On the possible mathematical connections between some equations of the 'Black Hole Entropy and Soft Hair', Black Hole physics, Ramanujan's Class Invariants and Mock Theta Functions

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Abstract

In the present research thesis, we have obtained various and interesting mathematical connections between some equations of the 'Black Hole Entropy and Soft Hair', the fundamental last paper of S.W. Hawking, mathematics and physics of Black Hole, Ramanujan's Class Invariants and Mock Theta Functions

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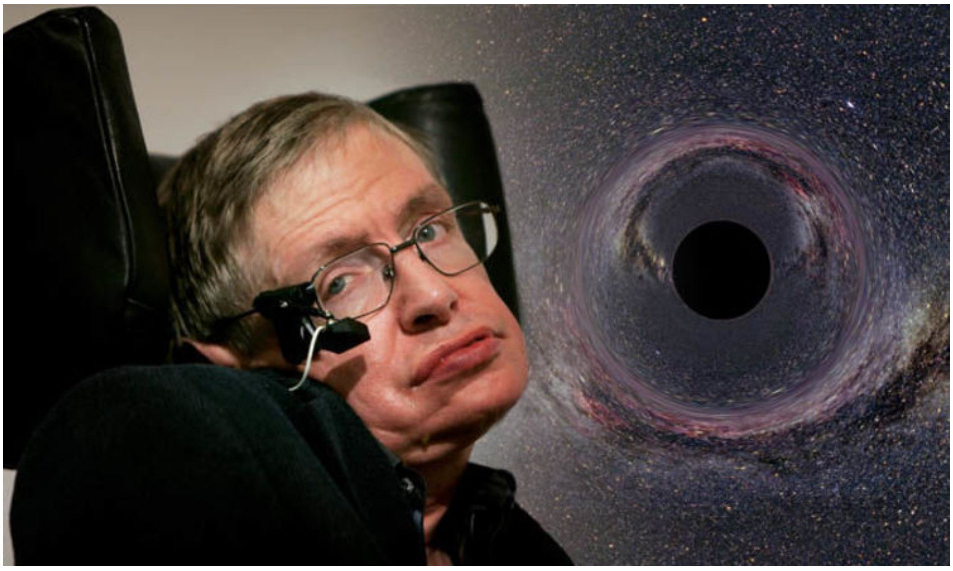
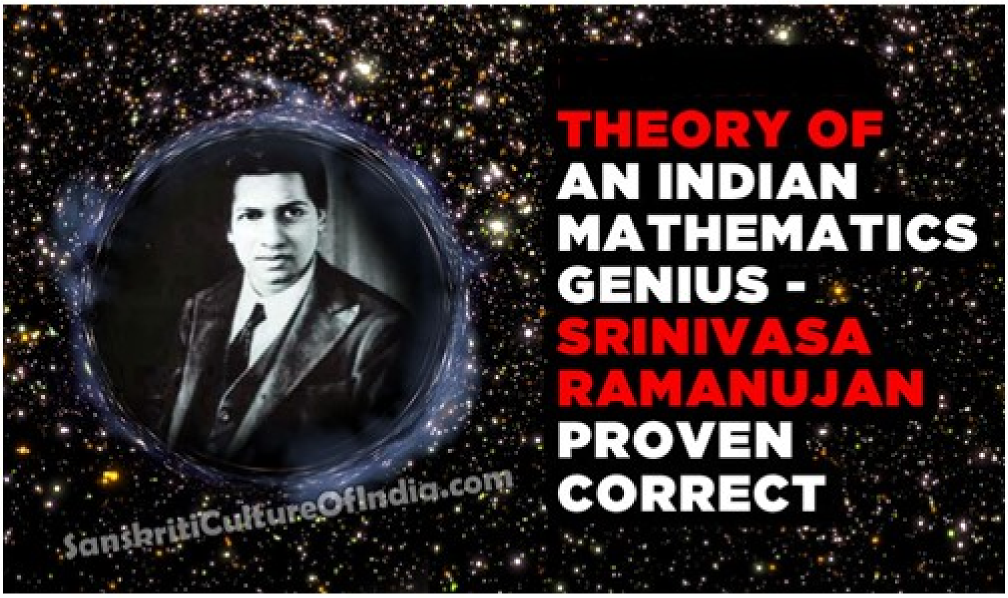


https://www.express.co.uk/news/science/1030107/Stephen-Hawking-final-theory-black-holes-science-paper



https://www.sanskritimagazine.com/india/deathbed-theory-of-an-indian-mathematical-genius-proven-correct/

From:

Black Hole Entropy and Soft Hair

Sasha Haco†, Stephen W. Hawking, Malcolm J. Perry† and Andrew Strominger†

https://arxiv.org/abs/1810.01847v4

Throughout this paper we use units such that $c = \hbar = k = G = 1$.

2 Hidden conformal symmetry

Kerr black holes with generic mass M and spin $J \leq M^2$ exhibit a hidden conformal symmetry which acts on low-lying soft modes [52]. The symmetry emerges, not in a near-horizon region of *spacetime*, but in the near-horizon region of *phase space* defined by

$$\omega(r - r_+) \ll 1, \tag{2.1}$$

where ω is the energy of the soft mode, r is the Boyer-Lindquist radial coordinate and $r_+ = M + \sqrt{M^2 - a^2}$, with $a = \frac{J}{M}$, is the location of the outer horizon. This simply states that the soft mode wavelength is large compared to the black hole. One way to see the

Here the left and right temperatures are defined by

$$T_L = \frac{r_+ + r_-}{4\pi a}, \quad T_R = \frac{r_+ - r_-}{4\pi a}, \tag{2.4}$$

with $r_- = M - \sqrt{M^2 - a^2}$ and the left and right soft mode energies are

$$\omega_L = \frac{2M^2}{a}\omega, \quad \omega_R = \frac{2M^2}{a}\omega - m, \tag{2.5}$$

7 The area law

Using $c_L = c_R = 12J$ as given above, the temperature formulae (2.4) and the Cardy formula

$$S_{Cardy} = \frac{\pi^2}{3}(c_L T_L + c_R T_R), \tag{7.1}$$

yields the Hawking-Bekenstein area-entropy law for generic Kerr

$$S_{BH} = S_{Cardy} = 2\pi M r_+ = \frac{Area}{4}. \tag{7.2}$$

We have developed the eq (7.1) with the data of SMBH87, concerning the mass and the spin.

We have obtained the following expression:

For a = J / M, where J = 0,9 and M = 13,12806 * 10^{39} that are J and M of SMBH87, we obtain:

(0.9 / 13.12806*10^39)

Input interpretation:

$$\frac{0.9}{13.12806 \times 10^{39}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  6.8555445359024867345213230286881687012399394883935631... × 10^{-41}

Open code

Now, we have:

a) (Pi^2)/3 * (((((((((12*0.9*2*13.12806*10^39)/((4Pi*((0.9/13.12806*10^39)))))))) + (((((12*0.9*2*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/(((4Pi*((0.9/13.12806*10^39))))))))

Input interpretation:

$$\frac{\pi^2}{3}\left(\frac{12\times 0.9\times 2\times 13.12806\times 10^{39}}{4\,\pi\times\frac{0.9}{13.12806\times 10^{39}}}+\frac{12\times 0.9\times 2\sqrt{(13.12806\times 10^{39})^2-\left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}}{4\,\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$2.1657631992502831885592351242853104951226174156593896\ldots\times 10^{81}$

Input interpretation:

Or:

b) (Pi^2)/3 * ((((((((((6*0.9*13.12806*10^39)/((Pi*((0.9/13.12806*10^39)))))))) + (((((6*0.9*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/(((Pi*((0.9/13.12806*10^39))))))))

Input interpretation:

$$\frac{\pi^2}{3}\left(\frac{6\times 0.9\times 13.12806\times 10^{39}}{\pi\times\frac{0.9}{13.12806\times 10^{39}}}+\frac{6\times 0.9\sqrt{(13.12806\times 10^{39})^2-\left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}}{\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$2.1657631992502831885592351242853104951226174156593896\ldots\times 10^{81}$

Or:

c) 2(Pi) * ((((((((((0.9*13.12806*10^39)/((0.9/13.12806*10^39)))))))) + (((((0.9*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/((0.9/13.12806*10^39))))))))

Input interpretation:

$$2\pi\left(\frac{0.9\times 13.12806\times 10^{39}}{\frac{0.9}{13.12806\times 10^{39}}}+\frac{0.9\sqrt{(13.12806\times 10^{39})^2-\left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}}{\frac{0.9}{13.12806\times 10^{39}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$2.1657631992502831885592351242853104951226174156593896\ldots\times 10^{81}$

We note that the above expression is a length of a circle with r equal to

((((((((((0.9*13.12806*10^39)/((0.9/13.12806*10^39)))))))) + (((((0.9*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/((0.9/13.12806*10^39))))))))

Indeed, we have:

((((((((((0.9*13.12806*10^39)/((0.9/13.12806*10^39)))))))) + (((((0.9*sqrt(((13.12805*10^39)^2-((0.9/13.12806*10^39))^2))))))/((0.9/13.12806*10^39))))))))

Input interpretation:

$$\frac{0.9\times 13.12806\times 10^{39}}{\frac{0.9}{13.12806\times 10^{39}}}+\frac{0.9\sqrt{(13.12805\times 10^{39})^2-\left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}}{\frac{0.9}{13.12806\times 10^{39}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$3.446917874466000000000000000000000000000000000000000\ldots\times 10^{80}$

((3.446917874466000000000000000000000000000000000000 × 10^80))^1/25

Input interpretation:

$$\sqrt[25]{3.446917874466000000000000000000000000000000000000\times 10^{80}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1665.3182346318267472038120880272781915027879011 28...

$1.665318234631826747203812088027278191502787901128 * 10^3$

Result:

1665.318234631826747203812088027278191502787901128

Open code

Now, we have that, calculating the integral of the above expression a), we obtain:

integrate (Pi^2)/3 * ((((((((((12*0.9*2*13.12806*10^39)/((4Pi*((0.9/13.12806*10^39)))))))) + (((((12*0.9*2*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/(((4Pi*((0.9/13.12806*10^39))))))))x

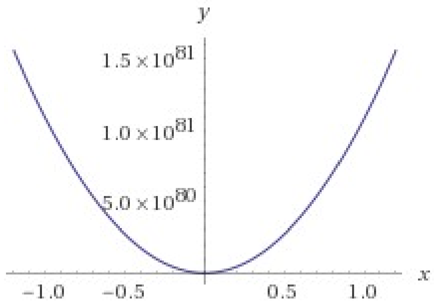
Indefinite integral:

$$\int \frac{1}{3}\pi^2 \left(\left(\left(\frac{12\times 0.9\times 2\; 13.12806\times 10^{39}}{\frac{4\pi\, 0.9}{13.12806\times 10^{39}}} + \frac{12\times 0.9\times 2\sqrt{(13.12806\times 10^{39})^2 - \left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}}{\frac{4\pi\, 0.9}{13.12806\times 10^{39}}}\right) x\right)\right) dx = 1.08288\times 10^{81}\, x^2 + \text{constant}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Plot of the integral:



(x from −1.2 to 1.2)

Open code

Alternate form assuming x is real:

$1.08288\times 10^{81}\, x^2 + 0 + \text{constant}$

Open code

Or, from c):

integrate 2(Pi) * (((((((((0.9*13.12806*10^39)/((0.9/13.12806*10^39)))))))) + (((((0.9*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/((0.9/13.12806*10^39)))))))))x

Indefinite integral:

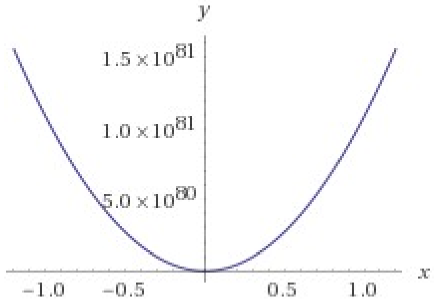
$$\int 2\pi \left(\frac{0.9\ 13.12806 \times 10^{39}}{\frac{0.9}{13.12806 \times 10^{39}}} + \frac{0.9 \sqrt{(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2}}{\frac{0.9}{13.12806 \times 10^{39}}} \right) x\, dx =$$

$1.08288 \times 10^{81} x^2$ + constant

Open code

Enlarge Data Customize A Plaintext Interactive

Plot of the integral:



(x from −1.2 to 1.2)

Open code

Alternate form assuming x is real:

$1.08288 \times 10^{81} x^2 + 0$ + constant

Open code

This result, for x = 1, is equal to:

Scientific notation:

1.08288×10^{81}

Open

Continuing the integrations, we have:

integrate (1.08288×10^81)x

Indefinite integral:

$\int 1.08288 \times 10^{81}\, x\, dx = 5.4144 \times 10^{80} x^2$ + constant

Open code

integrate (5.4144×10^80)x

Indefinite integral:

$\int 5.4144 \times 10^{80}\, x\, dx = 2.7072 \times 10^{80} x^2$ + constant

Open code

integrate (2.7072×10^80) x

Indefinite integral:

$$\int 2.7072\times 10^{80}\, x\, dx = 1.3536\times 10^{80}\, x^2 + \text{constant}$$

Open code

integrate (1.3536×10^80) x

Indefinite integral:

$$\int 1.3536\times 10^{80}\, x\, dx = 6.768\times 10^{79}\, x^2 + \text{constant}$$

and so on.....

(Note that, for example, 0.06768 * 16 = 1,08288; 0.13536 * 8 = 1,08288;

0.27072 * 4 = 1,08288; 0.54144 * 2 = 1,08288)

Continuing to carry out successive integrals of the values gradually obtained, the results will always be numbers with very high exponents, which decrease very slowly and are all sub-multiples of the initial result and of 1.08288 .... All this is strictly connected to that physical emission process of particles with a black hole called Hawking Radiation. Moreover, when the black hole emits Hawking radiation, the entropy must decrease! But, as you can already see from the results of the calculations, it will do it in extremely long times (it is calculated that the time that a black hole of a solar mass takes to evaporate is equal to 10^{67} years).

An identical result, we can to obtain, also as follows:

from eqs. (2.4) and (7.1), after some calculation, we obtain:

$$\frac{2\pi}{a}\left(MJ + \sqrt{M^2 - a^2}\right),$$

where $\left(MJ + \sqrt{M^2 - a^2}\right)$, is:

(13.12806*10^39 * 0.9) + sqrt((((13.12806*10^39)^2 - (0.9 / 13.12806*10^39)^2)))

Input interpretation:

$$13.12806\times 10^{39}\times 0.9 + \sqrt{(13.12806\times 10^{39})^2 - \left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.49433... \times 10^{40}$

Multiplying for $\frac{2\pi}{a}$, we obtain the final result of

$$\frac{2\pi}{a}\left(MJ + \sqrt{M^2 - a^2}\right),$$

2Pi/(6.8555445359024867345213230286881687012399394883935631 × 10^-41) * (13.12806*10^39 * 0.9) + sqrt((((13.12806*10^39)^2 - (0.9 / 13.12806*10^39)^2)))

Input interpretation:

$$2 \times \frac{\pi}{6.8555445359024867345213230286881687012399394883935631 \times 10^{-41}} \left(13.12806 \times 10^{39} \times 0.9\right) + \sqrt{\left(13.12806 \times 10^{39}\right)^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.08288... \times 10^{81}$

Result:

- Fewer digits
- More digits

$1.0828815996251415942796175621426552475613218358896948... \times 10^{81}$

$1.082881599625141594279617562142655247561321835 88 \times 10^{81}$

This result is identical to that obtained previously calculating the integral.

Now, we have:

((1.0828815996251415942796175621426552475613218358 8 × 10^81))^6

Input interpretation:

$\left(1.08288159962514159427961756214265524756132183588 \times 10^{81}\right)^6$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$1.6124484730802993948978632349227935843137931968 6 \times 10^{486}$

$1.61244847308029939489786323492279358431379319686 \times 10^{486}$

Note that we have from the result of Cardy formula without exponent, the following expressions:

(1.0828815996251415942796175621426552475613218358896948)^6

Input interpretation:

$1.08288159962514159427961756214265524756132183588^6$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.61244847308029939489786323492279358431379319686491739769 6...

1.612448473080299394897863234922793584313793196864917397696

Continued fraction:

- Linear form
-

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{9+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\frac{\log\left(\frac{13137257}{10779}\right)}{\log(82)} \approx 1.6124484730802994381 6$

$e^{3-31/e-35e+25/\pi+11\pi}\, \pi^{14+18e} \sin^9(e\pi)\cos^{18}(e\pi) \approx 1.612448473080299404 47$

$\frac{1169706941\pi}{2278983046} \approx 1.6124484730802993949 8927$

That is:

$1.6124484730802993948978632349227935843137931968649173976 \times 10^{81}$

Note that, from the following mean of 7th and 5th exponentiations, we obtain:

1/2 * (((((1.082881599625)^7 + (1.082881599625)^5))))

Input interpretation:

$\frac{1}{2}\left(1.082881599625^7 + 1.082881599625^5\right)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.617562831071441789804763989413458288414723274020485801164...

This result is a very good approximation to the value of golden ratio

Then, we have that:

(1.6124484730802993948978632349227935843137931968649173976 96)^1/6

Input interpretation:

$\sqrt[6]{1.612448473080299394897863234922793584313793196864917397696}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.08288159962514159427961756214265524756132183587999999999...

All 6th roots of 1.612448473080299394897863234922793584313793196864917397696:

- More roots
- More digits
- Show trigonometric form

$1.082881599625141594279617562142655247561321835879999999999 e^0$

≈ 1.0829 (real, principal root)

Open code

Enlarge Data Customize A Plaintext Interactive

$1.082881599625141594279617562142655247561321835879999999999 e^{(i\pi)/3}$

$\approx 0.54144 + 0.93780 i$

Open code

$1.082881599625141594279617562142655247561321835879999999999 e^{(2i\pi)/3}$

$\approx -0.54144 + 0.93780 i$

Open code

$1.082881599625141594279617562142655247561321835879999999999\, e^{i\pi}$

≈ -1.0829 (real root)

Open code

$1.082881599625141594279617562142655247561321835879999999999\, e^{-(2 i \pi)/3}$

$\approx -0.54144 - 0.93780\, i$

We note that:

1.082881599625141594279617562142655247561321835879999999999

Input interpretation:

1.082881599625141594279617562142655247561321835879999999999

Open code

Continued fraction:

- Linear form

$$1+\cfrac{1}{12+\cfrac{1}{15+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{5+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{82649431\,\pi}{239777687} \approx 1.08288159962514159445780$$

$$\frac{16935061\,\pi^2}{154349610} \approx 1.0828815996251416 1623$$

$$\frac{174580\,\pi^2 - 921313}{235664\,\pi} \approx 1.08288159962514159 39826$$

From:

$1.0828815996251415942796175621426552475613218358799999999999\, e^{0}$

≈ 1.0829 (real, principal root)

Input interpretation:

1.0829

Open code

Continued fraction:

- Linear form

$$1+\cfrac{1}{12+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{16+\cfrac{1}{\cdots}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$-\frac{3}{b_4(2)} \approx 1.08202128$$

$$\frac{\pi^4}{90} \approx 1.08232323$$

$$\frac{13}{12} \approx 1.0833333$$

We have:

Input interpretation:

1.08232323×90

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

97.4090907

Where

Continued fraction:

- Linear form

$$97+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{9881+\cfrac{1}{5+\cfrac{1}{\cdots}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\pi^4 \approx 97.4090910340$

$36\,\zeta(2)^2 \approx 97.4090910340$

$98 - 5\,\mathcal{P}_c(\text{5D bond}) \approx 97.4089999$

We observe that, from this last result, we obtain:

97.4090910340 *1.0828815996251415942796175621426552475613218358 8^Pi

Input interpretation:

$97.4090910340 \times 1.08288159962514159427961756214265524756132183588^{\pi}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

125.094675636...

