_0^\infty e^{-t}\, t^8\, dt}\left(29.0000000000000 + 2.59251681680140\times 10^7 \log^2(5.5451774444790000)\right)\right) ^\wedge (1/15)$$

- $$\frac{29}{10^3} + \sqrt[15]{(-123-47+11) + \frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$= \frac{29 + 1000\sqrt[15]{-159 + \frac{29.0000000000000+2.59251681680140\times 10^7\left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2}{\int_0^1 \log^8\left(\frac{1}{t}\right) dt}}}{1000}$$

- $$\frac{29}{10^3} + \sqrt[15]{(-123-47+11) + \frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$= \frac{29 + 1000\sqrt[15]{-159 + \frac{29.0000000000000+2.59251681680140\times 10^7\left(\int_1^{5.5451774444790000} \frac{1}{t}\, dt\right)^2}{\int_0^\infty e^{-t}\, t^8\, dt}}}{1000}$$

-(47+7-29)/10^3 +(((((-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))))))^1/15

Input interpretation:

$$-\frac{47+7-29}{10^3} + \sqrt[15]{(-123-47+11) + 29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8 \log^2(5.545177444479)\right)}$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

1.618726439906...

1.618726439…

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

Alternative representations:

$$-\frac{47+7-29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}} = -\frac{25}{10^3}+\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\left(\log(a)\log_a(5.5451774444790000)\right)^2\right)}{\Gamma(9)}}$$

-

$$-\frac{47+7-29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}} = -\frac{25}{10^3}+\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{7!!\times 8!!}}$$

-

$$-\frac{47+7-29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}$$

$$=-\frac{25}{10^3}+\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log_e^2(5.5451774444790000)\right)}{(1)_8}}$$

$\Gamma(x)$ is the gamma function

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

$n!!$ is the double factorial function

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

-

Series representations:

$$-\frac{47+7-29}{10^3}+\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)\hat{}\,(1/15)=$$

$$-\frac{1}{40}+\left(-159+\left(29.0000000000000+2.59251681680140\times10^7\log^2(5.5451774444790000)\right)\Big/\left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)\hat{}\,(1/15)\quad\text{for } ((n_0\notin\mathbb{Z}\text{ or }n_0\geq0)\text{ and }n_0\to8)$$

-

$$-\frac{47+7-29}{10^3}+\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)=$$

$$\frac{1}{40}\left(-1+40\left(-159+\left(29\left(1+893\,971.3161384143\left(\log(4.5451774444790000)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-1.5140667685568842k}}{k}\right)^2\right)\right)\Bigg/\left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)^\wedge(1/15)\right)$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $n_0 \to 8)$

- $$-\frac{47+7-29}{10^3}+\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)=$$

$$\frac{1}{40}\left(-1+40\left(-159+\left(29\left(1+893\,971.3161384143\left(2i\pi\left\lfloor\frac{\arg(5.5451774444790000-x)}{2\pi}\right\rfloor+\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k(5.5451774444790000-x)^k x^{-k}}{k}\right)^2\right)\right)\Bigg/\left(\sum_{k=0}^{\infty}\frac{(8-n_0)^k\,\Gamma^{(k)}(1+n_0)}{k!}\right)\right)^\wedge(1/15)\right)$$

for $((n_0 \notin \mathbb{Z}$ or $n_0 \geq 0)$ and $x < 0$ and $n_0 \to 8)$

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

$\arg(z)$ is the complex argument

$\lfloor x \rfloor$ is the floor function

i is the imaginary unit

Integral representations:

$$-\frac{47+7-29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$=-\frac{1}{40}+\left(-159+\frac{1}{\int_0^\infty e^{-t}\,t^8\,dt}(29.0000000000000+2.59251681680140\times 10^7\log^2(5.5451774444790000))\right)\wedge(1/15)$$

- $$-\frac{47+7-29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$=\frac{1}{40}\left(-1+40\left(-159+\frac{1}{\int_0^1\log^8\left(\frac{1}{t}\right)dt}\left(29.0000000000000+2.59251681680140\times 10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2\right)\right)\wedge(1/15)\right)$$

- $$-\frac{47+7-29}{10^3}+\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}$$
$$=\frac{1}{40}\left(-1+40\left(-159+\frac{1}{\int_0^\infty e^{-t}\,t^8\,dt}\left(29.0000000000000+2.59251681680140\times 10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2\right)\right)\wedge(1/15)\right)$$

2sqrt((((6*(((((-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))))))^1/15)))))

Input interpretation:

$$2\sqrt{\left(6\left((-123-47+11)+29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8\log^2(5.545177444479)\right)\right)\wedge(1/15)\right)}$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

6.280878486146...