Series representations:

- More

$$97.40909103400000 \times 1.082881599625141594279617562142655247561321835880000^{\pi} = 97.40909103400000 \times 1.082881599625141594279617562142655247561321835880000^{4\sum_{k=0}^{\infty} (-1)^k/(1+2k)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$97.40909103400000 \times 1.082881599625141594279617562142655247561321835880000^{\pi} = 83.06872455692809\, e^{0.1592512714994482595113223721938209767472026449755 96 \times \sum_{k=1}^{\infty} 2^k/\binom{2k}{k}}$$

Open code

$$97.40909103400000 \times 1.082881599625141594279617562142655247561321835880000^{\pi} = 97.40909103400000 \times 1.08288159962514159427961756214265524756132183588000\dot{}0^{\sum_{k=0}^{\infty} \left(2^{-k}(-6+50k)\right)/\binom{3k}{k}}$$

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

Integral representations:

- More

$$97.40909103400000 \times 1.0828815996251415942796175621426552475613218358800000^{\pi} = 97.40909103400000\, e^{0.15925127149944825951132237219382097674720264497559 6 \int_0^{\infty} 1/(1+t^2)\, dt}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$97.40909103400000 \times 1.0828815996251415942796175621426552475613218358800000^{\pi} = 97.40909103400000\, e^{0.31850254299889651902264474438764195349440528995 1193 \int_0^1 \sqrt{1-t^2}\, dt}$$

Open code

$$97.40909103400000 \times 1.0828815996251415942796175621426552475613218358800000^{\pi} = 97.40909103400000\, e^{0.15925127149944825951132237219382097674720264497559 6 \int_0^{\infty} \sin(t)/t\, dt}$$

Open code

Or:

pi^4 *1.0829^Pi

Input interpretation:

$\pi^4 \times 1.0829^{\pi}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

125.1013535729926354455786502597054782033835729788897557110...

125.10135357299263544557865025970547820338357297888975

Series representations:

- More

$$\pi^4\, 1.0829^{\pi} = 256 \times 1.0829^{4 \sum_{k=0}^{\infty} (-1)^k/(1+2k)} \left(\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}\right)^4$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi^4\, 1.0829^{\pi} = 1.0829^{x+2 \sum_{k=1}^{\infty} \sin(k x)/k} \left(x + 2 \sum_{k=1}^{\infty} \frac{\sin(k x)}{k}\right)^4 \quad \text{for } (x \in \mathbb{R} \text{ and } x > 0)$$

Open code

$$\pi^4\, 1.0829^\pi = 1.0829^{\sum_{k=0}^{\infty}\left(2^{-k}(-6+50k)\right)/\binom{3k}{k}\left(\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}\right)^4}$$

Integral representations:

- More

$$\pi^4\, 1.0829^\pi = 16\, e^{0.159285 \int_0^\infty 1/(1+t^2)\,dt \left(\int_0^\infty \frac{1}{1+t^2}\,dt\right)^4}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi^4\, 1.0829^\pi = 16\, e^{0.159285 \int_0^\infty \sin(t)/t\,dt \left(\int_0^\infty \frac{\sin(t)}{t}\,dt\right)^4}$$

Open code

$$\pi^4\, 1.0829^\pi = 256\, e^{0.318571 \int_0^1 \sqrt{1-t^2}\,dt \left(\int_0^1 \sqrt{1-t^2}\,dt\right)^4}$$

Continued fraction:

- Linear form

$$125+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{20+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{449+\cfrac{1}{1+\cfrac{1}{11+\cfrac{1}{9+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{8+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$-e^{50-18/e-6e-53/\pi-11\pi}\,\pi^{20-e}\tan^{15}(e\pi)\sec^{14}(e\pi) \approx 125.10135357299263549 2346$$

$$\sqrt{-10679-7229e+13453\pi+5361\log(2)} \approx 125.1013535729926354436935$$

$$\frac{1}{55}\left(-99\,C - 335 + 138\,\pi + 689\,\pi^2 + 46\,\pi\log(2) - 8\,\pi\log(3)\right) \approx$$

125.10135357299263544455562990

- $\sec(x)$ is the secant function
- $\log(x)$ is the natural logarithm
- C is Catalan's constant

This results 125,0946 and 125,1013 are practically equals to the Higgs boson mass, that is 125.18 ± 0.16 GeV/c^2 that in energy is equal to 11,2662 * 10^{18}

We obtain from 11.2662 without exponent, the following interesting result:

(11.2662)^1/5

Input interpretation:

$$\sqrt[5]{11.2662}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.623138171930418428297253030579660681738707040868261370199...

1.623138171930418428297253030579660681738707040868261370199...

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{88+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{449\, e\, e! - 8544 - 1996\, e + 1228\, e^2}{69\, e} \approx 1.62313817193041843034 2$$

$$\frac{-2457\, \pi\, \pi! - 1337 + 3210\, \pi + 4785\, \pi^2}{96\, \pi} \approx 1.623138171930418428977 10$$

$$\frac{5\,202\,007\,529\, \pi}{10\,068\,513\,525} \approx 1.623138171930418428278961$$

Or, with the our results:

125,0946 * 9 * 10^{16} and 125,1013 * 9 * 10^{16}

11,258514

11,259117

(11.258514)^1/5

Input interpretation:

$\sqrt[5]{11.258514}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.622916644782496914075814568204967079975605753418804467974...

1.6229166447824969140758145682049670799756057534188044

(11.259117)^1/5

Input interpretation:

$\sqrt[5]{11.259117}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.622934028919901880787518687142137712847096507259306533880...

1.6229340289199018807875186871421377128470965072593065

Now, we note that:

1.6124484730802993948978632349227935843137931968649173976 96

1.6229166447824969140758145682049670799756057534188044

1.6229340289199018807875186871421377128470965072593065

The mean of above results is:

((((1.612448473080299394897863234922793584313793196864917397696+(1.6229166447824969140758145682049670799756057534188044+1.6229340289199018807875186871421377128470965072593065)/2))))/2

Input interpretation:

$$\frac{1}{2}\left(1.612448473080299394897863234922793584313793196864917397696 + \frac{1}{2}(1.6229166447824969140758145682049670799756057534188044 + 1.6229340289199018807875186871421377128470965072593065)\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$$1.6176869049657493961647649312981729903625721636019864238 48\ldots$$

Open code

1.617686904965749396164764931298172990362572163601986423848

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{21+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{16+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\pi \;\boxed{\text{root of } 3561\,x^3 + 491\,x^2 - 33\,089\,x + 16\,422 \text{ near } x = 0.514926} \approx 1.61768690496574939616 91719$$

$$\frac{3\,533\,716\,141\,\pi}{6\,862\,574\,355} \approx 1.61768690496574939618 3861$$

$$\frac{-2270\,e\,e! - 7665 + 7707\,e + 2278\,e^2}{870\,e} \approx 1.61768690496574939616 29540$$

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

Now, we have from the initial result:

(((90 * 1.0828815996251415942796175621426552475613218358896948))) *18 – 27

Input interpretation:

$(90 \times 1.0828815996251415942796175621426552475613218358896948) \times 18 - 27$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

1727.2681913927293827329804506711015010493413741413O5576

Open code

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

(((((((90 * 1.0828815996251415942796175621426552475613218358896948))) *18 - 27)))))^1/3

Input interpretation:

$\sqrt[3]{(90 \times 1.0828815996251415942796175621426552475613218358896948) \times 18 - 27}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

11.998305759401271268515373020771298000350981408462118...

This result is very near to the value of black hole entropy 12,1904

2 * (((((((90 * 1.0828815996251415942796175621426552475613218358896948))) *18 - 27)))))^1/3

Input interpretation:

$2\,((90 \times 1.0828815996251415942796175621426552475613218358896948) \times 18 - 27)$ ^ $(1/3)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

23.99661151880254253703074604154259600070196281692423 6...

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

(((((((90 * 1.0828815996251415942796175621426552475613218358896948))) *18 - 27)))))^1/15

Input interpretation:

$$\sqrt[15]{(90 \times 1.0828815996251415942796175621426552475613218358896948) \times 18 - 27}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.643705411710990628711851316292519289584326508929090 35...

1.64370541171099062871185131629251928958432650892909035

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{109+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{1}{114}\left(51 e^{\pi} + 249 \pi - 16 \log(\pi) + 30 \log(2 \pi) - 1435 \tan^{-1}(\pi)\right) \approx$$

1.64370541171099062848512

root of $9996 x^3 - 35\,111 x^2 + 35\,360 x - 7651$ near $x = 1.64371$ $\approx$

1.64370541171099062779817

$$\frac{3\,254\,794\,735 \pi}{6\,220\,846\,604} \approx 1.64370541171099062874221 1$$

And from the mean of 15th and 16th roots, we obtain:

1/2 * [((((((90 * 1.082881599))) *18 - 27)))))^1/16 + ((((90 * 1.082881599))) *18 - 27)))))^1/15]

Input interpretation:

$$\frac{1}{2}\left(\sqrt[16]{(90 \times 1.082881599) \times 18 - 27} + \sqrt[15]{(90 \times 1.082881599) \times 18 - 27}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.618571368306173594164561088465594261368451672359242009258...

This result is a very good approximation to the value of golden ratio

Using $c_L = c_R = 12J$ as given above, the temperature formulae (2.4) and the Cardy formula

$$S_{Cardy} = \frac{\pi^2}{3}(c_L T_L + c_R T_R),$$

yields the Hawking-Bekenstein area-entropy law for generic Kerr

$$S_{BH} = S_{Cardy} = 2\pi M r_+ = \frac{Area}{4}.$$

We observe that from the Cardy formula, we have obtained: a) 1.612448473080299, a golden number; b) 125,0946 and 125,1013 values practically equals to the Higgs boson mass; c) 125,0946 * 9 * 10^{16} = 11.258514 and 125,1013 * 9 * 10^{16} = 11,259117 that are the values of Higgs boson energy; d) from the mean of the following results:1.6124484730802; 1.6229166447824; 1.6229340289199 we have obtained 1.61768690496, a very good approximation to the golden ratio; e) the value 1727,26819 result that 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. f) from this last result, we have obtained 11,9983 that is very near to the black hole entropy 12,1904 (that is the ln of 196884) and 23,9966 value that is linked to the "Ramanujan function" (an elliptic modular function that satisfies the need for "conformal symmetry") that has 24 "modes" corresponding to the physical vibrations of a bosonic string; g) 1.6437054117109, which is a recurring number in Ramanujan's equations.

Now, from the result of Cardy formula, we obtain:

1.082881599625141594279617562142655247561321835889694 8 * 10^81 * 33021.10 * (((5(sqrt(34)+sqrt(21))/3)

Where 33021,10 is a result of Mock Theta Function

Input interpretation:

$$1.0828815996251415942796175621426552475613218358896948 \times 10^{81} \times 33021.10 \left(5\left(\frac{1}{3}\left(\sqrt{34}+\sqrt{21}\right)\right)\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$6.206105... \times 10^{86}$

1.0828815996251415942796175621426552475613218358896948 * 10^81 * 1/3 * 33021.10 * (((5(sqrt(34)+sqrt(21))/3)))

Input interpretation:

$$1.0828815996251415942796175621426552475613218358896948 \times 10^{81} \times \frac{1}{3} \times 33\,021.10 \left(5\left(\frac{1}{3}\left(\sqrt{34}+\sqrt{21}\right)\right)\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$2.068702... \times 10^{86}$

The results 6,206105 * 10^{86} and 2,068702 * 10^{86} are the values of Dark Matter and Relic Gravitons entropies contained within the cosmic event horizon.

From the:

$$r_+ = M + \sqrt{M^2 - a^2},$$

We obtain:

((((((13.12806*10^39 + ((((sqrt((13.12806*10^39)^2-(((0.9/(13.12806*10^39)))^2))))))

Input interpretation:

$$13.12806 \times 10^{39} + \sqrt{(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$2.62561... \times 10^{40}$

For r_-

$$r_- = M - \sqrt{M^2 - a^2}$$

We obtain:

((((((13.12806*10^39 - ((((sqrt((13.12806*10^39)^2-(((0.9/(13.12806*10^39)))^2))))))

Input interpretation:

$$13.12806 \times 10^{39} - \sqrt{(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

0

Open code

sqrt((((((((((((13.12806*10^39 + ((((sqrt((13.12806*10^39)^2-(((0.9/(13.12806*10^39)))^2))))))))))))

Input interpretation:

$$\sqrt{13.12806 \times 10^{39} + \sqrt{(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.620374030895336214194439126981061718309819902740339... × 10^{20}

1.62037403089533621419443912698106171830981990274 × 10^20

From:

$$\omega(r - r_+) \ll 1,$$

We obtain the value of r for ω = 6.62606957 * 10^{-34}:

1/(6.62606957*10^-34) * (((((((((((((13.12806*10^39 + (((((((sqrt((13.12806*10^39)^2-(((0.9/(13.12806*10^39)))^2))))))))))))*6.62606957*10^-34+0.08333)))

Input interpretation:

$$\frac{1}{6.62606957 \times 10^{-34}} \left(\left(13.12806 \times 10^{39} + \sqrt{(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2}\right) \times 6.62606957 \times 10^{-34} + 0.08333\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.62561... \times 10^{40}$

This result is identical to the previous expression concerning r_+

For:

$$w^+ = \sqrt{\frac{r - r_+}{r - r_-}} e^{2\pi T_R \phi},$$

We obtain:

sqrt((((2.62561*10^40+2.62561*10^40)/(2.62561*10^40)))) * exp(2Pi*(2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))

Input interpretation:

$$\sqrt{\frac{2.62561 \times 10^{40} + 2.62561 \times 10^{40}}{2.62561 \times 10^{40}}} \exp\left(2\pi \times \frac{2.62561 \times 10^{40}}{4\pi \times \frac{0.9}{13.12806 \times 10^{39}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Power of 10 representation:

$10^{10^{79.91994257691320}}$

We have that T_R = (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))

For:

$$\phi = \frac{1}{4\pi T_R} \ln \frac{w^+(w^+ w^- + y^2)}{w^-},$$

From the above expression with positive sign, we obtain:

ln (((((((((((sqrt((((2.62561*10^40+2.62561*10^40)/(2.62561*10^40)))) * exp(2Pi*(2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))))))))))^2

Input interpretation:

$$\log\left(\left(\sqrt{\frac{2.62561\times 10^{40}+2.62561\times 10^{40}}{2.62561\times 10^{40}}}\exp\left(2\pi\times\frac{2.62561\times 10^{40}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)\right)^2\right)$$

- log(x) is the natural logarithm

Decimal approximation:

- More digits

$3.82991... \times 10^{80}$

From this result we obtain:

(3.8299072907333333333 × 10^80)^(Pi/34^2)

Input interpretation:

$(3.8299072907333333333\times 10^{80})^{\pi/34^2}$

Result:

- More digits

1.6557552945934677992 7...

1.6557552945934677992 7

Continued fraction:

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{14+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{15+\cfrac{1}{2+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Possible closed forms:

- More

π root of $867x^3 - 52302x^2 + 15595x + 6182$ near $x = 0.527043$ ≈ 1.6557552945934677992 57124 root of $9188x^3 - 60222x^2 + 32189x + 70096$ near $x = 1.65576$ $\approx$

1.6557552945934677992 63669

$$\frac{327494505\pi}{621380668} \approx 1.6557552945934677994 8852$$

We note that, the result 1,65575529... is practically equal to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164{,}2696$ i.e. 1,65578...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}} + \sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578 \ldots \Rightarrow$$

$$\Rightarrow \log\left(\left(\sqrt{\frac{2.62561\times10^{40}+2.62561\times10^{40}}{2.62561\times10^{40}}}\exp\left(2\pi\times\frac{2.62561\times10^{40}}{4\pi\times\frac{0.9}{13.12806\times10^{39}}}\right)\right)^2\right) \Rightarrow$$

$$\Rightarrow (3.8299072907333333333\times10^{80})^{\pi/34^2}$$

$$= 1.6557552945934677992 7\ldots$$

1.65575529459346779927

From:

$$T_R = \frac{r_+ - r_-}{4\pi a},$$

$$w^+ = \sqrt{\frac{r-r_+}{r-r_-}}e^{2\pi T_R\phi},$$

$$\phi = \frac{1}{4\pi T_R}\ln\frac{w^+(w^+w^- + y^2)}{w^-},$$

We obtain the following inverse formula:

$$\exp \frac{2\pi T_R}{\ln(\omega^+)^2}$$

That yield:

exp(((2Pi*(2.62561*10^40)))/(((4Pi*(0.9/13.12806*10^39))) * ln (((((((sqrt((((2.62561*10^40+2.62561*10^40)/(2.62561*10^40)))) * exp(2Pi*(2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39))))))))))^2

Input interpretation:

$$\exp\left(\frac{2\pi\times 2.62561\times 10^{40}}{\left(4\pi\times\frac{0.9}{13.12806\times 10^{39}}\right)\log\left(\left(\sqrt{\frac{2.62561\times 10^{40}+2.62561\times 10^{40}}{2.62561\times 10^{40}}}\exp\left(2\pi\times\frac{2.62561\times 10^{40}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)\right)\right)^2}\right)$$

Open code

- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.648721270700128146848650787814163571653776100710148011575...

Or:

exp(((2Pi*(2.62561*10^40))) * 1/(((4Pi*(0.9/13.12806*10^39))) * ln (((((((sqrt((((2.62561*10^40+2.62561*10^40)/(2.62561*10^40)))) * exp(2Pi*(2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39))))))))))^2

Input interpretation:

$$\exp\left(\left(2\pi\times 2.62561\times 10^{40}\right)\times 1\Big/\left(\left(4\pi\times\frac{0.9}{13.12806\times 10^{39}}\right)\log\left(\left(\sqrt{\frac{2.62561\times 10^{40}+2.62561\times 10^{40}}{2.62561\times 10^{40}}}\exp\left(2\pi\times\frac{2.62561\times 10^{40}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)\right)\right)^2\right)\right)$$

Open code

- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.648721270700128146848650787814163571653776100710148011575...

1.648721270700128146848650787814163571653776100710148 0

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{17+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{21+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{25+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\sqrt{e} \approx 1.648721270700128146848650787814163571653776100710148011575$

$e^{(5\,\mathcal{W}_{\text{Wad}})/3} \approx$

$1.648721270700128146848650787814163571653776100710148011575$

$\frac{3(-26-217\pi+87\pi^2)}{-717-564\pi+280\pi^2} \approx 1.64872127070012814451501$

From:

$$w^+ = \sqrt{\frac{r-r_+}{r-r_-}}e^{2\pi T_R \phi},$$

where $\phi = 1.64872127 \ldots$

we obtain:

sqrt((((2.62561*10^40+2.62561*10^40)/(2.62561*10^40))))
exp^((((((1.64872127))2Pi*(2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39))))))

Input interpretation:

$$\sqrt{\frac{2.62561\times 10^{40}+2.62561\times 10^{40}}{2.62561\times 10^{40}}}\ \exp^{1.64872127\times 2\left(\pi\times\frac{2.62561\times 10^{40}}{4\,\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)}(x)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$$1.41421 \left(e^{x}\right)^{3.15722\times 10^{80}}$$

Series expansion at x = 0:

$$1.41421 + 4.46499\times 10^{80}\, x + 7.04849\times 10^{160}\, x^2 + 7.41789\times 10^{240}\, x^3 + 5.854984930671623\times 10^{320}\, x^4 + O(x^5)$$

(Taylor series)

Open code

Derivative:

- Step-by-step solution

$$\frac{d}{dx}\left(1.41421\, e^{315722480618006001565027434922798913353137634282076546079289821671035852078186496\,x}\right) = 446499014036060737765539835224486169654060965317631814922928252925291033599672320\, e^{315722480618006001565027434922798913353137634282076546079289821671035852078186496\,x}$$

The result of w^{+} = (((((1.41421 (e^1)^(3.15722×10^80))))))

Indefinite integral:

$$\int \sqrt{\frac{2.62561\times 10^{40} + 2.62561\times 10^{40}}{2.62561\times 10^{40}}}\, \exp\left(\frac{1.64872127\times 2\left(\pi\, 2.62561\times 10^{40}\right)}{\frac{4\pi\, 0.9}{13.12806\times 10^{39}}}\right)(x)\, dx = 4.47929\times 10^{-81} \left(2.71828^{x}\right)^{3.15722\times 10^{80}} + \text{constant}$$

Then:

1+1/((1.5236+1.4649)/2.01) (((((1.41421 (e^1)^(3.15722×10^80))))))^(1/10^240)

Where 1,5236 and 1,4649 are Hausdorff dimensions

Input interpretation:

$$1 + \frac{1}{\frac{1.5236+1.4649}{2.01}} \sqrt[10^{240}]{1.41421 \left(e^{1}\right)^{3.15722\times 10^{80}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- Fewer digits
- More digits

1.6725782164965701857118955997992303831353521833695834030 45...