6.280878486146…. = 2πr = C

Alternative representations:

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^{\wedge}(1/15)\right)}=2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(1)_8}}}$$

-

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^{\wedge}(1/15)\right)}=2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{7!!\times 8!!}}}$$

-

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)\right)} = 2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log_e^2(5.5451774444790000)\right)}{(1)_8}}}$$

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

$n!!$ is the double factorial function

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

-

Series representations:

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)\right)} = 2\exp\left(i\pi\left\lfloor\frac{1}{2\pi}\arg\left(-x+8.4122284578998498\left(-\frac{1}{8!}\left(-0.1823899371069182+8!-163\,051.3721258743\log^2(5.5451774444790000)\right)\right)^\wedge(1/15)\right)\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left(-x+8.4122284578998498\left(-\frac{1}{8!}\left(-0.1823899371069182+8!-163\,051.3721258743\log^2(5.5451774444790000)\right)\right)^\wedge(1/15)\right)^k\left(-\frac{1}{2}\right)_k \quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

-

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\,(1+5.5451774444790000^8\log^2(5.5451774444790000))}{(6+2)!}\right)^{\wedge}(1/15)\right)} = 2$$

$$\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(8.4122284578998498\sqrt[15]{-\frac{-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000)}{8!}}-z_0\right)/(2\pi)\right\rfloor}$$

$$z_0^{1/2\left(1+\left\lfloor\arg\left(8.4122284578998498\sqrt[15]{-\frac{-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000)}{8!}}-z_0\right)/(2\pi)\right\rfloor\right)}$$

$$\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k\left(-\frac{1}{2}\right)_k\left(8.4122284578998498\left(-\frac{1}{8!}(-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000))\right)^{\wedge}(1/15)-z_0\right)^k z_0^{-k}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

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

Integral representations:

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\,(1+5.5451774444790000^8\log^2(5.5451774444790000))}{(6+2)!}\right)^{\wedge}(1/15)\right)} = 2\sqrt{\left(6\left(-159+\frac{1}{\int_0^{\infty}e^{-t}\,t^8\,dt}(29.0000000000000+2.59251681680140\times10^7\log^2(5.5451774444790000))\right)^{\wedge}(1/15)\right)}$$

•

$$2\sqrt{\left(6\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)\right)} = 2\sqrt{\left(6\left(-159+\frac{1}{\int_0^1 \log^8\left(\frac{1}{t}\right)dt}\left(29.0000000000000+2.59251681680140\times10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2\right)\right)^\wedge(1/15)\right)}$$

- $$2\sqrt{\left(6\left((-123-47+11)+\frac{29\left(1+5.5451774444790000^8 \log^2(5.5451774444790000)\right)}{(6+2)!}\right)^\wedge(1/15)\right)} = 2\sqrt{\left(6\left(-159+\frac{1}{\int_0^\infty e^{-t}\,t^8\,dt}\left(29.0000000000000+2.59251681680140\times10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2\right)\right)^\wedge(1/15)\right)}$$

We have:

1/(2Pi) * 2sqrt((((6*(((((-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))))))^1/15)))))

Input interpretation:

$$\frac{1}{2\pi}\times 2\sqrt{\left(6\left((-123-47+11)+29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8 \log^2(5.545177444479)\right)\right)^\wedge(1/15)\right)}$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

0.9996328580297...

0.9996328580297…

Alternative representations:

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi}=\frac{2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{(1)_{8}}}}}{2\pi}$$

•

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi}=\frac{2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{7!!\times 8!!}}}}{2\pi}$$

•

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi}=\frac{2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^{8}\log_{e}^{2}(5.5451774444790000)\right)}{(1)_{8}}}}}{2\pi}$$

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

$n!!$ is the double factorial function

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

•

Series representations:

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi} =$$

$$\frac{1}{\pi}\exp\left(i\pi\left\lfloor\frac{1}{2\pi}\arg\left(-x+8.4122284578998498\left(-\frac{1}{8!}(-0.1823899371069182+8!-163\,051.3721258743\log^2(5.5451774444790000))\right)\wedge(1/15)\right)\right\rfloor\right)\sqrt{x}$$

$$\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k x^{-k}\left(-x+8.4122284578998498\left(-\frac{1}{8!}(-0.1823899371069182+8!-163\,051.3721258743\log^2(5.5451774444790000))\right)\wedge(1/15)\right)^k\left(-\frac{1}{2}\right)_k \quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