1.6725782164965701857118955997992303831353521833695834

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{18+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{\cdots}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\frac{99970\,\mathcal{W}_{\text{Wad}}}{17931} \approx$ 1.672578216496570185711895599799230383135352183369583403045

$\frac{9997}{5977} \approx 1.672578216496570185711895599799230383135352183369583403045$

$\frac{1}{88}(95\,C + 96 - 130\,\pi + 58\,\pi^2 + 100\,\pi\log(2) - 121\,\pi\log(3)) \approx$ 1.67257821649657018567069

1+1/((3/2) (((((1.41421 (e^1)^(3.15722×10^80))))))^(1/10^240)

Input interpretation:

$$1+\frac{1}{\frac{3}{2}\sqrt[10^{240}]{1.41421\,(e^1)^{3.15722\times 10^{80}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.666666666666666666666666666666666666666666666666666666...

1.6666666666666666666666666666666666666666666666666666

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cdots}}}}$$

Open code

Possible closed forms:

- More

$\frac{5}{3} \approx 1.666666666666666666666666666666666666666666666666666666666$

Enlarge Data Customize A Plaintext Interactive

$-\coth\left(\frac{b_4(2)}{4}\right) \approx$
1.6666666666666666666666666666666666666666666666666666666

$\frac{50\,\mathcal{W}_{\text{Wad}}}{9} \approx$
1.6666666666666666666666666666666666666666666666666666666

- $\coth(x)$ is the hyperbolic cotangent function
- $b_4(2)$ is the Madelung constant $b_4(2)$
- $\mathcal{W}_{\text{Wad}}$ is the Wadsworth constant

This result 1,6666666667 is the following Hausdorff dimension:

$$\log_8(32) = \frac{5}{3}$$

The fractal dimension for the theoretical structure is log 32/log 8 = 1.6667.

1+1/((1.5236) (((((1.41421 (e^1)^(3.15722×10^80))))))^(1/10^240)

Input interpretation:

$$1 + \frac{1}{1.5236 \sqrt[10^{240}]{1.41421 \left(e^1\right)^{3.15722 \times 10^{80}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6563402467839327907587293252822263061170911000262536609871...

1.6563402467839327907587293252822263061170911000262536

Continued fraction:

- Linear form

$$1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{10 + \cfrac{1}{10 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{\ldots}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{21030\, \mathcal{W}_{Wad}}{3809} \approx$$
1.656340246783932790758729325282226306117091100026253609871

$$\frac{6309}{3809} \approx 1.656340246783932790758729325282226306117091100026253609871$$

$$\frac{240\,(5\, \mathcal{L}_{Li} - 3)}{1200\, \mathcal{L}_{Li} - 487} \approx 1.65634024678393279075873154 3$$

- $\mathcal{W}_{Wad}$ is the Wadsworth constant
- $\mathcal{L}_{Li}$ is Liouville's constant

We note that, the result 1,656340... is practically equal 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...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113 \quad \sqrt{505}}{8}} + \sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578 \ldots \Rightarrow$$

$$\Rightarrow \quad 1 + \frac{1}{1.5236 \sqrt[10^{240}]{1.41421\,(e^1)^{3.15722 \times 10^{80}}}}$$

= 1,656340...

1+1/((21/13+34/21)/2 (((((1.41421 (e^1)^(3.15722×10^80))))))^(1/10^240)

Input interpretation:

$$1 + \frac{1}{\left(\frac{1}{2}\left(\frac{21}{13} + \frac{34}{21}\right)\right) \sqrt[10^{240}]{1.41421\,(e^1)^{3.15722 \times 10^{80}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6183465458663646659116647791619479048697621744054360 13590...

1.6183465458663646659116647791619479048697621744054360

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\cdots}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\frac{14290\,\mathcal{W}_{\text{Wad}}}{2649} \approx$ 1.6183465458663646659116647791619479048697621744054360 13590

$\frac{1429}{883} \approx$ 1.6183465458663646659116647791619479048697621744054360 13590

$-\frac{68(13\xi-3)}{90\xi-251} \approx$ 1.61834654586636464 71386

- $\mathcal{W}_{\text{Wad}}$ is the Wadsworth constant
- ξ is Lehmer's constant

This result 1,6183465... is a very good approximation to the value of golden ratio.

With regard the result linked to the fractal Hausdorff dimension value 1.6667, we observe:

In this concluding section we give a formal argument that, whenever black hole microstates are in representations of large-diffeomorphism-generated Virasoro algebras, as conjectured for Kerr in this paper, the black hole Hilbert space must be contained within the Hilbert space of states outside the black hole. The observations apply equally to the case discussed here and to the stringy black holes with near-AdS_3 regions. Our argument is a refined and sharpened version of those made elsewhere from different perspectives and is perhaps in the general spirit, if not the letter, of black hole complementarity.[10]

If the Hilbert space is represented from a Clifford torus, it is possible that the Kerr black hole is a toroidal structure

From Wikipedia

Any unit sphere S^{2n-1} in an even-dimensional euclidean space $\mathbf{R}^{2n} = \mathbf{C}^n$ may be expressed in terms of the complex coordinates as follows:

$$S^{2n-1} = \{(z_1, \dots, z_n) \in \mathbf{C}^n : |z_1|^2 + \cdots + |z_n|^2 = 1\}.$$

Then, for any non-negative numbers $r_1, \ldots, r_n$ such that $r_1^2 + \ldots + r_n^2 = 1$, we may define a generalized Clifford torus as follows:

$$T_{r_1,\dots,r_n} = \{(z_1, \dots, z_n) \in \mathbf{C}^n : |z_k| = r_k,\ 1 \leqslant k \leqslant n\}.$$

These generalized Clifford tori are all disjoint from one another. We may once again conclude that the union of each one of these tori $T_{r_1, \ldots, r_n}$ is the unit $(2n-1)$-sphere S^{2n-1} (where we must again include the degenerate cases where at least one of the radii $r_k = 0$).

Now, we have the following formulas:

Here the left and right temperatures are defined by

$$T_L = \frac{r_+ + r_-}{4\pi a}, \quad T_R = \frac{r_+ - r_-}{4\pi a}, \tag{2.4}$$

with $r_- = M - \sqrt{M^2 - a^2}$ and the left and right soft mode energies are

$$\omega_L = \frac{2M^2}{a}\omega, \quad \omega_R = \frac{2M^2}{a}\omega - m, \tag{2.5}$$

with (ω, m) the soft mode energy and axial component of angular momentum. The left/right temperatures and entropies are thermodynamically conjugate, as follows from

$$\delta S_{BH} = \frac{\omega_L}{T_L} + \frac{\omega_R}{T_R}, \tag{2.6}$$

From (2.5), we obtain:

((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34

Input interpretation:

$$\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

6 663 081 602 758 622 917 844 886 720 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Scientific notation:

$6.663081602758622917844886720 \times 10^{87}$

(((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))))) - 0.9

Input interpretation:

$$\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34} - 0.9$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$6.66308160275862291784488671999999999999999999999999999... \times 10^{87}$

For (2.6) we have that:

6.663081602758622917844886719999 × 10^87 / ((((((((2*sqrt(((13.12806*10^39)^2-((0.9/13.12806*10^39))^2))))))/(((4Pi*((0.9/13.12806*10^39))))))))))))))

Input interpretation:

$$\frac{6.663081602758622917844886719999\times 10^{87}}{\frac{2\sqrt{(13.12806\times 10^{39})^2-\left(\frac{0.9}{13.12806\times 10^{39}}\right)^2}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

2.18623279149823328802502730784317690450075718539435294... × 10^8

((((6.66308160275862291784488672 × 10^87))))) / (((((((2*(((13.12806*10^39))))))))/(((4Pi*((0.9/13.12806*10^39))))))))

Input interpretation:

$$\frac{6.66308160275862291784488672 \times 10^{87}}{\frac{2\times 13.12806\times 10^{39}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

2.18623279149823328802502730784320971563713277920008334... × 10^8

and obtain:

(2.18623279149823328802502730784317690450075718539 × 10^8 + 2.18623279149823328802502730784320971563713277920 × 10^8)

Input interpretation:

2.18623279149823328802502730784317690450075718539 × 10^8 + 2.18623279149823328802502730784320971563713277920 × 10^8

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

4.37246558299646657605005461568638662013788996459 × 10^8

4.37246558299646657605005461568638662013788996459 × 10^8

1/2(((((4.37246558299646657605005461568638662013788996459 × 10^8)^1/41 + (4.37246558299646657605005461568638662013788996459 × 10^8)^1/42))))))

Input interpretation:

$$\frac{1}{2}\left(\sqrt[41]{4.37246558299646657605005461568638662013788996459\times 10^8} + \sqrt[42]{4.37246558299646657605005461568638662013788996459\times 10^8}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6152797540523920836243585751513024578986036910416...

1.615279754052392083624358575151302457898603691041 6

This value is a golden number, because is in the range of golden ratio value

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{56+\cfrac{1}{22+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{10+\cfrac{1}{25+\cfrac{1}{1+\cfrac{1}{19+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{5730828923\,\pi}{11146013561} \approx 1.61527975405239208362484359$$

$$\text{root of } 27537x^3 - 50886x^2 - 6179x + 26695 \text{ near } x = 1.61528 \approx 1.61527975405239208362472828$$

$$\pi\ \text{root of } 2862x^3 + 138583x^2 + 35890x - 55478 \text{ near } x = 0.51416 \approx 1.61527975405239208362270681$$

((4.37246558299646657605 × 10^8)^1/4 - (3^2 * 2)

Input interpretation:

$$\sqrt[4]{4.37246558299646657605 \times 10^8} - 3^2 \times 2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

126.60443067303825860 02...

This value is a good approximation to the Higgs boson mass 125,18

12 * ((4.37246558299646657605 × 10^8)^1/4

Input interpretation:

$$12\sqrt[4]{4.37246558299646657605\times 10^8}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1735.253168076459103202...

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

(((((12 * ((4.37246558299646657605 × 10^8)^1/4)))))^1/3

Input interpretation:

$$\sqrt[3]{12\sqrt[4]{4.37246558299646657605\times 10^8}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

12.01676630426109271740...

This result is very near to the value of black hole entropy 12,1904

2*(((((12 * ((4.37246558299646657605 × 10^8)^1/4)))))^1/3

Input interpretation:

$$2\sqrt[3]{12\sqrt[4]{4.37246558299646657605\times 10^8}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

24.03353260852218543480...

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

(((((12 * ((4.3724655829964665760 5 × 10^8)^1/4)))))^1/15

Input interpretation:

$$\sqrt[15]{12 \sqrt[4]{4.3724655829964665760 5 \times 10^8}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.644210900413182503922735646388027360304860958763404231333...

1.644210900413182503922735646388027360304860958763404 2

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{42+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{1}{660}\left(170 e^{\pi} - 364\pi - 897\log(\pi) - 692\log(2\pi) + 470\tan^{-1}(\pi)\right) \approx$$

1.644210900413182503 88142

$$\frac{3}{5}\pi\tan^2\left(\frac{13334359}{17749237}\right) \approx 1.64421090041318250390 0533$$

π root of $33415 x^3 + 8775 x^2 - 5581 x - 4273$ near $x = 0.523369$ $\approx$

1.64421090041318250394 1173

1/2 ((((((((((12 * ((4.3724655829964665760 5 × 10^8)^1/4)))))^1/16 + (((((12 * ((4.3724655829964665760 5 × 10^8)^1/4)))))^1/15))))))))

Input interpretation:

$$\frac{1}{2}\left(\sqrt[16]{12\sqrt[4]{4.37246558299646657605\times 10^8}}+\sqrt[15]{12\sqrt[4]{4.37246558299646657605\times 10^8}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6190538119604830985831467113497986512213948458159550776 35...

1.6190538119604830985831467113497986512213948458159550

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{365+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{15+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{190+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{3(13-315\pi+235\pi^2)}{-460+841\pi+31\pi^2}\approx 1.61905381196048309872111$$

$$\log\left(\frac{1}{150}\left(51+24\sqrt{2}+97e+4e^2-715\pi+266\pi^2\right)\right)\approx 1.61905381196048309865059$$

$$\frac{2456808703\pi}{4767162225}\approx 1.61905381196048309864067$$

This value 1,6190538 is very near to the golden ratio.

Now, we have that:

(4.372465582996466576050054615686386620137889964 59 × 10^8)^10

Input interpretation:

$(4.37246558299646657605005461568638662013788996459 \times 10^8)^{10}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $2.554253499139908070147691623774687951547799125384343 8\ldots \times 10^{86}$

1/2(2.4739 + 2.3347) * (4.37246558299646657605005461568638662013788996459 × 10^8)^10

Where 2.4739 and 2.3347 are Hausdorff dimensions

Input interpretation:

$\frac{1}{2}(2.4739 + 2.3347)$
$(4.37246558299646657605005461568638662013788996459 \times 10^8)^{10}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $6.141191687982080973056094971041482241906373437161577 8\ldots \times 10^{86}$

((((2.01 + 2.05)/2)) *1.2108) *
(4.37246558299646657605005461568638662013788996459 × 10^8)^10

Where 1.2108, 2.01 and 2.05 are Hausdorff dimensions

Input interpretation:

$\left(\left(\frac{1}{2}(2.01 + 2.05)\right) \times 1.2108\right)$
$(4.37246558299646657605005461568638662013788996459 \times 10^8)^{10}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $6.278160977619959403409694786674776108620172617461187 8\ldots \times 10^{86}$

This results 6,141191 * 10^{86} and 6,27816 * 10^{86} are practically equals to the value of Dark Matter entropy contained within the cosmic event horizon

(4.37246558299646657605005461568638662013788996459 × 10^8)^10 * (8^2 + 8*3)

Input interpretation:

$(4.37246558299646657605005461568638662013788996459 \times 10^8)^{10} (8^2 + 8 \times 3)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

  $2.2477430792431191017299686289217253973620632303382225... \times 10^{88}$

This result is practically equal to the value of Photons entropy contained within the cosmic event horizon

1/4 (4.37246558299646657605005461568638662013788996459 × 10^8)^12

Input interpretation:

$\frac{1}{4} (4.37246558299646657605005461568638662013788996459 \times 10^8)^{12}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

  $1.2208345320753103915688189029689024076435144197627255... \times 10^{103}$

This result is practically equal to the value of SMBHs entropy contained within the cosmic event horizon

1/2 (4.37246558299646657605005461568638662013788996459 × 10^8)^14 * (24+32)

Input interpretation:

$\frac{1}{2} (4.37246558299646657605005461568638662013788996459 \times 10^8)^{14} (24 + 32)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

  $2.6141326846917046142667393429828819360142207485603881... \times 10^{122}$

This result is practically equal to the total entropy of Cosmic Event Horizon 2,6 * 10^{122} . We note that, from the square root of this value, we obtain a multiple of a golden number, also near to the value of golden ratio. Indeed:

sqrt(((((1/2 (4.37246558299646657605005461568638662013788996459 × 10^8)^14 * (24+32)))))

Input interpretation:

$$\sqrt{\frac{1}{2}\left(4.37246558299646657605005461568638662013788996459\times 10^{8}\right)^{14}(24+32)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $1.6168279700363006196217095403161419493269698876\ldots \times 10^{61}$

Now, we note that from the formula:

$$\omega_L = \frac{2M^2}{a}\omega,$$

We obtain the following interesting expressions:

-8^2+((((((((((((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))^1/27))))))))

Input interpretation:

$$-8^2 + \sqrt[27]{\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  1725.488...

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

((((((((((-8^2+((((((((((((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))^1/27))))))))^1/3

Input interpretation:

$$\sqrt[3]{-8^2 + \sqrt[27]{\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

11.99418...

This result is very near to the value of black hole entropy 12,1904

2*((((((((((-8^2+((((((((((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))^1/27))))))))^1/3

Input interpretation:

$$2\sqrt[3]{-8^2 + \sqrt[27]{\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

23.98836...

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

((((((((((-8^2+((((((((((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))^1/27))))))))^1/15

Input interpretation:

$$\sqrt[15]{-8^2 + \sqrt[27]{\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6435923980586093145799367873492901635775398091369341 35253...

1.6435923980586093145799367873492901635775398091369341

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{13+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{4054396171\,\pi}{7749647200} \approx 1.64359239805860931458978 3$$

$$\pi \approx \text{root of } 187x^5+58x^4+590x^3-346x^2+45x-25 \text{ near } x=0.523172 \approx$$

$$1.6435923980586093145822 32$$

$$\text{root of } 4633x^3-44723x^2-3151x+105423 \text{ near } x=1.64359 \approx$$

$$1.64359239805860931457143 56$$

Now, from the above expression without -8^2, we obtain:

(1.2108+1.5236+1.2)*((((((((((((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))^1/27))))))))^1/16

Input interpretation:

$$(1.2108+1.5236+1.2)\sqrt[16]{\sqrt[27]{\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

6.283101212449482033903660253656488074073290259365730848044...

6.283101212449482033903660253656488074073290259365730 8

1/2*(1.2108+1.5236+1.2)*((((((((((((((((2*13.12806*10^39)^2))) / ((((0.9 / 13.12806*10^39)))) * 6.62606957*10^-34))))))^1/27))))))))^1/16

Input interpretation:

$$\frac{1}{2}(1.2108+1.5236+1.2)\sqrt[16]{\sqrt[27]{\frac{(2\times 13.12806\times 10^{39})^2}{\frac{0.9}{13.12806\times 10^{39}}}\times 6.62606957\times 10^{-34}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

3.141550606224741016951830126828244037036645129682865424022...

3.141550606224741016951830126828244037036645129682865 4

Continued fraction:

- Linear form

$$3+\cfrac{1}{7+\cfrac{1}{15+\cfrac{1}{2+\cfrac{1}{10+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{26+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{4}{7}\pi\tanh^{-1}\left(\frac{4076179}{4698792}\right)^2 \approx 3.14155060622474103922 1$$

$$\sqrt{\frac{1}{851}(-1817+4895e-902\pi-370\log(2))} \approx 3.14155060622474101704 14$$

$$\frac{6942178559\pi}{6942271475} \approx 3.14155060622474101695 92276$$

This results 3,1415506... and 6,2831012 are very good approximations to π, that is equal to 3.14159265... and 2π, that is equal to 6,283185...

We have that T_R = (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))

The result of w^+ = (((((1.41421 (e^1)^(3.15722×10^80))))))

We wish to restrict ε so that ζ is invariant under 2π azimuthal rotations (3.5). A complete set of such functions is[4]

$$\varepsilon_n = 2\pi T_R (w^+)^{1+\frac{in}{2\pi T_R}}. \tag{4.3}$$

From the (4.3), we obtain:

(((((2Pi * (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))))))) * (((((1.41421 (e^1)^(3.15722×10^80))))))^(((((1+(((2/(((((2Pi* (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))))))

Input interpretation:

$$\left(2\pi\times\frac{2.62561\times10^{40}}{4\pi\times\frac{0.9}{13.12806\times10^{39}}}\right)\left(1.41421\left(e^1\right)^{3.15722\times10^{80}}\right)^{1+2/\left(2\pi\times\frac{2.62561\times10^{40}}{4\pi\times\frac{0.9}{13.12806\times10^{39}}}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Power of 10 representation:

$$10^{10^{80.13708915656211}}$$

Now, we carry out the exponentiation ($1/10^{80}$) of

(((((\[((((((((((((((((((((((((1.41421 (e^1)^(3.15722×10^80))))))^(((((1+(((2/(((((2Pi* (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39))))))))))))))))))))]^(1/10^80))))))

Input interpretation:

$$\sqrt[10^{80}]{\left(1.41421\left(e^1\right)^{3.15722\times10^{80}}\right)^{1+2/\left(2\pi\times\frac{2.62561\times10^{40}}{4\pi\times\frac{0.9}{13.12806\times10^{39}}}\right)}}$$

Open code

- Units »

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

23.5052...

and of:

(((((2Pi * (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39)))))))) ^(1/10^80))))))

Input interpretation:

$$\sqrt[10^{80}]{2\pi\times\frac{2.62561\times 10^{40}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.0000000000000000000000000000000000000000000000000000000...

The final result is 23.5052... Multiplying the expression by 73 = $8^2 + 3^2$ we obtain:

(8^2+3^2)*(((((([((((((((((((((((((((((((1.41421 (e^1)^(3.15722×10^80))))))^(((((1+(((2/(((((2Pi* (2.62561*10^40)/(((4Pi*(0.9/13.12806*10^39))))))))))))))))))]^(1/10^80))))))*1

Input interpretation:

$$(8^2+3^2)\left(\sqrt[10^{80}]{\left(1.41421\,(e^1)^{3.15722\times 10^{80}}\right)^{1+2/\left(2\pi\times\frac{2.62561\times 10^{40}}{4\pi\times\frac{0.9}{13.12806\times 10^{39}}}\right)}}\times 1\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

1715.88...

1715.876728876313701464016023110453283163221807410969 3

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

Continued fraction:

- Linear form

$$1715+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{11+\cfrac{1}{3+\cfrac{1}{248+\cfrac{1}{21+\cfrac{1}{255+\cfrac{1}{17+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi \approx 1715.87672887631370143 1438$$

$$\pi \text{ root of } 4x^5-2186x^4+699x^3-569x^2+916x+3358 \text{ near } x=546.181 \approx$$

1715.8767288763137014 36315

$$\frac{-5525\pi\,\pi!+7066-10479\pi+33285\pi^2}{33\pi} \approx 1715.876728876313701463 9644$$

From the first closed form

1114+(4632/Pi)+((1249/(sqrtPi)))-(468(sqrtPi))-238Pi

We obtain:

((((1114+(4632/Pi)+((1249/(sqrtPi)))-(468(sqrtPi))-238Pi))))^1/3

Input:

$$\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

11.971870987138955778223502750228372331450959775316502778 17...

Open code

This result is very near to the value of black hole entropy 12,1904

Property:

$$\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} \text{ is a transcendental number}$$

Open code

Series representations:

- More

$$\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} =$$

$$\left(1114+\frac{4632}{\pi}-238\pi+\frac{1249}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}}-\right.$$

$$\left.468\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\hat{}\,(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} =$$

$$\left(1114+\frac{4632}{\pi}-238\pi+\frac{1249}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}-\right.$$

$$\left.468\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\hat{}\,(1/3)$$

Open code

$$\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} =$$

$$\left(1114+\frac{4632}{\pi}-238\pi+\frac{2498\sqrt{\pi}}{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}-\right.$$

$$\left.\frac{234\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)\hat{}\,(1/3)$$

Integral representation:

$$(1+z)^a = \frac{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(s)\,\Gamma(-a-s)}{z^s}\,ds}{(2\,\pi\,i)\,\Gamma(-a)} \quad \text{for } (0 < \gamma < -\text{Re}(a) \text{ and } |\arg(z)| < \pi)$$

2*((((1114+(4632/Pi)+((1249/(sqrtPi)))-(468(sqrtPi))-238Pi))))^1/3

Input:

$$2\sqrt[3]{1114 + \frac{4632}{\pi} + \frac{1249}{\sqrt{\pi}} - 468\sqrt{\pi} - 238\,\pi}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

23.94374197427791155644700550045674466290191955063300555635...

Open code

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

Property:

$$2\sqrt[3]{1114 + \frac{4632}{\pi} + \frac{1249}{\sqrt{\pi}} - 468\sqrt{\pi} - 238\,\pi} \text{ is a transcendental number}$$

Series representations:

- More

$$2\sqrt[3]{1114 + \frac{4632}{\pi} + \frac{1249}{\sqrt{\pi}} - 468\sqrt{\pi} - 238\,\pi} = 2\left(1114 + \frac{4632}{\pi} - 238\,\pi + \frac{1249}{\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}} - 468\sqrt{-1+\pi}\,\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\text{^}(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$2\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} =$$

$$2\left(1114+\frac{4632}{\pi}-238\pi+\frac{1249}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}-468\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^{\wedge}(1/3)$$

Open code

$$2\sqrt[3]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} =$$

$$2\left(1114+\frac{4632}{\pi}-238\pi+\frac{2498\sqrt{\pi}}{\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}-\frac{234\sum_{j=0}^{\infty}\text{Res}_{s=-\frac{1}{2}+j}(-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)^{\wedge}(1/3)$$

((((1114+(4632/Pi)+((1249/(sqrtPi))-(468(sqrtPi))-238Pi))))^1/15

Input:

$$\sqrt[15]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

1.642980487335409637370662738329715383236461624513985577150...

Open code

1.6429804873354...

Property:

$$\sqrt[15]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi}$$ is a transcendental number

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{41+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{19+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\sqrt[15]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} = \left(1114+\frac{4632}{\pi}-238\pi+\frac{1249}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}}-468\sqrt{-1+\pi}\sum_{k=0}^{\infty}(-1+\pi)^{-k}\binom{\frac{1}{2}}{k}\right)\text{^}(1/15)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt[15]{1114+\frac{4632}{\pi}+\frac{1249}{\sqrt{\pi}}-468\sqrt{\pi}-238\pi} = \left(1114+\frac{4632}{\pi}-238\pi+\frac{1249}{\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}}-468\sqrt{-1+\pi}\sum_{k=0}^{\infty}\frac{(-1)^k(-1+\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\text{^}(1/15)$$

Open code

$$\sqrt[15]{1114 + \frac{4632}{\pi} + \frac{1249}{\sqrt{\pi}} - 468\sqrt{\pi} - 238\pi} =$$

$$\left(1114 + \frac{4632}{\pi} - 238\pi + \frac{2498\sqrt{\pi}}{\sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} (-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)} - \frac{234\sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} (-1+\pi)^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)^{\wedge}(1/15)$$

Integral representation:

$$(1+z)^a = \frac{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\Gamma(s)\,\Gamma(-a-s)}{z^s}\,ds}{(2\,\pi\,i)\,\Gamma(-a)} \quad \text{for } (0 < \gamma < -\operatorname{Re}(a) \text{ and } |\arg(z)| < \pi)$$

Open code

•

Now, we analyze two formulas concerning the Hawking radiation.

From Wikipedia

Hawking radiation is black-body radiation that is predicted to be released by black holes, due to quantum effects near the event horizon. It is named after the theoretical physicist Stephen Hawking, who provided a theoretical argument for its existence in 1974.

The radiation from a Schwarzschild black hole is blackbody radiation with temperature

$$T = \frac{\hbar\,c^3}{8\,\pi\,G\,k_B\,M} \approx 1.227 \times 10^{+23}\,\mathrm{K{\cdot}kg} \times \frac{1}{M} = 6.169 \times 10^{-8}\,\mathrm{K} \times \frac{M_\odot}{M}$$

For simplicity, assume a black hole is a perfect blackbody ($\varepsilon = 1$).

Stefan–Boltzmann–Schwarzschild–Hawking black hole radiation power law derivation:

$$P = A_s \varepsilon \sigma T_H^4 = \left(\frac{16\pi G^2 M^2}{c^4}\right)\left(\frac{\pi^2 k_B^4}{60\hbar^3 c^2}\right)\left(\frac{\hbar c^3}{8\pi G M k_B}\right)^4 = \frac{\hbar c^6}{15360\pi G^2 M^2}$$

Now, from the our usual values used in this research paper, we obtain the following interesting expressions:

For T, we have:

((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23))))

Input interpretation:

$$\frac{1.054571726 \times 10^{-34} (3 \times 10^8)^3}{8 \pi \times 6.67408 \times 10^{-11} \times 13.12806 \times 10^{39} \times 1.380649 \times 10^{-23}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$9.36537... \times 10^{-18}$

For P, where M (mass of BH) is express in energy, we have:

((((((6.582*10^-16) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))

Input interpretation:

$$\frac{6.582 \times 10^{-16} (3 \times 10^8)^6}{15\,360\, \pi (6.67 \times 10^{-11})^2 (13.12806 \times 10^{39} \times 9 \times 10^{16})^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.60106... \times 10^{-63}$

This result is practically equal to the 15th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164{,}2696$ i.e. 1,6010451...

Indeed, from 1,6010451 it is possible to obtain, simply multiplying by 10^{-63}, the following mathematical connection:

1.60104512 * 10^-63

Input interpretation:

$$\frac{1.60104512}{10^{63}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
$1.60104512 \times 10^{-63}$

Indeed:

$$\sqrt[15]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} \times 10^{-63} = 1{,}6010451 \ldots \times 10^{-63} \Rightarrow$$

$$\Rightarrow \frac{6.582 \times 10^{-16} (3 \times 10^8)^6}{15\,360\,\pi (6.67 \times 10^{-11})^2 (13.12806 \times 10^{39} \times 9 \times 10^{16})^2}$$

$$= 1.60106\ldots \times 10^{-63}$$

Note that, this result concerning P, i.e. the energy dispersion, is an infinitesimal golden number, that is in the range of golden ratio (1.61803398...). Moreover, there is a practically perfect correspondence with the above Ramanujan class invariant, multiplied by 10^{-63}

For P, we have also this alternate formula:

((((((1.054571*10^-34) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))

Input interpretation:

$$\frac{1.054571 \times 10^{-34} (3 \times 10^8)^6}{15\,360\,\pi (6.67 \times 10^{-11})^2 (13.12806 \times 10^{39} \times 9 \times 10^{16})^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

$2.56522\ldots \times 10^{-82}$

We have calculated the square root of P:

sqrt((((((((1.054571*10^-34) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))))

Input interpretation:

$$\sqrt{\frac{1.054571\times 10^{-34}\,(3\times 10^{8})^{6}}{15\,360\,\pi\,(6.67\times 10^{-11})^{2}\,(13.12806\times 10^{39}\times 9\times 10^{16})^{2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $1.60163\ldots\times 10^{-41}$

Also this result, is an infinitesimal golden number, that is in the range of golden ratio (1.61803398...)

For T, we have developed the following computations:

((((((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23)))))))*(((Pi^(5/2)))

Input interpretation:

$$\frac{1.054571726\times 10^{-34}\,(3\times 10^{8})^{3}}{8\,\pi\times 6.67408\times 10^{-11}\times 13.12806\times 10^{39}\times 1.380649\times 10^{-23}}\,\pi^{5/2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $1.63832\ldots\times 10^{-16}$

This result is a golden number, that is in the range of golden ratio (1.61803398...)

((((((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23)))))))*(((Pi(Pi+ln(12)))

Input interpretation:

$$\frac{1.054571726\times 10^{-34}\,(3\times 10^{8})^{3}}{8\,\pi\times 6.67408\times 10^{-11}\times 13.12806\times 10^{39}\times 1.380649\times 10^{-23}}\,(\pi\,(\pi+\log(12)))$$

Open code

- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $1.65544\ldots\times 10^{-16}$

This result is practically equal 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...

Indeed, from 1,65578 it is possible to obtain, simply multiplying by 10^{-16}:

1.65578455 * 10^-16

Input interpretation:

$$\frac{1.65578455}{10^{16}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$1.65578455 \times 10^{-16}$

Thence:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} \times 10^{-16} = 1{,}65578\ldots \times 10^{-16} \Rightarrow$$

$$\Rightarrow \frac{1.054571726 \times 10^{-34} (3 \times 10^8)^3}{8\pi \times 6.67408 \times 10^{-11} \times 13.12806 \times 10^{39} \times 1.380649 \times 10^{-23}}(\pi(\pi + \log(12)))$$

$$= 1.65544\ldots \times 10^{-16}$$

From the formula of P, we obtain:

2*8^2+((((((6.582*10^-16) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))*10^66

Input interpretation:

$$2 \times 8^2 + \frac{6.582 \times 10^{-16} (3 \times 10^8)^6}{15\,360\,\pi (6.67 \times 10^{-11})^2 (13.12806 \times 10^{39} \times 9 \times 10^{16})^2} \times 10^{66}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1729.0560104797496931391422673480256709729668583261422999 73...

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

(((((((2*8^2+((((((6.582*10^-16) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))*10^66)))))))^1/3

Input interpretation:

$$\sqrt[3]{2\times 8^2+\frac{6.582\times 10^{-16}\,(3\times 10^8)^6}{15\,360\,\pi\,(6.67\times 10^{-11})^2\,(13.12806\times 10^{39}\times 9\times 10^{16})^2}\times 10^{66}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

12.0024...

This result is very near to the value of black hole entropy 12,1904

2*(((((((2*8^2+((((((6.582*10^-16) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))*10^66)))))))^1/3

Input interpretation:

$$2\sqrt[3]{2\times 8^2+\frac{6.582\times 10^{-16}\,(3\times 10^8)^6}{15\,360\,\pi\,(6.67\times 10^{-11})^2\,(13.12806\times 10^{39}\times 9\times 10^{16})^2}\times 10^{66}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

24.0049...

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

(((((((2*8^2+((((((6.582*10^-16) * (3*10^8)^6))))) / ((((((15360Pi * (6.67*10^-11)^2 * (13.12806*10^39 * 9*10^16)^2))))))*10^66)))))))^1/15

Input interpretation:

$$\sqrt[15]{2\times 8^2+\frac{6.582\times 10^{-16}\,(3\times 10^8)^6}{15\,360\,\pi\,(6.67\times 10^{-11})^2\,(13.12806\times 10^{39}\times 9\times 10^{16})^2}\times 10^{66}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643818778757894356449418348891451089565000834878733225943...

1.643818778757894356449418348891451089565000834878733 2

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{20+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{21+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Open code

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Possible closed forms:

- More

$$\cosh\left(\csc\left(\frac{12\,280\,403}{2\,841\,266}\right)\right)\approx 1.64381877875789435777135$$

$$-\frac{2\,(40-218\,\pi+157\,\pi^2)}{111-681\,\pi+94\,\pi^2}\approx 1.64381877875789435555362$$

$$\frac{2\,386\,199\,299\,\pi}{4\,560\,396\,976}\approx 1.643818778757894356426417$$

From the formula of T, we obtain:

24*3 + ((((((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23)))))))*(((Pi(Pi+ln(12))) * 10^19

Input interpretation:

$$24\times 3+\frac{1.054571726\times 10^{-34}\,(3\times 10^{8})^{3}}{8\,\pi\times 6.67408\times 10^{-11}\times 13.12806\times 10^{39}\times 1.380649\times 10^{-23}}\,((\pi\,(\pi+\log(12)))\times 10^{19})$$

Open code

- $\log(x)$ is the natural logarithm

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Result:

- Fewer digits
- More digits

1727.438023535350916466186316176736864390275463060110302194...

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

((((((((24*3 + (((((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23)))))))*(((Pi(Pi+ln(12))) * 10^19))))))))^1/3

Input interpretation:

$$\left(24\times 3+\frac{1.054571726\times 10^{-34}\,(3\times 10^{8})^{3}}{8\,\pi\times 6.67408\times 10^{-11}\times 13.12806\times 10^{39}\times 1.380649\times 10^{-23}}\,((\pi\,(\pi+\log(12)))\times 10^{19})\right)\text{^}(1/3)$$

Open code

- $\log(x)$ is the natural logarithm

Result:

- More digits

11.9987...

This result is very near to the value of black hole entropy 12,1904

2*((((((((24*3 + (((((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23)))))))*(((Pi(Pi+ln(12))) * 10^19))))))))^1/3

Input interpretation:

$$2\left(24\times 3+\frac{1.054571726\times 10^{-34}\,(3\times 10^{8})^{3}}{8\,\pi\times 6.67408\times 10^{-11}\times 13.12806\times 10^{39}\times 1.380649\times 10^{-23}}\,((\pi\,(\pi+\log(12)))\times 10^{19})\right)\text{^}(1/3)$$

Open code

- log(x) is the natural logarithm

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Result:

- More digits

23.9974...

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

((((((((24*3 + ((((((((1.054571726*10^-34) * (3*10^8)^3))) / ((((8Pi * 6.67408*10^-11 * 13.12806*10^39 * 1.380649*10^-23)))))))*(((Pi(Pi+ln(12))) * 10^19))))))))^1/15

Input interpretation:

$$\left(24\times 3+\frac{1.054571726\times 10^{-34}\,(3\times 10^{8})^{3}}{8\,\pi\times 6.67408\times 10^{-11}\times 13.12806\times 10^{39}\times 1.380649\times 10^{-23}}\,((\pi\,(\pi+\log(12)))\times 10^{19})\right)\hat{}\,(1/15)$$

Open code

- log(x) is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643716185610309160791099966247523548170651778381071336977...

1.6437161856103091607910999662475235481706517783810713

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

More

- $\frac{511326979\,\pi}{977286161} \approx 1.64371618561030916087814$

  $\text{root of } 747x^4+674x^3+867x^2-3692x-4720 \text{ near } x = 1.64372 \approx 1.64371618561030916078282 9$

  $\pi\ \text{root of } 341x^4+8142x^3-375x^2-2114x+17 \text{ near } x = 0.523211 \approx 1.64371618561030916076062 5$

From:

Particle Creation by Black Holes

S. W. Hawking
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Received April 12, 1975

[2] Note

[2] Note in Italian: All'aumentare della temperatura, si supererebbe la massa residua di particelle come l'elettrone e il muone e il buco nero inizierebbe ad emetterli anche. Quando la temperatura è salita a circa 10^12 ° K o quando la massa è scesa a circa 10^14 g il numero di diverse specie di particelle emesse potrebbe essere così grande che il buco nero irradia via tutta la sua massa a riposo rimanente su una forte scala temporale di interazione dell'ordine di 10^-23 s. Ciò produrrebbe un'esplosione con un'energia di 10^35 erg

Abstract. In the classical theory black holes can only absorb and not emit particles. However it is shown that quantum mechanical effects cause black holes to create and emit particles as if they were hot bodies with temperature $\frac{\hbar\kappa}{2\pi k} \approx 10^{-6}\left(\frac{M_\odot}{M}\right)$ °K where κ is the surface gravity of the black hole. This thermal emission leads to a slow decrease in the mass of the black hole and to its eventual disappearance: any primordial black hole of mass less than about 10^{15} g would have evaporated by now. Although these quantum effects violate the classical law that the area of the event horizon of a black hole cannot decrease, there remains a Generalized Second Law: $S+\frac{1}{4}A$ never decreases where S is the entropy of matter outside black holes and A is the sum of the surface areas of the event horizons. This shows that gravitational collapse converts the baryons and leptons in the collapsing body into entropy. It is tempting to speculate that this might be the reason why the Universe contains so much entropy per baryon.