•

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi} =$$

$$\frac{1}{\pi}\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(6\sqrt[15]{-159+\frac{29\left(1+893971.3161384143\log^2(5.5451774444790000)\right)}{8!}}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(1+\left\lfloor\arg\left(6\sqrt[15]{-159+\frac{29\left(1+893971.3161384143\log^2(5.5451774444790000)\right)}{8!}}-z_0\right)/(2\pi)\right\rfloor\right)}$$

$$\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(6\sqrt[15]{-159+\frac{29\left(1+893971.3161384143\log^2(5.5451774444790000)\right)}{8!}}-z_0\right)^k z_0^{-k}}{k!}$$

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi} = \frac{1}{\pi}$$

$$\left(\frac{1}{z_0}\right)^{1/2\left\lfloor \arg\left(8.4122284578998498\sqrt[15]{-\frac{-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000)}{8!}}-z_0\right)/(2\pi)\right\rfloor}$$

$$z_0^{1/2\left(1+\left\lfloor \arg\left(8.4122284578998498\sqrt[15]{-\frac{-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000)}{8!}}-z_0\right)/(2\pi)\right\rfloor\right)}$$

$$\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k\left(-\frac{1}{2}\right)_k\left(8.4122284578998498\left(-\frac{1}{8!}(-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000))\right)\hat{}\,(1/15)-z_0\right)^k z_0^{-k}$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

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

Integral representations:

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi} = \frac{\sqrt{6\sqrt[15]{-159+\frac{29.0000000000000+2.59251681680140\times10^7\log^2(5.5451774444790000)}{\int_0^\infty e^{-t}t^8\,dt}}}}{\pi}$$

•

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi} = \frac{\sqrt{6\sqrt[15]{-159+\frac{29.0000000000000+2.59251681680140\times10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}{\int_0^1\log^8\left(\frac{1}{t}\right)dt}}}}{\pi}$$

-

$$\frac{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}}{2\pi} = \frac{\sqrt{6\sqrt[15]{-159+\frac{29.0000000000000+2.59251681680140\times10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}{\int_0^\infty e^{-t}\,t^8\,dt}}}}{\pi}$$

This result 0.9996328580297… is very near to the value of the following Rogers-Ramanujan continued fraction

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

And:

(2Pi) / (((((2sqrt((((6*(((((-123-47+11)+29 * 1/(6+2)! * ((1+5.545177444479^8 * ln^2(5.545177444479))))))^1/15))))))))))

Input interpretation:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8\log^2(5.545177444479)\right)}}}$$

$n!$ is the factorial function

$\log(x)$ is the natural logarithm

Result:

1.000367276813...

1.000367276813 = radius

Alternative representations:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} = \frac{2\pi}{2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(1)_8}}}}$$

- $$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} = \frac{2\pi}{2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{7!!\times 8!!}}}}$$

- $$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} = \frac{2\pi}{2\sqrt{6\sqrt[15]{-159+\frac{29\left(1+5.5451774444790000^8\log_e^2(5.5451774444790000)\right)}{(1)_8}}}}$$

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

$n!!$ is the double factorial function

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

- **Series representations:**

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{(6+2)!}}}} =$$

$$\pi \Big/ \left(\exp\left(i\pi\left\lfloor\frac{1}{2\pi}\arg\left(-x+8.4122284578998498\left(-\frac{1}{8!}(-0.1823899371069182+8!-163\,051.3721258743\log^{2}(5.5451774444790000))\right)\hat{}\,(1/15)\right)\right\rfloor\right)\right.$$
$$\left.\sqrt{x}\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^{k}x^{-k}\left(-x+8.4122284578998498\left(-\frac{1}{8!}(-0.1823899371069182+8!-163\,051.3721258743\log^{2}(5.5451774444790000))\right)\hat{}\,(1/15)\right)^{k}\left(-\frac{1}{2}\right)_{k}\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

-

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^{8}\log^{2}(5.5451774444790000)\right)}{(6+2)!}}}} =$$

$$\left(\pi\left(\frac{1}{z_0}\right)^{-1/2\left\lfloor\arg\left(6\sqrt[15]{-159+\frac{29(1+893\,971.3161384143\log^{2}(5.5451774444790000))}{8!}}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2\left(-1-\left\lfloor\arg\left(6\sqrt[15]{-159+\frac{29(1+893\,971.3161384143\log^{2}(5.5451774444790000))}{8!}}-z_0\right)/(2\pi)\right\rfloor\right)}\right)\Big/$$
$$\left(\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^{k}\left(-\frac{1}{2}\right)_{k}\left(6\left(-159+\frac{29(1+893\,971.3161384143\log^{2}(5.5451774444790000))}{8!}\right)\hat{}\,(1/15)-z_0\right)^{k} z_0^{-k}\right)$$