For a given frequency ω, i.e. a given value of j, the absorption fraction Γ_{jn} goes to zero as the angular quantum number l increases because of the centrifugal barrier. Thus at first sight it might seem that each wave-packet mode of high l value would contain

$$\{\exp(2\pi\omega\kappa^{-1})-1\}^{-1}$$

particles and that the total rate of particles and energy crossing the event horizon would be infinite. This calculation would, of course, be inconsistent with the result obtained above that an observer crossing the event horizon would see only a finite small energy density of order M^{-4}. The reason for this discrepancy seems to be that the wave-packets $\{p_{jn}\}$ and $\{q_{jn}\}$ provide a complete basis for solutions

We have:

temperature $\frac{\hbar\kappa}{2\pi k} \approx 10^{-6}\left(\frac{M_\odot}{M}\right)$ °K

and the particles contained in each wave-packet mode of high value of quantum number l, are:

$$\{\exp(2\pi\omega\kappa^{-1})-1\}^{-1}$$

With the our values, where **a** = J/M and

For a Schwarzchild black hole $\kappa = \frac{1}{4M}$

and $\omega = \Omega = \frac{a}{\alpha} = \frac{J}{M} \cdot \frac{1}{\alpha}$

thence:

1 / exp(2π * (J/M * 1/α) * 1/(1/4M) – 1)

remember that:

$$\begin{cases} \Theta = \dfrac{r_+ - r_-}{4\alpha} & \text{“gravità di superficie”} \\ \phi = \dfrac{r_+ Q}{\alpha} & \text{“potenziale elettrico”} \\ \Omega = \dfrac{a}{\alpha} & \text{“frequenza angolare”.} \end{cases}$$

We obtain:

1/ ((((exp((((((((((2Pi * (0.9/13.12806*10^39) * 1/(6.8938278721*10^80) * 4*(13.12806*10^39)))))))))) - 1))))

Input interpretation:

$$\frac{1}{\exp\left(2\pi \times \frac{0.9}{13.12806 \times 10^{39}} \times \frac{1}{6.8938278721 \times 10^{80}} \times 4 \times 13.12806 \times 10^{39}\right) - 1}$$

Open code

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Result:

$\tilde{\infty}$

- $\tilde{\infty}$ is complex infinity

Decimal approximation:

- More digits

$3.04774... \times 10^{79}$

$3.047741062970548 \times 10^{79}$

(((3.04774106297054838149866381067383501125196657352 × 10^79)))^(Pi/1140)

Input interpretation:

$(3.04774106297054838149866381067383501125196657352 \times 10^{79})^{\pi/1140}$

Open code

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Result:

- More digits

1.6559247521630664083848387291410505307142963602050...

Or:

(((3.047741062970548381498663810673835011251966573 52 × 10^79)))^(Pi/(34^2-16))

Input interpretation:

$(3.04774106297054838149866381067383501125196657352 \times 10^{79})^{\pi/(34^2-16)}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6559247521630664083848387291410505307142963602050...

1.655924752163...

We note that, the result 1,655924... is practically equal to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164{,}2696$ i.e. 1,65578...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105 \quad \sqrt{505}}{8}}\right)^3} = 1{,}65578\ldots \Rightarrow$$

$\Rightarrow (3.04774106297054838149866381067383501125196657352 \times 10^{79})^{\pi/(34^2-16)}$

$= 1{,}655924$

And:

(((3.04774106297054838149866381067383501125196657352 × 10^79)))^((Pi/(34^2+21+13+5))

Input interpretation:

$(3.04774106297054838149866381067383501125196657352 \times 10^{79})^{\pi/(34^2+21+13+5)}$

Open code

- Units »

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Result:

- More digits

1.6179281506203672598152036020629183817177756921349...

1.6179281506203672598152036020629183817177756921349

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

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{\ddots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

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Possible closed forms:

- More

$$\frac{300\sqrt{\frac{2510555}{9096929}}}{\pi^4} \approx 1.61792815062036728628 5$$

$$\frac{9}{8}\pi \cosh^{-1}\left(\frac{8298021}{6704084}\right)^2 \approx 1.61792815062036725 61936$$

$$\frac{2(-370-57\pi+21\pi^2)}{-1876+315\pi+47\pi^2} \approx 1.6179281506203672593 5672$$

From the following formula, concerning the particles contained in each wave-packet mode of high value of quantum number l:

$$\{\exp(2\pi\omega\kappa^{-1})-1\}^{-1}$$

that is equal to $3.0477410629705483814986638106738350112519665 7352 \times 10^{79}$

we can to obtain very interesting mathematical connections with the following formula:

From:

The function $T_1(n)$ alone gives the Hardy-Ramanujan asymptotic formula

$$p(n) \sim \frac{1}{4n\sqrt{3}} \cdot e^{\pi\sqrt{2n/3}}. \tag{2.2}$$

Partition number p(n) for n = 5046; p(5046) from OEIS is:

3,86854362344777917704746745903131435738863318963985417033290355377095128484

From Ramanujan formula for p(5046), we obtain:

(((1/(4*5046*sqrt(3))) * exp((((Pi*((((sqrt(((2*5046)/3)))))

Input:

$$\frac{1}{4\times 5046\sqrt{3}}\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)$$

Open code

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Exact result:

$$\frac{e^{58\pi}}{20\,184\sqrt{3}}$$

Decimal approximation:

- More digits

$3.8927871496803691534559901688545454305815654571794088\ldots \times 10^{74}$

Open code

Property:

$\frac{e^{58\pi}}{20\,184\sqrt{3}}$ is a transcendental number

Series representations:

- More

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)}{4\times 5046\sqrt{3}} = \frac{\exp\left(\pi\sqrt{3363}\sum_{k=0}^{\infty} 3363^{-k}\binom{\frac{1}{2}}{k}\right)}{20\,184\sqrt{2}\sum_{k=0}^{\infty} 2^{-k}\binom{\frac{1}{2}}{k}}$$

Open code

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$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)}{4\times 5046\sqrt{3}} = \frac{\exp\left(\pi\sqrt{3363}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{3363}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}{20\,184\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)}{4\times 5046\sqrt{3}} = \frac{\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3364-z_0)^k z_0^{-k}}{k!}\right)}{20\,184\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}}$$

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

Now, from the previous result of p(5046)

3.892787149680369153455990168854545430581565457179408896657868891 0835824746276758785865335420696017799119306 96... × 10^{74}

3.8927871496803691534559901688545454305815654571794088966578688910835 8247462 × 10^{74}

after some calculations, we obtain:

(((((196884*1/(ln(4)/ln(3)*2))))))[(((1/(4*5046*sqrt(3)))*
exp((((Pi*((((sqrt(((2*5046)/3)))))]

Thence, multiplying

Input:

$$\left(196\,884\times\frac{1}{\frac{\log(4)}{\log(3)}\times 2}\right)\left(\frac{1}{4\times 5046\sqrt{3}}\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)\right)$$

Open code

- $\log(x)$ is the natural logarithm

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Exact result:

$$\frac{5469\sqrt{3}\,e^{58\pi}\log(3)}{3364\log(4)}$$

Decimal approximation:

- More digits

3.0368971380696910100645999497040251010799179715079078... × 10^{79}

Open code

3.0368971380696910100645999497040251010799179715079078 × 10^{79}

Series representations:

- More

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)196\,884}{\frac{\left(4\times 5046\sqrt{3}\right)(\log(4)\,2)}{\log(3)}} = \frac{5469\sqrt{3}\,e^{58\pi}\left(\log(2)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{2}\right)^k}{k}\right)}{3364\left(\log(3)-\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{3}\right)^k}{k}\right)}$$

Open code

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$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)196\,884}{\frac{\left(4\times 5046\sqrt{3}\right)(\log(4)\,2)}{\log(3)}} = \frac{5469\sqrt{3}\,e^{58\pi}\left(2\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor - i\log(x) + i\sum_{k=1}^{\infty}\frac{(-1)^k(3-x)^k x^{-k}}{k}\right)}{3364\left(2\pi\left\lfloor\frac{\arg(4-x)}{2\pi}\right\rfloor - i\log(x) + i\sum_{k=1}^{\infty}\frac{(-1)^k(4-x)^k x^{-k}}{k}\right)} \quad \text{for } x < 0$$

Open code

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)196\,884}{\frac{\left(4\times 5046\sqrt{3}\right)(\log(4)\,2)}{\log(3)}} = \frac{5469\sqrt{3}\,e^{58\pi}\left(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(3-z_0)^k z_0^{-k}}{k}\right)}{3364\left(2\pi\left\lfloor\frac{\pi-\arg\left(\frac{1}{z_0}\right)-\arg(z_0)}{2\pi}\right\rfloor - i\log(z_0) + i\sum_{k=1}^{\infty}\frac{(-1)^k(4-z_0)^k z_0^{-k}}{k}\right)}$$

Integral representations:

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)196\,884}{\frac{\left(4\times 5046\sqrt{3}\right)(\log(4)\,2)}{\log(3)}} = \frac{5469\sqrt{3}\,e^{58\pi}\int_1^3\frac{1}{t}\,dt}{3364\int_1^4\frac{1}{t}\,dt}$$

Open code

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$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5046}{3}}\right)196\,884}{\frac{\left(4\times 5046\sqrt{3}\right)(\log(4)\,2)}{\log(3)}} = \frac{5469\sqrt{3}\,e^{58\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{2^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds}{3364\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{3^{-s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds} \quad \text{for } -1<\gamma<0$$

This result 3.036897138... × 10^{79} is a good approximation to the value of the particles' number contained in each wave-packet mode.

For n = 5697 from OEIS

p(5697) =
3.0538723337391660587957188453906776444982487452257640926684434740142
157911918583 * 10^{79}

From the Ramanujan formula, we obtain:

(((1/(4*5697*sqrt(3))) * exp((((Pi*((((sqrt(((2*5697)/3))))))

Input:

$$\frac{1}{4\times 5697\sqrt{3}}\exp\left(\pi\sqrt{\frac{2\times 5697}{3}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{e^{3\sqrt{422}\,\pi}}{22\,788\sqrt{3}}$$

Decimal approximation:

- More digits

3.0718793263020345822883525238695115274200010311387072... × 10^{79}

Open code

Property:

$\frac{e^{3\sqrt{422}\,\pi}}{22\,788\sqrt{3}}$ is a transcendental number

Series representations:

- More

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5697}{3}}\right)}{4\times 5697\sqrt{3}} = \frac{\exp\left(\pi\sqrt{3797}\sum_{k=0}^{\infty}3797^{-k}\binom{\frac{1}{2}}{k}\right)}{22\,788\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}}$$

Open code

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$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5697}{3}}\right)}{4\times 5697\sqrt{3}} = \frac{\exp\left(\pi\sqrt{3797}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{3797}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}{22\,788\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 5697}{3}}\right)}{4\times 5697\sqrt{3}} = \frac{\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3798-z_0)^k z_0^{-k}}{k!}\right)}{22\,788\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}}$$

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

3.071879326302034582288352523869511527420001031138707296059100160273810658480156514428247369468992012899508346... × 10^{79}

3.0718793263020345822883525238695115274200010311387072960591001602738 106584801565 * 10^{79}

This value is a good approximation to the particles' number contained in each wave-packet mode of high value of quantum number l

From the following coefficient formula, that is linked to the partition formula

The problem of estimating the coefficients $\alpha(n)$ has a long history, one which even precedes Dyson's definition of partition ranks. Indeed, Ramanujan's last letter to Hardy already includes the claim that

$$\alpha(n) = (-1)^{n-1}\frac{\exp\left(\pi\sqrt{\frac{n}{6}-\frac{1}{144}}\right)}{2\sqrt{n-\frac{1}{24}}} + O\left(\frac{\exp\left(\frac{1}{2}\pi\sqrt{\frac{n}{6}-\frac{1}{144}}\right)}{\sqrt{n-\frac{1}{24}}}\right).$$

for n = 5697, we obtain:

((((((((exp(pi*sqrt(5697/6-1/144)))))))/((((((((((((2*sqrt(5697-1/24))))))))))))) + (((((((exp(pi/2*sqrt(5697/6-1/144))))/(((sqrt(5697-1/24))))))))))))))

Input:

$$\frac{\exp\left(\pi\sqrt{\frac{5697}{6}-\frac{1}{144}}\right)}{2\sqrt{5697-\frac{1}{24}}}+\frac{\exp\left(\frac{\pi}{2}\sqrt{\frac{5697}{6}-\frac{1}{144}}\right)}{\sqrt{5697-\frac{1}{24}}}$$

Open code

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Exact result:

$$2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}$$

Decimal approximation:

- More digits

$$7.2917242148745695868420092647065351666410224157037936\ldots\times10^{39}$$

Open code

Property:

$$2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}$$ is a transcendental number

Series representations:

- More

$$\frac{\exp\left(\pi\sqrt{\frac{5697}{6}-\frac{1}{144}}\right)}{2\sqrt{5697-\frac{1}{24}}}+\frac{\exp\left(\frac{1}{2}\sqrt{\frac{5697}{6}-\frac{1}{144}}\,\pi\right)}{\sqrt{5697-\frac{1}{24}}}=\frac{2\exp\left(\frac{1}{2}\pi\sqrt{\frac{136583}{144}}\sum_{k=0}^{\infty}\left(\frac{136583}{144}\right)^{-k}\binom{\frac{1}{2}}{k}\right)+\exp\left(\pi\sqrt{\frac{136583}{144}}\sum_{k=0}^{\infty}\left(\frac{136583}{144}\right)^{-k}\binom{\frac{1}{2}}{k}\right)}{2\sqrt{\frac{136703}{24}}\sum_{k=0}^{\infty}\left(\frac{136703}{24}\right)^{-k}\binom{\frac{1}{2}}{k}}$$

Open code

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$$\frac{\exp\left(\pi\sqrt{\frac{5697}{6}-\frac{1}{144}}\right)}{2\sqrt{5697-\frac{1}{24}}}+\frac{\exp\left(\frac{1}{2}\sqrt{\frac{5697}{6}-\frac{1}{144}}\,\pi\right)}{\sqrt{5697-\frac{1}{24}}}=\frac{2\exp\left(\frac{1}{2}\pi\sqrt{\frac{136583}{144}}\sum_{k=0}^{\infty}\frac{\left(-\frac{144}{136583}\right)^{k}\left(-\frac{1}{2}\right)_k}{k!}\right)+\exp\left(\pi\sqrt{\frac{136583}{144}}\sum_{k=0}^{\infty}\frac{\left(-\frac{144}{136583}\right)^{k}\left(-\frac{1}{2}\right)_k}{k!}\right)}{2\sqrt{\frac{136703}{24}}\sum_{k=0}^{\infty}\frac{\left(-\frac{24}{136703}\right)^{k}\left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

$$\frac{\exp\left(\pi\sqrt{\frac{5697}{6}-\frac{1}{144}}\right)}{2\sqrt{5697-\frac{1}{24}}}+\frac{\exp\left(\frac{1}{2}\sqrt{\frac{5697}{6}-\frac{1}{144}}\,\pi\right)}{\sqrt{5697-\frac{1}{24}}}=$$

$$\left(2\exp\left(\frac{1}{2}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{136727}{144}-z_0\right)^k z_0^{-k}}{k!}\right)+\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{136727}{144}-z_0\right)^k z_0^{-k}}{k!}\right)\right)\Bigg/\left(2\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{136727}{24}-z_0\right)^k z_0^{-k}}{k!}\right)\quad \text{for not }((z_0\in\mathbb{R}\text{ and }-\infty<z_0\le 0))$$

From the formula of property

$$2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}$$

is a transcendental number

after some calculations, we obtain:

((((((2 sqrt(6/136727) e^((sqrt(136727) π)/24) + sqrt(6/136727) e^((sqrt(136727) π)/12)))))))^(((Pi^(3/5)))

Input:

$$\left(2\sqrt{\frac{6}{136727}}\,e^{1/24\left(\sqrt{136727}\,\pi\right)}+\sqrt{\frac{6}{136727}}\,e^{1/12\left(\sqrt{136727}\,\pi\right)}\right)^{\pi^{3/5}}$$

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Exact result:

$$\left(2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^{\pi^{3/5}}$$

Decimal approximation:

- More digits

$1.675849037409569373423195546441049699630206076886977 9\ldots\times 10^{79}$

Open code

This value 1,675849 * 10^{79} is a multiple that is in the range of the golden ratio value. It can be defined a golden number.

Series representations:

$$\left(2\sqrt{\frac{6}{136\,727}}\, e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136\,727}}\, e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^{\pi^{3/5}} = \left(\exp\left(\frac{1}{24}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136\,727-z_0)^k z_0^{-k}}{k!}\right)\left(2+\exp\left(\frac{1}{24}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136\,727-z_0)^k z_0^{-k}}{k!}\right)\right)\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136\,727}-z_0\right)^k z_0^{-k}}{k!}\right)^{\pi^{3/5}} \quad \text{for not } ((z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

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$$\left(2\sqrt{\frac{6}{136\,727}}\, e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136\,727}}\, e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^{\pi^{3/5}} = \left(2\exp\left(\frac{1}{24}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(136\,727-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} + \exp\left(\frac{1}{12}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(136\,727-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136\,727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^{\pi^{3/5}} \quad \text{for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$\left(2\sqrt{\frac{6}{136727}}\, e^{\left(\sqrt{136727}\,\pi\right)/24} + \sqrt{\frac{6}{136727}}\, e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^{\pi^{3/5}} =$$

$$\left(2\exp\left(\frac{1}{24}\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (136727-z_0)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2+1/2\left\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!} + \exp\left(\frac{1}{12}\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (136727-z_0)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} z_0^{1/2+1/2\left\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^{\pi^{3/5}}$$

Integral representation:

$$(1+z)^a = \frac{\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{\Gamma(s)\,\Gamma(-a-s)}{z^s}\,ds}{(2\,\pi\,i)\,\Gamma(-a)} \quad \text{for } (0<\gamma<-\text{Re}(a) \text{ and } |\arg(z)|<\pi)$$

And:

1.2108/2.05 ((((((2 sqrt(6/136727) e^((sqrt(136727) π)/24) + sqrt(6/136727) e^((sqrt(136727) π)/12)))))))^2

Where 1,2108 and 2,05 are Hausdorff dimensions

Input interpretation:

$$\frac{1.2108}{2.05}\left(2\sqrt{\frac{6}{136727}}\, e^{1/24\left(\sqrt{136727}\,\pi\right)} + \sqrt{\frac{6}{136727}}\, e^{1/12\left(\sqrt{136727}\,\pi\right)}\right)^2$$

Open code

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Result:

- More digits

$3.14036\ldots \times 10^{79}$

This result is a good approximation to the particles' number contained in each wave-packet mode of high value of quantum number l and to the value of π (multiple)

Series representations:

$$\frac{\left(2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^2 1.2108}{2.05} =$$

$$0.590634\exp\left(\frac{1}{12}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136727-z_0)^k z_0^{-k}}{k!}\right)\left(4\sqrt{z_0}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2+\right.$$
$$4\exp\left(\frac{1}{24}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136727-z_0)^k z_0^{-k}}{k!}\right)\sqrt{z_0}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2+$$
$$\left.\exp\left(\frac{1}{12}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136727-z_0)^k z_0^{-k}}{k!}\right)\sqrt{z_0}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2\right) \text{ for not } ((z_0\in\mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

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$$\frac{\left(2\sqrt{\frac{6}{136727}}\, e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\, e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^2 1.2108}{2.05} = 0.590634$$

$$\exp\left(\frac{1}{12}\pi \exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (136\,727-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left(4\exp^2\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136\,727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136\,727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2 + 4\exp\left(\right.\right.$$
$$\left.\frac{1}{24}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(136\,727-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp^2\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2 +$$
$$\exp\left(\frac{1}{12}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(136\,727-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp^2\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2$$
$$\left.\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2\right) \text{ for } (x\in\mathbb{R} \text{ and } x<0)$$

$$\frac{\left(2 \sqrt{\frac{6}{136727}} e^{\left(\sqrt{136727} \pi\right)/24} + \sqrt{\frac{6}{136727}} e^{\left(\sqrt{136727} \pi\right)/12}\right)^2 1.2108}{2.05} =$$

$$0.590634 \exp\left(\frac{1}{12} \pi \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2 \lfloor \arg(136727-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (136727-z_0)^k z_0^{-k}}{k!}\right) \left(4 \left(\frac{1}{z_0}\right)^{\left\lfloor \arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} z_0^{1+\left\lfloor \arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2 + 4 \exp\left(\frac{1}{24} \pi \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2 \lfloor \arg(136727-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (136727-z_0)^k z_0^{-k}}{k!}\right) \left(\frac{1}{z_0}\right)^{\left\lfloor \arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} z_0^{1+\left\lfloor \arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2 + \exp\left(\frac{1}{12} \pi \left(\frac{1}{z_0}\right)^{1/2 \lfloor \arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2 \lfloor \arg(136727-z_0)/(2\pi)\rfloor} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (136727-z_0)^k z_0^{-k}}{k!}\right) \left(\frac{1}{z_0}\right)^{\left\lfloor \arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} z_0^{1+\left\lfloor \arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\right\rfloor} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k \left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2\right)$$

Note that, multiplying by 2 this expression, we obtain:

2*1.2108/2.05 ((((((2 sqrt(6/136727) e^((sqrt(136727) π)/24) + sqrt(6/136727) e^((sqrt(136727) π)/12)))))))^2

Input interpretation:

$$2 \times \frac{1.2108}{2.05} \left(2 \sqrt{\frac{6}{136727}} e^{1/24 \left(\sqrt{136727} \pi\right)} + \sqrt{\frac{6}{136727}} e^{1/12 \left(\sqrt{136727} \pi\right)}\right)^2$$

Open code

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Result:

- More digits

$6.28071... \times 10^{79}$

This result is very near to the value of length of a circle with radius equal to 1: 2π (multiple)

Series representations:

$$\frac{\left(2\left(2\sqrt{\frac{6}{136727}}\, e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\, e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^2\right)1.2108}{2.05} =$$

$$1.18127 \exp\left(\frac{1}{12}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (136\,727-z_0)^k z_0^{-k}}{k!}\right)$$
$$\left(4\sqrt{z_0}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136\,727}-z_0\right)^k z_0^{-k}}{k!}\right)^2+\right.$$
$$4\exp\left(\frac{1}{24}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (136\,727-z_0)^k z_0^{-k}}{k!}\right)$$
$$\sqrt{z_0}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2+$$
$$\exp\left(\frac{1}{12}\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (136\,727-z_0)^k z_0^{-k}}{k!}\right)\sqrt{z_0}^2$$
$$\left.\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2\right) \quad \text{for not } ((z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

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$$\frac{\left(2\left(2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^2\right)1.2108}{2.05}=1.18127$$

$$\exp\left(\frac{1}{12}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(136\,727-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\left(4\exp^2\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136\,727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136\,727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2+4\exp\left(\right.\right.$$
$$\left.\frac{1}{24}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(136\,727-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp^2\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2+$$
$$\exp\left(\frac{1}{12}\pi\exp\left(i\pi\left\lfloor\frac{\arg(136\,727-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k\,(136\,727-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\exp^2\left(i\pi\left\lfloor\frac{\arg\left(\frac{6}{136727}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2$$
$$\left.\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{6}{136727}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2\right)\quad\text{for }(x\in\mathbb{R}\text{ and }x<0)$$

$$\frac{\left(2\left(2\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/24}+\sqrt{\frac{6}{136727}}\,e^{\left(\sqrt{136727}\,\pi\right)/12}\right)^2\right)1.2108}{2.05}=$$

$$1.18127\exp\left(\frac{1}{12}\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136727-z_0)^k z_0^{-k}}{k!}\right)\left(4\left(\frac{1}{z_0}\right)^{\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\rfloor} z_0^{1+\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\rfloor}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2+\right.$$

$$4\exp\left(\frac{1}{24}\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136727-z_0)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\rfloor} z_0^{1+\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\rfloor}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2+$$

$$\left.\exp\left(\frac{1}{12}\pi\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor} z_0^{1/2+1/2\lfloor\arg(136727-z_0)/(2\pi)\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(136727-z_0)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\rfloor} z_0^{1+\lfloor\arg\left(\frac{6}{136727}-z_0\right)/(2\pi)\rfloor}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{6}{136727}-z_0\right)^k z_0^{-k}}{k!}\right)^2\right)$$

- $n!$ is the factorial function
- $(a)_n$ is the Pochhammer symbol (rising factorial)
- $\mathbb{R}$ is the set of real numbers
- $\arg(z)$ is the complex argument
- $\lfloor x\rfloor$ is the floor function
- i is the imaginary unit
- More information

We have

$$\begin{cases}\Theta=\dfrac{r_+-r_-}{4\alpha} & \text{“gravità di superficie”}\\ \phi=\dfrac{r_+Q}{\alpha} & \text{“potenziale elettrico”}\\ \Omega=\dfrac{a}{\alpha} & \text{“frequenza angolare”.}\end{cases}$$

Where **a** = J/M

From the formula of temperature and

$$\Theta = \frac{r_+ - r_-}{4\alpha}$$

that is the surface gravity, from our calculations, we obtain:

((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi)

Input interpretation:

$$\frac{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}{2\pi}$$

Open code

- Units »

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Result:

- More digits

$1.51541... \times 10^{-42}$

From which:

1/ (((((((((10^3 ((((((((((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi)))))))))^1/13))))))))

Input interpretation:

$$\frac{1}{10^3 \sqrt[13]{\frac{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}{2\pi}}}$$

Open code

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Result:

- Fewer digits
- More digits

1.6477158283216220606108224071415601414977900114636670780 31...

1.64771582832162206061082240714156014149779001146366 70

(3^3*2^3) + ((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi) * 10^45

Input interpretation:

$$3^3\times 2^3 + \frac{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}{2\pi}\times 10^{45}$$

Open code

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Result:

- More digits
  1731.41...

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

(((((((((3^3*2^3) + ((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi) * 10^45))))))))^1/3

Input interpretation:

$$\sqrt[3]{3^3 \times 2^3 + \frac{\frac{2.62561 \times 10^{40}}{4 \times 6.8938278721 \times 10^{80}}}{2\pi} \times 10^{45}}$$

Open code

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Result:

- More digits
  12.0079...

This result is very near to the value of black hole entropy 12,1904

2*(((((((((3^3*2^3) + ((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi) * 10^45))))))))^1/3

Input interpretation:

$$2\sqrt[3]{3^3 \times 2^3 + \frac{\frac{2.62561 \times 10^{40}}{4 \times 6.8938278721 \times 10^{80}}}{2\pi} \times 10^{45}}$$

Open code

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Result:

- More digits
  24.0158...

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

((((((((((3^3*2^3) + ((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi) * 10^45))))))))^1/15

Input interpretation:

$$\sqrt[15]{3^3\times 2^3+\frac{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}{2\pi}\times 10^{45}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643967830409512506779509641312779849901524429356232307605...

1.64396783040951250677950964131277984990152442935623 23

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{144+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{115+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{2+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{2778445344\pi}{5309558569}\approx 1.64396783040951250675039 1$$

$$\pi\ \text{root of}\ 7500x^3-58341x^2-44415x+38143\ \text{near}\ x=0.523291\approx$$

$$1.6439678304095125067782314$$

$$\frac{2}{11}\pi\tanh^{-1}\left(\frac{47507592}{50811905}\right)^2\approx 1.6439678304095125068627 1$$

1/2((((((((((3^3*2^3) + ((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi) * 10^45))))))))^1/15 + ((((((((3^3*2^3) + ((((2.62561*10^40)/(4*6.8938278721*10^80)))) / (2Pi) * 10^45))))))))^1/16

Input interpretation:

$$\frac{1}{2}\left(\sqrt[15]{3^3\times 2^3+\frac{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}{2\pi}\times 10^{45}}+\sqrt[16]{3^3\times 2^3+\frac{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}{2\pi}\times 10^{45}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.618821824011201751922356106893185357336301035323601051738...

1.6188218240112017519223561068931853573363010353236010

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

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{3236105\,\pi^2}{19729828}\approx 1.61882182401120166243$$

$$\frac{2(390\pi\pi! - 5068 - 535\pi + 71\pi^2)}{1085\pi} \approx 1.618821824011201751 87004$$

$$\frac{2183652937\pi}{4237741253} \approx 1.618821824011201751961162$$

Now, for:

For $j \gg \varepsilon$, $n \gg \varepsilon$

$$|\alpha_{jn\omega'}| = \left|(2\pi)^{-1} P_\omega^- \omega^{-\frac{1}{2}} \Gamma\left(1 - \frac{i\omega}{\kappa}\right) \varepsilon^{-\frac{1}{2}} (\omega')^{-\frac{1}{2}} \cdot \int_{j\varepsilon}^{(j+1)\varepsilon} \exp i\omega''(-2\pi n \varepsilon^{-1} + \kappa^{-1} \log \omega') d\omega''\right|$$

$$= \left|\pi^{-1} P_\omega^- \omega^{-\frac{1}{2}} \Gamma\left(1 - \frac{i\omega}{\kappa}\right) \varepsilon^{-\frac{1}{2}} (\omega')^{-\frac{1}{2}} z^{-1} \sin\tfrac{1}{2}\varepsilon z\right| \tag{2.25}$$

where $\omega = j\varepsilon$ and $z = \kappa^{-1} \log \omega' - 2\pi n \varepsilon^{-1}$. For wave-packets which reach $\mathscr{I}^+$ at

And

Thus the total number of particles created in the mode p_{jn} is

$$\Gamma_{jn}(\exp(2\pi\omega\kappa^{-1}) - 1)^{-1}. \tag{2.29}$$

We obtain, from (2.29):

gamma (1/12) 1/(((((((((((exp((((((((((2Pi * (0.9/13.12806*10^39) * 1/(6.8938278721*10^80) * 4*(13.12806*10^39)))))))))) - 1)))))))))))))

Input interpretation:

$$\Gamma\left(\frac{1}{12}\right) \times \frac{1}{\exp\left(2\pi \times \frac{0.9}{13.12806 \times 10^{39}} \times \frac{1}{6.8938278721 \times 10^{80}} \times 4 \times 13.12806 \times 10^{39}\right) - 1}$$

Open code

- $\Gamma(x)$ is the gamma function

Enlarge Data Customize A Plaintext Interactive

Result:

$\tilde{\infty}$

- $\tilde{\infty}$ is complex infinity

Decimal approximation:

- More digits

$3.50473... \times 10^{80}$

Now, from the extended result, we obtain:

11*33021.10 * (3.5047279483378629330683040683071769943835087931 2 × 10^80)^1.2108

Where 33021,10 is a result of a Ramanujan Mock Theta Function, and 1,2108 is the following Hausdorff dimension:

$$2\log_2\left(\frac{\sqrt[3]{27-3\sqrt{78}}+\sqrt[3]{27+3\sqrt{78}}}{3}\right),$$

or root of $2^x - 1 = 2^{(2-x)/2}$

Input interpretation:

$$11\times 33\,021.10\,(3.5047279483378629330683040683071769943835087931 2\times 10^{80})^{1.2108}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.21242... \times 10^{103}$

This result is practically equal to the value of SMBHs entropy contained within the cosmic event horizon 1,2 * 10^{103}

Now, we have also:

((33021.10 * (54+3/10)) * gamma (1/12) 1/((((((((((((exp((((((((((2Pi * (0.9/13.12806*10^39) * 1/(6.8938278721*10^80) * 4*(13.12806*10^39)))))))))) - 1)))))))))))))))

Where 33021,10 is a result of a Ramanujan Mock Theta Function (see next pages)

Input interpretation:

$$\left(33\,021.10\left(54+\frac{3}{10}\right)\right)\Gamma\left(\frac{1}{12}\right)\times\frac{1}{\exp\left(2\,\pi\times\frac{0.9}{13.12806\times 10^{39}}\times\frac{1}{6.8938278721\times 10^{80}}\times 4\times 13.12806\times 10^{39}\right)-1}$$

Open code

- $\Gamma(x)$ is the gamma function

Enlarge Data Customize A Plaintext Interactive

Result:

$\tilde{\infty}$

- $\tilde{\infty}$ is complex infinity

Decimal approximation:

- More digits

$6.28414... \times 10^{86}$

This result is practically equal to the value of Dark Matter entropy 6 * 10^{86} contained within the cosmic event horizon, moreover this value is a multiple very near to the length of a circle with radius equal to 1: 2π

Now, we have also:

(3.50472794833786293306830406830717699438350879312 × 10^80)^1/((1210/Pi)))

Input interpretation:

$$\sqrt[\frac{1210}{\pi}]{3.50472794833786293306830406830717699438350879312 \times 10^{80}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6185373378340964878000106955922150084109437442140...

1.6185373378340964878000106955922150084109437442140

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

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\text{root of } 3x^5 + 72x^4 - 900x^3 + 658x^2 + 294x + 1089 \text{ near } x = 1.61854 \approx$
1.6185373378340964879698

$\frac{3545187209\pi}{6881233958} \approx 1.6185373378340964877886$

$\text{root of } 5495x^4 - 2350x^3 - 6955x^2 - 5997x + 180 \text{ near } x = 1.61854 \approx$
1.61853733783409648780003518 8

And:

(89+55-34)+10^3 * (3.5047279483378 × 10^80)^1/((1210/Pi)))

Input interpretation:

$$(89 + 55 - 34) + 10^3 \sqrt[1210/\pi]{3.5047279483378 \times 10^{80}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  1728.537337834096...

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

(((((89+55-34)+10^3 * (3.5047279483378 × 10^80)^1/((1210/Pi)))))))^1/3

Input interpretation:

$$\sqrt[3]{(89 + 55 - 34) + 10^3 \sqrt[1210/\pi]{3.5047279483378 \times 10^{80}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  12.00124370867353...

This result is very near to the value of black hole entropy 12,1904

2 * (((((89+55-34)+10^3 * (3.5047279483378 × 10^80)^1/((1210/Pi)))))))^1/3

Input interpretation:

$$2\sqrt[3]{(89+55-34)+10^3 \sqrt[\frac{1210}{\pi}]{3.5047279483378\times 10^{80}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

24.00248741734707...

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

(((((89+55-34)+10^3 * (3.5047279483378 × 10^80)^1/((1210/Pi)))))))^1/15

Input interpretation:

$$\sqrt[15]{(89+55-34)+10^3 \sqrt[\frac{1210}{\pi}]{3.5047279483378\times 10^{80}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643785900578231062016108475602165619530352636234898442489...

1.643785900578231062016108475602165619530352636234898 4

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\frac{8}{3}\pi \sinh^{-1}\left(\frac{1991044}{4351179}\right)^2 \approx 1.64378590057823106886275$

π root of $22765x^3 + 8208x^2 + 5718x - 8500$ near $x = 0.523233$ $\approx$ 1.64378590057823106820130399

$-\frac{3337\,e!}{24} - \frac{649}{8} + \frac{171}{e} + \frac{901\,e}{4} \approx 1.64378590057823106605182$

Now:

For $j \gg \varepsilon$, $n \gg \varepsilon$

$$|\alpha_{jn\omega'}| = \left|(2\pi)^{-1} P_\omega^- \omega^{-\frac{1}{2}} \Gamma\left(1 - \frac{i\omega}{\kappa}\right) \varepsilon^{-\frac{1}{2}} (\omega')^{-\frac{1}{2}} \cdot \int_{j\varepsilon}^{(j+1)\varepsilon} \exp i\omega''(-2\pi n\varepsilon^{-1} + \kappa^{-1} \log\omega') d\omega''\right|$$

$$= \left|\pi^{-1} P_\omega^- \omega^{-\frac{1}{2}} \Gamma\left(1 - \frac{i\omega}{\kappa}\right) \varepsilon^{-\frac{1}{2}} (\omega')^{-\frac{1}{2}} z^{-1} \sin\tfrac{1}{2}\varepsilon z\right| \quad (2.25)$$

where $\omega = j\varepsilon$ and $z = \kappa^{-1}\log\omega' - 2\pi n\varepsilon^{-1}$. For wave-packets which reach $\mathscr{I}^+$ at

For a Schwarzchild black hole $\kappa = \frac{1}{4M}$

where $P_\omega^- \equiv P_\omega(2M)$ is the value of the radial function for P_ω on the past event horizon in the analytically continued Schwarzchild solution. The expression $\omega' = \omega$

where j and n are integers, $j \geqq 0$, $\varepsilon > 0$. For ε small these wave packets will have frequency $j\varepsilon$ and will be peaked around retarded time $u = 2\pi n\varepsilon^{-1}$ with width ε^{-1}.

We obtain the following interesting expressions:

(((((((1/Pi*2*13.12806*10^39 * (1/12)^-(0.5) * gamma * -(((1-(1/3*13.12806*10^39))))* [((((1/4)^(-0.5) * (1/12)^(-0.5))))]

Input interpretation:

$\frac{1}{\pi} \times 2 \times 13.12806 \times 10^{39} \left(\frac{1}{12}\right)^{-0.5} \gamma \times (-1)\left(1 - \frac{1}{3} \times 13.12806 \times 10^{39}\right) \times \frac{1}{\left(\frac{1}{4}\right)^{0.5}\left(\frac{1}{12}\right)^{0.5}}$

- γ is the Euler-Mascheroni constant

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

5.0665149048387062537691538592186306893769151907247351... × 10^{80}
5.066514904838706253769153859218630689376915190 72 × 10^{80}

(((((sin ((((1/8 *((((4*13.12806* (((((((((ln 1/12 - (8pi/5)))))))))) *
((((((((1/(((((((4*13.12806* ((((ln 1/12 - (8pi/5))))))))

Input interpretation:

$$\sin\left(\frac{1}{8}\left(4\times 13.12806\left(\log\left(\frac{1}{12}\right)-8\times\frac{\pi}{5}\right)\times\frac{1}{4\times 13.12806\left(\log\left(\frac{1}{12}\right)-8\times\frac{\pi}{5}\right)}\right)\right)$$

Open code

- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.1246747...

0.12467473338522768995744270871210846758783490564167 92

That is:

(((((sin ((((1/8 *((((4*13.12806*10^39* (((((((((ln 1/12 - (8pi/5)))))))))) *
((((((((1/(((((((4*13.12806*10^39* ((((ln 1/12 - (8pi/5))))))))

Input interpretation:

$$\sin\left(\frac{1}{8}\left(4\times 13.12806\times 10^{39}\left(\log\left(\frac{1}{12}\right)-8\times\frac{\pi}{5}\right)\times\frac{1}{4\times 13.12806\times 10^{39}\left(\log\left(\frac{1}{12}\right)-8\times\frac{\pi}{5}\right)}\right)\right)$$

Open code

- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

0.12467473338522768995744270871210846758783490564167925788 5...

Series representations:

- More

$$\sin\left(\frac{4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)}{\left(4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)\right)8}\right)=\sum_{k=0}^{\infty}\frac{(-1)^k\, 0.125^{1+2k}}{(1+2k)!}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sin\left(\frac{4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)}{\left(4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)\right)8}\right)=2\sum_{k=0}^{\infty}(-1)^k J_{1+2k}(0.125)$$

Open code

$$\sin\left(\frac{4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)}{\left(4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)\right)8}\right)=\sum_{k=0}^{\infty}\frac{(-1)^k\left(0.125-\frac{\pi}{2}\right)^{2k}}{(2k)!}$$

Integral representations:

$$\sin\left(\frac{4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)}{\left(4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)\right)8}\right)=0.125\int_0^1\cos(0.125\,t)\,dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sin\left(\frac{4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)}{\left(4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)\right)8}\right)=\frac{0.03125\sqrt{\pi}}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-0.00390625/s+s}}{s^{3/2}}\,ds \quad \text{for } \gamma>0$$

Open code

$$\sin\left(\frac{4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)}{\left(4\times 13.1281\left(\log\left(\frac{1}{12}\right)-\frac{8\pi}{5}\right)\right)8}\right)=\frac{0.03125\sqrt{\pi}}{i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{5.54518\,s}\,\Gamma(s)}{\Gamma\left(\frac{3}{2}-s\right)}\,ds$$
$$\text{for } 0<\gamma<1$$

0.124674733385227689957442 7*(((((((1/Pi*2*13.12806*10^39 * (1/12)^-(0.5) * gamma * -(((1-(1/3*13.12806*10^39))))* [((((1/4)^(-0.5) * (1/12)^(-0.5))))]

Input interpretation:

$$0.1246747333852276899574427\left(\frac{1}{\pi}\times 2\times 13.12806\times 10^{39}\left(\frac{1}{12}\right)^{-0.5}\gamma\times(-1)\left(1-\frac{1}{3}\times 13.12806\times 10^{39}\right)\times\frac{1}{\left(\frac{1}{4}\right)^{0.5}\left(\frac{1}{12}\right)^{0.5}}\right)$$

- γ is the Euler-Mascheroni constant

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$6.316663949530479431800669390023550306115211316661\,0197\ldots\times 10^{79}$

$6.3166639495304794318006693900235503061152113166 6\times 10^{79}$

(6.3166639495304794318 × 10^79)^1/((32^2+24*5)/Pi))

Input interpretation:

$$\sqrt[\frac{32^2+24\times 5}{\pi}]{6.3166639495304794318\times 10^{79}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6563186956284091421 59...