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} = \Bigg(\pi$$

$$\left(\frac{1}{z_0}\right)^{-1/2\left\lfloor \arg\left(8.4122284578998498\sqrt[15]{-\frac{-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000)}{8!}}-z_0\right)/(2\pi)\right\rfloor}$$

$$z_0^{1/2\left(-1-\left\lfloor \arg\left(8.4122284578998498\sqrt[15]{-\frac{-0.1823899371069182+8!-163051.3721258743\log^2(5.5451774444790000)}{8!}}-z_0\right)/(2\pi)\right\rfloor\right)}$$

$$\Bigg)\Bigg/\left(\sum_{k=0}^{\infty}\frac{1}{k!}(-1)^k\left(-\frac{1}{2}\right)_k\left(8.4122284578998498\right.\right.$$

$$\left(-\frac{1}{8!}(-0.1823899371069182+8!-163\,051.3721258743\right.$$

$$\left.\left.\left.\log^2(5.5451774444790000))\right)\hat{}\,(1/15)-z_0\right)^k z_0^{-k}\right)$$

$\arg(z)$ is the complex argument

$\lfloor x\rfloor$ is the floor function

i is the imaginary unit

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

Integral representations:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} = \frac{\pi}{\sqrt{6\sqrt[15]{-159+\frac{29.0000000000000+2.59251681680140\times10^7\log^2(5.5451774444790000)}{\int_0^{\infty}e^{-t}t^8\,dt}}}}$$

•

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} =$$

$$\frac{\pi}{\sqrt{6\sqrt[15]{-159+\frac{29.0000000000000+2.59251681680140\times10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}{\int_0^1\log^8\left(\frac{1}{t}\right)dt}}}}$$

•

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+\frac{29\left(1+5.5451774444790000^8\log^2(5.5451774444790000)\right)}{(6+2)!}}}} =$$

$$\frac{\pi}{\sqrt{6\sqrt[15]{-159+\frac{29.0000000000000+2.59251681680140\times10^7\left(\int_1^{5.5451774444790000}\frac{1}{t}\,dt\right)^2}{\int_0^\infty e^{-t}\,t^8\,dt}}}}$$

We note that the result 1.000367276813, that is a radius, is very near to

$$\zeta(12) = 1 + \frac{1}{2^{12}} + \frac{1}{3^{12}} + \cdots = \frac{691\pi^{12}}{638512875} = 1.000246\ldots$$

Thence, we have the following mathematical connection with the Dirichlet conditions concerning the D-branes:

$$\zeta(12) = 1 + \frac{1}{2^{12}} + \frac{1}{3^{12}} + \cdots = \frac{691\pi^{12}}{638512875} = 1.000246\ldots$$

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

$$\int_0^\pi d\sigma \partial_\sigma X'^{25} = i \int_0^\pi d\sigma \partial_\tau X^{25} = 2\pi\alpha' p^{25} = \frac{2\pi\alpha' n}{R} = 2\pi n R'.$$

Example:

$$\frac{2\pi}{2\sqrt{6\sqrt[15]{(-123-47+11)+29\times\frac{1}{(6+2)!}\left(1+5.545177444479^8\log^2(5.545177444479)\right)}}}$$

$= 1.000367276813\ldots \Rightarrow$

$$\Rightarrow \zeta(12) = 1 + \frac{1}{2^{12}} + \frac{1}{3^{12}} + \cdots = \frac{691\pi^{12}}{638512875} = 1.000246\ldots$$

$1/\zeta(12) = 1 / 1.000246... = 0,999754060501 \Rightarrow$

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

$\Rightarrow$

$$\Rightarrow \int_0^\pi d\sigma \partial_\sigma X'^{25} = i \int_0^\pi d\sigma \partial_\tau X^{25} = 2\pi\alpha' p^{25} = \frac{2\pi\alpha' n}{R} = 2\pi n R'.$$

References

Berndt, B. et al. "*The Rogers–Ramanujan Continued Fraction*",

http://www.math.uiuc.edu/~berndt/articles/rrcf.pdf

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