1.6563186956284091421 59

We note that, the result 1,656318... is practically equal to the 14th root of the following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164,2696$ i.e. 1,65578...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+\sqrt{505}}{8}}\right)^3} = 1,65578\ldots \Rightarrow$$

$$\Rightarrow \sqrt[\frac{32^2+24\times5}{\pi}]{6.3166639495304794318\times10^{79}}$$

$= 1.656318$

24*3 + 10^3 * (6.3166639495304794318 × 10^79)^1/((32^2+24*5)/Pi))

Input interpretation:

$$24\times3+10^3\sqrt[\frac{32^2+24\times5}{\pi}]{6.3166639495304794318\times10^{79}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1728.31869562840914215 9...

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

(((((24*3 + 10^3 * (6.3166639495304794318 × 10^79)^1/((32^2+24*5)/Pi)))))^1/3

Input interpretation:

$$\sqrt[3]{24\times 3+10^{3}\sqrt[\frac{32^{2}+24\times 5}{\pi}]{6.3166639495304794318\times 10^{79}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

12.000737676013970525180...

This result is very near to the value of black hole entropy 12,1904

2 * (((((24*3 + 10^3 * (6.3166639495304794318 × 10^79)^1/((32^2+24*5)/Pi)))))^1/3

Input interpretation:

$$2\sqrt[3]{24\times 3+10^{3}\sqrt[\frac{32^{2}+24\times 5}{\pi}]{6.3166639495304794318\times 10^{79}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

24.001475352027941050359...

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

(((((24*3 + 10^3 * (6.3166639495304794318 × 10^79)^1/((32^2+24*5)/Pi)))))^1/15

Input interpretation:

$$\sqrt[15]{24\times 3+10^{3}\sqrt[\frac{32^{2}+24\times 5}{\pi}]{6.3166639495304794318\times 10^{79}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6437720382919401759948...

1.6437720382919401759948

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{6+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{97+\cfrac{1}{3+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{641\,357\,815\,\pi}{1\,225\,769\,117} \approx 1.64377203829194017597538 7$$

$$\frac{7}{11}\,\pi\,\sinh^2\left(\frac{1\,591\,936}{1\,955\,973}\right) \approx 1.6437720382919401731983$$

$$\frac{20\sqrt{\frac{11\,429\,426}{17\,370\,077}}}{\pi^2} \approx 1.64377203829194018277 0$$

(6.3166639495304794318 × 10^79)^1/(1200/Pi)

Input interpretation:

$$\sqrt[\frac{1200}{\pi}]{6.3166639495304794318\times 10^{79}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.617771530518557825041...

1.617771530518557825041

This result is a very good approximation to the value of golden ratio

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{3+\cfrac{1}{92+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{48+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\text{root of } 32569x^3 - 18103x^2 - 73774x + 28831 \text{ near } x = 1.61777 \approx$

$1.61777153051855782504162958$

$\frac{19236038\pi}{37354963} \approx 1.61777153051855784590 6$

$\frac{2 + 75150\pi + 227\pi^2}{46894\pi} \approx 1.6177715305185578250 19706$

Now, we know that the electron velocity in the ground state is:

2,188745451993 * 10^6

and that:

From:

Black Holes
MSc in Quantum Fields and Fundamental Forces - Academic Year 2014/15
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The Schwarzschild metric (1916) is a solution to the vacuum Einstein equations $R_{\mu\nu} = 0$. It is given by

$$ds^2 = g_{\mu\nu}dx^\mu dx^\nu = -\left(1 - \frac{2M}{r}\right)dt^2 + \left(1 - \frac{2M}{r}\right)^{-1} dr^2 + r^2 d\Omega_2^2, \qquad (1.1)$$

where $0 < r < \infty$ is a radial coordinate and $d\Omega_2^2 = d\theta^2 + \sin^2\theta d\phi^2$ is the round metric on the two-sphere.

We now make a coordinate transformation from (t, r, θ, ϕ) to (v, r, θ, ϕ), i.e. we replace t by the coordinate v that labels ingoing radial null lines. The coordinates (v, r, θ, ϕ) are called *ingoing Eddington-Finkelstein (IEF) coordinates* and the line-element in IEF coordinates reads (exercise)

$$ds^2 = -\left(1 - \frac{2M}{r}\right)dv^2 + 2dvdr + r^2 d\Omega_2^2. \qquad (1.22)$$

This metric is perfectly regular at $r = 2M$ (i.e. it is non-degenerate: $\det g_{\mu\nu} \neq 0$). In fact, it is fine *everywhere* except at $r = 0$. We may therefore extend the range of

and:

[21, 22].) The operators $\boldsymbol{a}_i$ and $\boldsymbol{a}_i^\dagger$ have the natural interpretation as the annihilation and creation operators for ingoing particles i.e. for particles at past null infinity $\mathscr{I}^-$. Because massless fields are completely determined by their data on

To calculate the coefficients $\alpha_{\omega\omega'}$ and $\beta_{\omega\omega'}$, consider a solution p_ω propagating backwards from $\mathscr{I}^+$ with zero Cauchy data on the event horizon. A part $p_\omega^{(1)}$ of the solution p_ω will be scattered by the static Schwarzchild field outside the collapsing body and will end up on $\mathscr{I}^-$ with the same frequency ω. This will give a $\delta(\omega' - \omega)$ term in $\alpha_{\omega\omega'}$. The remainder $p_\omega^{(2)}$ of p_ω will enter the collapsing body where it will be partly scattered and partly reflected through the centre, eventually emerging to $\mathscr{I}^-$. It is this part $p_\omega^{(2)}$ which produces the interesting effects. Because the retarded time coordinate u goes to infinity on the event horizon, the surfaces of constant phase of the solution p_ω will pile up near the event horizon (Fig. 4). To an observer on the collapsing body the wave would seem to have a very large blue-shift. Because its effective frequency was very high, the wave would propagate by geometric optics through the centre of the body and out on $\mathscr{I}^-$. On $\mathscr{I}^-$ $p_\omega^{(2)}$ would have an infinite number of cycles just before the advanced time $v = v_0$ where v_0 is the latest time that a null geodesic could leave $\mathscr{I}^-$, pass through the centre of the body and escape to $\mathscr{I}^-$ before being trapped by the event horizon. One can estimate the form of $p_\omega^{(2)}$ on $\mathscr{I}^-$ near $v = v_0$ in the following way. Let x be a point on the event horizon outside the matter and let l^a be a null vector tangent to the horizon. Let n^a be the future-directed null vector at x which is directed radially inwards and normalized so that $l^a n_a = -1$. The vector $-\varepsilon n^a$ (ε small and positive) will connect the point x on the event horizon with a nearby null surface of constant retarded time u and therefore with a surface of constant phase of the solution $p_\omega^{(2)}$. If the vectors l^a and n^a are parallelly transported along the null geodesic γ through x which generates the horizon, the vector $-\varepsilon n^a$ will always connect the event horizon with the same surface of constant phase of $p_\omega^{(2)}$.

$$p_\omega^{(2)} \sim (2\pi)^{-\frac{1}{2}} \omega^{-\frac{1}{2}} r^{-1} P_\omega^- \exp\left(-i\frac{\omega}{\kappa}\left(\log\left(\frac{v_0 - v}{CD}\right)\right)\right) \tag{2.18}$$

where $P_\omega^- \equiv P_\omega(2M)$ is the value of the radial function for P_ω on the past event horizon in the analytically continued Schwarzchild solution. The expression (2.18) for $p_\omega^{(2)}$ is valid only for $v_0 - v$ small and positive. At earlier advanced times the amplitude will be different and the frequency measured with respect to v, will approach the original frequency ω.

We have that for: r = 2.62561 × 10^40; ω = 6.62606957 * 10^{-34}; κ = 1 / 4M; $P_\omega^- = P_\omega(2M) = 2M$(as a radial coordinate r); CD = 1 and $v_0 - v = v$; we obtain, from (2.18):

(2Pi)^(-0.5) * (6.62606957 * 10^-34)^(-0.5) * 1/(2.62561*10^40) * (2*13.12806*10^39)* exp(((((((((-6.62606957 * 10^-34i)*((4*13.12806*10^39))) * ln(2.188745451993 * 10^6)))))))))))

Input interpretation:

$$\frac{1}{(2\pi)^{0.5}\left(\frac{6.62606957}{10^{34}}\right)^{0.5}} \frac{1}{2.62561\times 10^{40}} (2\times 13.12806\times 10^{39}) \exp\left(\left(-\frac{6.62606957\,i}{10^{34}}(4\times 13.12806\times 10^{39})\right)\log(2.188745451993\times 10^{6})\right)$$

Open code

- $\log(x)$ is the natural logarithm
- i is the imaginary unit

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Result:

- More digits

$-1.49514\ldots\times 10^{16} - 4.08053\ldots\times 10^{15}\, i$

Polar coordinates:

$r = 1.54982\times 10^{16}$ (radius), $\theta = -164.735°$ (angle)

Open code

(((((((2Pi)^(-0.5) * (6.62606957 * 10^-34)^(-0.5) * 1/(2.62561*10^40) * (2*13.12806*10^39)* exp((((((((-6.62606957 * 10^-34i)*((4*13.12806*10^39))) * ln(2.188745451993 * 10^6)))))))))))^1/5

Input interpretation:

$$\left(\left(\frac{1}{2.62561\times 10^{40}}(2\times 13.12806\times 10^{39}) \exp\left(\left(-\frac{6.62606957\,i}{10^{34}}(4\times 13.12806\times 10^{39})\right)\log(2.188745451993\times 10^{6})\right)\right) \Big/ \left((2\pi)^{0.5}\left(\frac{6.62606957}{10^{34}}\right)^{0.5}\right)\right) \hat{}\ (1/5)$$

Open code

- $\log(x)$ is the natural logarithm
- i is the imaginary unit

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Result:

- More digits

$1451.81\ldots - 940.904\ldots\, i$

Polar coordinates:

$r = 1730.04$ (radius), $\theta = -32.9469°$ (angle)

1730.04

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

Possible closed forms:

- More

$1730 \approx 1730.000000$

$\frac{1}{10} \pi \cosh^2(5) \approx 1730.11166$

$880 \mathcal{P}_{pen} \approx 1730.034448$

- $\cosh(x)$ is the hyperbolic cosine function
- $\mathcal{P}_{pen}$ is the pentanacci constant

((((((2Pi)^(-0.5) * (6.62606957 * 10^-34)^(-0.5) * 1/(2.62561*10^40) * (2*13.12806*10^39)* exp((((((((-6.62606957 * 10^-34i)*((4*13.12806*10^39))) * ln(2.188745451993 * 10^6))))))))^1/5))))))))^1/3

Input interpretation:

$$\left(\left(\left(\frac{1}{2.62561\times 10^{40}}\left(2\times 13.12806\times 10^{39}\right)\exp\left(\left(-\frac{6.62606957\,i}{10^{34}}\left(4\times 13.12806\times 10^{39}\right)\right)\log\left(2.188745451993\times 10^{6}\right)\right)\right)\Big/\left((2\pi)^{0.5}\left(\frac{6.62606957}{10^{34}}\right)^{0.5}\right)\right)\wedge(1/5)\right)\wedge(1/3)$$

Open code

- $\log(x)$ is the natural logarithm
- i is the imaginary unit

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Result:

- More digits

$11.7849\ldots - 2.28697\ldots i$

Polar coordinates:

$r = 12.0047$ (radius), $\theta = -10.9823°$ (angle)

Open code

12.0047

This result is very near to the value of black hole entropy 12,1904

2((((((2Pi)^(-0.5) * (6.62606957 * 10^-34)^(-0.5) * 1/(2.62561*10^40) * (2*13.12806*10^39)* exp((((((((-6.62606957 * 10^-34i)*((4*13.12806*10^39))) * ln(2.188745451993 * 10^6))))))))^1/5))))))))^1/3

Input interpretation:

$$2\left(\left(\left(\frac{1}{2.62561\times 10^{40}}\left(2\times 13.12806\times 10^{39}\right)\exp\left(\left(-\frac{6.62606957\,i}{10^{34}}\left(4\times 13.12806\times 10^{39}\right)\right)\log\left(2.188745451993\times 10^{6}\right)\right)\right)\Big/\left((2\pi)^{0.5}\left(\frac{6.62606957}{10^{34}}\right)^{0.5}\right)\right)\wedge(1/5)\right)\wedge(1/3)$$

Open code

- $\log(x)$ is the natural logarithm
  - i is the imaginary unit

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Result:

- More digits

23.5697... −
4.57394... i

Polar coordinates:

$r = 24.0094$ (radius), $\theta = -10.9823°$ (angle)

Open code

24.0094

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

((((((2Pi)^(-0.5) * (6.62606957 * 10^-34)^(-0.5) * 1/(2.62561*10^40) * (2*13.12806*10^39)* exp((((((((-6.62606957 * 10^-34i)*((4*13.12806*10^39))) * ln(2.188745451993 * 10^6))))))))^1/5))))))))^1/15

Input interpretation:

$$\left(\left(\left(\frac{1}{2.62561\times10^{40}}(2\times13.12806\times10^{39})\exp\left(\left(-\frac{6.62606957\,i}{10^{34}}(4\times13.12806\times10^{39})\right)\log\left(2.188745451993\times10^{6}\right)\right)\right)\Big/\left((2\pi)^{0.5}\left(\frac{6.62606957}{10^{34}}\right)^{0.5}\right)\right)\hat{}\,(1/5)\right)\hat{}\,(1/15)$$

Open code

- $\log(x)$ is the natural logarithm
  - i is the imaginary unit

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Result:

- More digits

1.64267... −
0.0630036... i

Polar coordinates:

$r = 1.64388$ (radius), $\theta = -2.19646°$ (angle)

Open code

1.64388

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}$$

Open code

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Possible closed forms:

- More

$\frac{120}{73} \approx 1.643835616$

$\frac{45\pi}{86} \approx 1.643856621$

$\frac{4\sqrt{\frac{5}{3}}}{\pi} \approx 1.64374518$

From this last formula, with the third closed form, we can to obtain also a very good approximation to π. Indeed, we have:

(4sqrt(5/3) / [((((((2Pi)^(-0.5) * (6.626069 * 10^-34)^(-0.5) * 1/(2.62561*10^40) * (2*13.12806*10^39)* exp(((((-6.626069 * 10^-34i)*((4*13.12806*10^39))) * ln(2.1887454519 * 10^6))))))^1/5)))))^1/15)]

Input interpretation:

$$4\times\left(\sqrt{\frac{5}{3}}\right)/\left(\left(\left(\left(\frac{1}{2.62561\times10^{40}}\left(2\times13.12806\times10^{39}\right)\exp\left(\left(-\frac{6.626069\,i}{10^{34}}\left(4\times13.12806\times10^{39}\right)\log\left(2.1887454519\times10^{6}\right)\right)\right)\right)/\left((2\pi)^{0.5}\left(\frac{6.626069}{10^{34}}\right)^{0.5}\right)\right)^{\wedge}(1/5)\right)^{\wedge}(1/15)\right)$$

Open code

- $\log(x)$ is the natural logarithm
- i is the imaginary unit

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Result:

- More digits
  3.1386072523864963972495593637536878229078622628502229540... − 0.13082655987048263266335707960510786645214239534570242667... i

Open code

Polar coordinates:

$r = 3.14133$ (radius), $\theta = -2.38688°$ (angle)

Continued fraction:

- Linear form

$$3+\cfrac{1}{7+\cfrac{1}{13+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}$$

Open code

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Possible closed forms:

- More

$\pi \approx 3.14159265$

$\sqrt[3]{31} \approx 3.141380652$

$\frac{289}{92} \approx 3.141304347$

This result 3.14133... is a very good approximation to π.

Now, from:

Charged and rotating AdS black holes and their CFT duals
S.W. Hawking and H.S. Reall† - https://arxiv.org/abs/hep-th/9908109v2

We have:

The AdS/CFT correspondence relates the worldvolume theory of N M2-branes in the large N limit to eleven dimensional supergravity on S^7. Four dimensional Kerr-AdS black holes are expected to be dual to the worldvolume CFT in a rotating three dimensional Einstein universe. For completeness we present the free CFT results for this case. The CFT is a free supersingleton field theory [31]. There are eight real scalar fields and eight Majorana spin-1/2 fields. The energy levels of these fields are $\omega = j + 1/2$ where $j = 0, 1, \ldots$ for the scalars and $j = 1/2, 3/2, \ldots$ for the fermions [32]. The partition functions can be evaluated

Thus the partition function for the free CFT of an M2-brane is

$$\log Z = 8 \sum_{n\,\mathrm{odd}} \frac{\cosh(\beta n/2)}{n \sinh(\beta n(1-\Omega)/2)\sinh(\beta n(1+\Omega)/2)}. \qquad (2.34)$$

We have also:

$$\log Z \approx \frac{16}{\beta(1-\Omega^2)} \sum_{n\,\mathrm{odd}} \frac{1}{n^2 \sinh(\beta n/2)}. \qquad (2.38)$$

The divergence is of the same form as that obtained from the bulk supergravity action in the limit $|a| \to 1$ [11].

From (2.38) we obtain, for β = 0.58; Ω = $0.637^{1/6}$:

(((((16* 1/(((0.58*(1-(((0.637)^1/6))^2)))))) sum 1 / (k^2 sinh(0.58/2k)), k = 1 to infinity

Input interpretation:

$$\left(16 \times \frac{1}{0.58\left(1-\sqrt[6]{0.637}^{\,2}\right)}\right) \sum_{k=1}^{\infty} \frac{1}{k^2 \sinh\left(\frac{0.58}{2}\,k\right)}$$

- $\sinh(x)$ is the hyperbolic sine function

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Result:

792.136

792.136

From (2.34), we obtain:

sum 1/((ksinh(0.58k((1-0.637^(1/6))/2))sinh(0.58k((1+0.637^(1/6))/2))))), k = 1 to infinity

Infinite sum:

$$\sum_{k=1}^{\infty} \frac{1}{k \sinh\left(\frac{1}{2} \times 0.58\left(1-\sqrt[6]{0.637}\right)k\right)\sinh\left(\frac{1}{2} \times 0.58\left(1+\sqrt[6]{0.637}\right)k\right)} = 92.7062$$

Open code

- $\sinh(x)$ is the hyperbolic sine function

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Convergence tests:

By the comparison test, the series converges.

sum (cosh(0.58/2k), k = 1 to infinity

Input interpretation:

$$\sum_{k=1}^{\infty} \cosh\left(\frac{0.58\,k}{2}\right)$$

- $\cosh(x)$ is the hyperbolic cosine function

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Result:

$$\sum_{k=1}^{\infty} \cosh\left(\frac{0.58\,k}{2}\right) \quad \text{(sum diverges)}$$

- $\cosh(x)$ is the hyperbolic cosine function

Convergence tests:

By the limit test, the series diverges.

Partial sum formula:

$$\sum_{k=1}^{n} \cosh\left(\frac{0.58\,k}{2}\right) \approx 0.5\,(6.87244 \sinh(0.29\,(n+0.5)) - 1)$$

0.5(6.87244 sinh(0.29(n+0.5))-1)

Input interpretation:

$$0.5\,(6.87244 \sinh(0.29\,(n+0.5)) - 1)$$

Values:

- More

n	1	2	3	4	5
$0.5\,(6.87244 \sinh(0.29\,(n+0.5)) - 1)$	1.04234	2.21531	3.61824	5.36995	7.61879

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Alternate forms:

- More

$$3.43622 \sinh(0.29\,n + 0.145) - 0.5$$

Open code

$$3.43622\,(\sinh(0.29\,(n+0.5)) - 0.145509)$$

Open code

$$3.43622 \sinh(0.29\,(n+0.5)) - 0.5$$

Open code

Real root:

- Step-by-step solution

$$n \approx 3.03817 \times 10^{-7}$$

Open code

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Roots:

- Approximate forms
- Step-by-step solution

$$n = \frac{1}{58}\,i\left(400\,\pi\,m + 29\,i - 200\,i \sinh^{-1}\left(\frac{25\,000}{171\,811}\right)\right), \quad m \in \mathbb{Z}$$

Open code

$$n = \frac{1}{58} i \left(400 \pi m + 200 \pi + 29 i + 200 i \sinh^{-1}\left(\frac{25000}{171811}\right)\right), \quad m \in \mathbb{Z}$$

Periodicity:

- Approximate form

periodic in n with period $\frac{200 i \pi}{29}$

Open code

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Series expansion at n = 0:

$$-3.05943 \times 10^{-7} + 1.007 n + 0.021025 n^2 + 0.0141148 n^3 + 0.00014735 n^4 + O(n^5)$$

(Taylor series)

Open code

- Big-O notation

Series expansion at n = ∞:

$$3.43622 \sinh(0.29 n + 0.145) - 0.5$$

Open code

Derivative:

- Step-by-step solution

$$\frac{d}{dn}(0.5 (6.87244 \sinh(0.29 (n + 0.5)) - 1)) = 0.996504 \cosh(0.29 n + 0.145)$$

Open code

- $\cosh(x)$ is the hyperbolic cosine function

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Indefinite integral:

$$\int 0.5 (6.87244 \sinh(0.29 (n + 0.5)) - 1) \, dn = -0.5 n + 1.72414 \sinh(0.29 n) + 11.9738 \cosh(0.29 n) + \text{constant}$$

For n = 4, we obtain:

8 * 5.36995 * sum 1/((ksinh(0.58k((1-0.637^(1/6))/2))sinh(0.58k((1+0.637^(1/6))/2))))), k = 1 to infinity

Input interpretation:

$$8 \times 5.36995 \sum_{k=1}^{\infty} \frac{1}{k \sinh\left(0.58 k \left(\frac{1}{2}\left(1 - \sqrt[6]{0.637}\right)\right)\right) \sinh\left(0.58 k \left(\frac{1}{2}\left(1 + \sqrt[6]{0.637}\right)\right)\right)}$$

- $\sinh(x)$ is the hyperbolic sine function

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Result:

3982.62

5.36995 * sum 1/((ksinh(0.58k((1-0.637^(1/6))/2))sinh(0.58k((1+0.637^(1/6))/2))))), k = 1 to infinity

Input interpretation:

$$5.36995 \sum_{k=1}^{\infty} \frac{1}{k \sinh\left(0.58\, k \left(\frac{1}{2}\left(1-\sqrt[6]{0.637}\right)\right)\right) \sinh\left(0.58\, k \left(\frac{1}{2}\left(1+\sqrt[6]{0.637}\right)\right)\right)}$$

- $\sinh(x)$ is the hyperbolic sine function

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Result:

497.828

497.828

From Ramanujan formula for p(20.56) ≈ 21, we obtain:

(((1/(4*20.56*sqrt(3))) * exp((((Pi*((((sqrt(((2*20.56)/3)))))

Input:

$$\frac{1}{4\times 20.56\sqrt{3}} \exp\left(\pi \sqrt{\frac{2\times 20.56}{3}}\right)$$

Open code

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Result:

- More digits

789.988…

Series representations:

- More

$$\frac{\exp\left(\pi \sqrt{\frac{2\times 20.56}{3}}\right)}{4\times 20.56\sqrt{3}} = \frac{0.0121595 \exp\left(\pi \sqrt{12.7067} \sum_{k=0}^{\infty} e^{-2.54213\, k} \binom{\frac{1}{2}}{k}\right)}{\sqrt{2} \sum_{k=0}^{\infty} 2^{-k} \binom{\frac{1}{2}}{k}}$$

Open code

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$$\frac{\exp\left(\pi \sqrt{\frac{2\times 20.56}{3}}\right)}{4\times 20.56\sqrt{3}} = \frac{0.0121595 \exp\left(\pi \sqrt{12.7067} \sum_{k=0}^{\infty} \frac{(-0.0786988)^k \left(-\frac{1}{2}\right)_k}{k!}\right)}{\sqrt{2} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{2}\right)^k \left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

$$\frac{\exp\left(\pi \sqrt{\frac{2\times 20.56}{3}}\right)}{4\times 20.56\sqrt{3}} = \frac{0.0121595 \exp\left(\pi \sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (13.7067-z_0)^k z_0^{-k}}{k!}\right)}{\sqrt{z_0} \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}}$$

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

From Ramanujan formula for p(18.56) ≈ 19, we obtain:

(((1/(4*18.56*sqrt(3))) * exp((((Pi*((((sqrt(((2*18.56)/3)))))

Input:

$$\frac{1}{4\times 18.56\sqrt{3}}\exp\left(\pi\sqrt{\frac{2\times 18.56}{3}}\right)$$

Open code

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Result:

- More digits

489.889...

Series representations:

- More

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 18.56}{3}}\right)}{4\times 18.56\sqrt{3}} = \frac{0.0134698\exp\left(\pi\sqrt{11.3733}\sum_{k=0}^{\infty} e^{-2.43127k}\binom{\frac{1}{2}}{k}\right)}{\sqrt{2}\sum_{k=0}^{\infty} 2^{-k}\binom{\frac{1}{2}}{k}}$$

Open code

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$$\frac{\exp\left(\pi\sqrt{\frac{2\times 18.56}{3}}\right)}{4\times 18.56\sqrt{3}} = \frac{0.0134698\exp\left(\pi\sqrt{11.3733}\sum_{k=0}^{\infty}\frac{(-0.087925)^k\left(-\frac{1}{2}\right)_k}{k!}\right)}{\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

$$\frac{\exp\left(\pi\sqrt{\frac{2\times 18.56}{3}}\right)}{4\times 18.56\sqrt{3}} = \frac{0.0134698\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(12.3733-z_0)^k z_0^{-k}}{k!}\right)}{\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(3-z_0)^k z_0^{-k}}{k!}}$$

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

We note that the two results, concerning the partition functions (eqs. 2.34 and 2.38)

792,136 and 497,828 are very closed to the two results regarding the Hardy-Ramanujan partition formula for p(19) and p(21), i.e., 789,988 and 489,889. We note that for to obtain the above results, n is equal to 18,56 and 20,56, that are good approximations to the numbers 19 and 21.

Now, we observe that, for c = 24 and c = 48, the (holomorphic) partition functions read

$$Z_{24}(\tau) = j(\tau) - 744$$
$$= q^{-1} + 196884\,q + 21493760\,q^2 + 864299970\,q^3 + 20245856256\,q^4 + \dots, \quad (1.5)$$

where j(τ) is the modular j-function and $q = e^{2\pi i\tau}$. The partition function in (1.5) defines a very special theory among the 71 holomorphic CFTs believed to exist at c = 24. Note that:

ln(864299970) = 20,577430454012695912396758411399, a value very near to 20.56, utilized for the calculation of p(21).

While, for 18.56, we note that:

(((ln(302198519÷2) + ln(86645620))) / 2 = 18,555392263251482338584975642891,

where 302198519 and 86645620 are values concerning some coefficients of Z(τ) modular j-invariant (or modular j-function).

Note that, 497,828 and 792,136 are very near to the rest mass of the Kaon meson, that is equal to 497.614±0.024, and to the rest mass of the Omega meson, that is equal to 782.65±0.12 and to the scalar meson $K*_0(700)$ Breit-Wigner Mass, that is 824 ±30 (lower value 794) OUR AVERAGE, or 797 ±19 (i.e. 797)

Now, we have:

we introduce the stringy parameters. The five dimensional Newton constant is related to the ten dimensional one by $1/G_5 = \pi^3/G_{10}$, where the numerator is simply the volume of the internal S^5. We are still using units for which the AdS length scale is unity, which means that $\lambda^{1/4} l_s = 1$ when we appeal to the AdS/CFT correspondence. The ten-dimensional Newton constant is related to the CFT parameters by $G_{10} = \pi^4/(2N^2)$ so $G_5 = \pi/(2N^2)$. The supergravity action can then be written

Notable examples are *d* = 4, N = 4 supersymmetric Yang–Mills theory, which is dual to Type IIB string theory on $AdS_5 \times S^5$. In our case we take N = 4.

For N = 4, G_5 = Pi / 32; Φ = 1 and $r_+ = 2.62561 * 10^{40}$

The action I of the black hole relative to AdS is [12]

$$I = \frac{\pi}{8G_5}\beta(r_+^2(1-\Phi(r_+)^2) - r_+^4) \quad (3.11)$$

We obtain, from (3.11) with minus sign:

-Pi/(8*Pi / 32) * 0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))

Input interpretation:

$$-\frac{\pi}{8\times\frac{\pi}{32}}\times 0.58\,((2.62561\times10^{40})^2\,(1-2.62561\times10^{40})^2-(2.62561\times10^{40})^4)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

8.39863×10^{121}

Scientific notation:

- More digits
  $8.398633577258719183999999999999999999999998400631933672...\times10^{121}$

-Pi/(8*Pi / 32) * 0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))*Pi

Input interpretation:

$$-\frac{\pi}{8\times\frac{\pi}{32}}\times 0.58\,((2.62561\times10^{40})^2\,(1-2.62561\times10^{40})^2-(2.62561\times10^{40})^4)\,\pi$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $2.63851...\times10^{122}$

This result is practically equal to the value of total entropy of Cosmic Event Horizon

Calculating the square root, we also obtain:

((((((-Pi/(8*Pi / 32) * 0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))*Pi)))))))^1/2

Input interpretation:

$$\sqrt{\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 0.58\,((2.62561\times10^{40})^2\,(1-2.62561\times10^{40})^2-(2.62561\times10^{40})^4)\right)\pi}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.62435... \times 10^{61}$

This result is an evident multiple of a golden number in the range of golden ratio value.

Note that, from this formula, we can to obtain also the size of the Monster Group. Indeed:

1/(2*10^7) * ((((((-Pi/(8*Pi / 32) * 0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))*Pi)))))))^1/2

Input interpretation:

$$\frac{1}{2\times 10^7}\sqrt{\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 0.58\left((2.62561\times 10^{40})^2\left(1-2.62561\times 10^{40}\right)^2-\left(2.62561\times 10^{40}\right)^4\right)\right)\pi}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$8.12174... \times 10^{53}$

Comparisons:

≈ the size of the Monster group (≈ 8.1×10^{53})

And:

(((((((((((((-Pi/(8*Pi / 32) * 0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))*Pi)))))))^1/2))))))))^1/12 * ((12^2+12)/(10^2)) + 89

Input interpretation:

$$\sqrt[12]{\sqrt{\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 0.58\left((2.62561\times 10^{40})^2\left(1-2.62561\times 10^{40}\right)^2-\left(2.62561\times 10^{40}\right)^4\right)\right)\pi}}\times\frac{12^2+12}{10^2}+89$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.96884... \times 10^5$

This result 196884 is a term that is part of the fundamental Fourier expansion of the normalized J-invariant:

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

From the inverse formula of (3,11), we can to obtain:

-(8.3986335772587191839999999999999999999999998400631933672 × 10^121 * 0.78539816339744830961566084581988) / ((((((((0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4))))))))))

Input interpretation:

$$-(((8.3986335772587191839999999999999999999999998400631933672 \times 10^{121}) \times 0.78539816339744830961566084581988) / (0.58 ((2.62561 \times 10^{40})^2 (1 - 2.62561 \times 10^{40})^2 - (2.62561 \times 10^{40})^4)))$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$\tilde{\infty}$

- $\tilde{\infty}$ is complex infinity

Decimal approximation:

- More digits

3.1415926535897932384626433832795199999999999999999999970075...

Open code

3.1415926535897932384626433832795199999999999999999999970075

Continued fraction:

- Linear form

$$3 + \cfrac{1}{7 + \cfrac{1}{15 + \cfrac{1}{1 + \cfrac{1}{292 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{1 + \cfrac{1}{14 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\pi \approx 3.14159265358979323846264338327950 2884$

$\log(\mathcal{G}_{Ge}) \approx 3.14159265358979323846264338327950 2884$

$\sqrt{6\,\zeta(2)} \approx 3.14159265358979323846264338327950 2884$

Furthermore, we have also:

2 * -(8.398633577258719 × 10^121 * 0.785398163397448) / (((((((0.58 * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4))))))))))

Input interpretation:

$$2\left(-\frac{(8.398633577258719\times10^{121})\times0.785398163397448}{0.58\left((2.62561\times10^{40})^2\,(1-2.62561\times10^{40})^2-(2.62561\times10^{40})^4\right)}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$\tilde{\infty}$

- $\tilde{\infty}$ is complex infinity

Decimal approximation:

- More digits

6.2831853071795838623459297413006178506852100952860037522 50...

Open code

6.28318530717958386234592974130061785068521009528600375225 0

Continued fraction:

- Linear form

$$6+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{146+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\sqrt[3]{\frac{1}{5}(391 - 1763 e + 806 \pi + 4486 \log(2))} \approx 6.283185307179583816353$$

$$\text{root of } 453 x^3 - 2665 x^2 - 11504 x + 65125 \text{ near } x = 6.28319 \approx 6.283185307179583855663$$

$$\frac{1}{\text{root of } 65125 x^3 - 11504 x^2 - 2665 x + 453 \text{ near } x = 0.159155} \approx 6.283185307179583855663$$

Or:

Input interpretation:

6.283185307179583

Open code

6.283185307179583

Possible closed forms:

- More

$2\pi \approx 6.28318530717958864769$

Enlarge Data Customize A Plaintext Interactive

$\frac{1}{p_A} \approx 6.28318530717958864769$

$2\sqrt{6\zeta(2)} \approx 6.28318530717958864769$

This result is equal to the length of a circle with radius equal to 1: 2π

This last result, which concerns the action of a Reissner-Nordstrom-AdS black hole in G_5, reinforces the vision that the imprint of very different, perhaps all, the structures of the cosmos (black holes, stars, galaxies, planets. ..) is the circumference. Furthermore, from the equations that we have developed, we always find solutions with values equal to golden numbers or, just, to the golden ratio. This allows us to predict in an ever more convincing way, that the universe is the product of the infinite ways in which π and ϕ are manifested and concretized in the marvelous varieties of which the multiverse is studded.

Now, from (3.12):

$$\beta = \frac{2\pi r_+}{1 - \Phi(r_+)^2 + 2r_+^2}.$$

We obtain:

(2Pi*2.62561*10^40) / (((1-(2.62561*10^40)^2+2*(2.62561*10^40)^2))

Input interpretation:

$$\frac{2\pi\times 2.62561\times 10^{40}}{1-(2.62561\times 10^{40})^2+2(2.62561\times 10^{40})^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.39304\ldots\times 10^{-40}$

(((((1/(((((2Pi*2.62561*10^40) / (((1-(2.62561*10^40)^2+2*(2.62561*10^40)^2))))))))^1/3

Input interpretation:

$$\sqrt[3]{\frac{1}{\frac{2\pi\times 2.62561\times 10^{40}}{1-(2.62561\times 10^{40})^2+2(2.62561\times 10^{40})^2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$1.6107078791561146741886837093545784297119265995199574\ldots\times 10^{13}$

$1.61070787915611467418868370935457842971192659951\times 10^{13}$

(((((1/(((((2Pi*2.62561*10^40) / (((1-(2.62561*10^40)^2+2*(2.62561*10^40)^2))))))))^1/3 * 1/10^10 + 27*4 + 8

Input interpretation:

$$\sqrt[3]{\frac{1}{\frac{2\pi\times 2.62561\times 10^{40}}{1-(2.62561\times 10^{40})^2+2(2.62561\times 10^{40})^2}}}\times\frac{1}{10^{10}}+27\times 4+8$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1726.71\ldots$

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

((((((((((1/(((((2Pi*2.62561*10^40) / (((1-(2.62561*10^40)^2+2*(2.62561*10^40)^2))))))))))^1/3 * 1/10^10 + 27*4 + 8))))))))))^1/3

Input interpretation:

$$\sqrt[3]{\sqrt[3]{\frac{1}{\frac{2\pi\times 2.62561\times 10^{40}}{1-(2.62561\times 10^{40})^2+2\,(2.62561\times 10^{40})^2}}}\times\frac{1}{10^{10}}+27\times 4+8}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  11.9970...

This result is very near to the value of black hole entropy 12,1904

2*((((((((((1/(((((2Pi*2.62561*10^40) / (((1-(2.62561*10^40)^2+2*(2.62561*10^40)^2))))))))))^1/3 * 1/10^10 + 27*4 + 8))))))))))^1/3

Input interpretation:

$$2\,\sqrt[3]{\sqrt[3]{\frac{1}{\frac{2\pi\times 2.62561\times 10^{40}}{1-(2.62561\times 10^{40})^2+2\,(2.62561\times 10^{40})^2}}}\times\frac{1}{10^{10}}+27\times 4+8}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  23.9940...

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

((((((((((1/(((((2Pi*2.62561*10^40) / (((1-(2.62561*10^40)^2+2*(2.62561*10^40)^2))))))))))^1/3 * 1/10^10 + 27*4 + 8))))))))))^1/15

Input interpretation:

$$\sqrt[15]{\sqrt[3]{\frac{1}{\frac{2\pi\times 2.62561\times 10^{40}}{1-(2.62561\times 10^{40})^2+2(2.62561\times 10^{40})^2}}}\times\frac{1}{10^{10}}+27\times 4+8}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643669859320177518437090594238055353777057356692880322562...

1.64366985932017751843709059423805535377705735669288 03

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{16+\cfrac{1}{12+\cfrac{1}{4+\cfrac{1}{30+\cfrac{1}{1+\cfrac{1}{27+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{29+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{778\,095\,317\,\pi}{1\,487\,195\,569} \approx 1.64366985932017751852651$$

π root of $2580\,x^4 - 6500\,x^3 - 4680\,x^2 + 2098\,x + 921$ near $x = 0.523196$ $\approx$ 1.64366985932017751842825 3

$$\frac{2\,(-350+124\,\pi+69\,\pi^2)}{337-290\,\pi+147\,\pi^2} \approx 1.64366985932017751874142$$

Now:

The action I of the black hole relative to AdS is [12]

$$I = \frac{\pi}{8G_5}\beta(r_+^2(1-\Phi(r_+)^2) - r_+^4) \tag{3.11}$$

with the previous calculated value of β from eq. (3.12), we obtain, from the eq. (3.11):

-Pi/(8*Pi / 32) * (2.39304*10^-40) * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))

Input interpretation:

$$-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}\left((2.62561\times 10^{40})^2\,(1-2.62561\times 10^{40})^2-(2.62561\times 10^{40})^4\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

34 652 182 923 660 698 889 791 999 999 999 999 999 999 340 111 765 957 992 640 ·.
000 000 000 000 000 000 000 000

Scientific notation:

$3.4652182923660698889791999999999999999999340111765957992640\times 10^{82}$

((((((-Pi/(8*Pi / 32) * (2.39304*10^-40) * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4))))))))))))^1/(288+89)

Input interpretation:

$$\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}\left((2.62561\times 10^{40})^2\,(1-2.62561\times 10^{40})^2-(2.62561\times 10^{40})^4\right)\right)\wedge\left(\frac{1}{288+89}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.655534659803065314865801229383558180315677025427489805908...

1.6555346598030653148658012293835581803156770254274898

We note that, the result 1,65553... is practically equal 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...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578\ldots \Rightarrow$$

$$\Rightarrow \left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}\left((2.62561\times 10^{40})^2\left(1-2.62561\times 10^{40}\right)^2-\left(2.62561\times 10^{40}\right)^4\right)\right)\hat{}\left(\frac{1}{288+89}\right)$$

= 1,65553...

((((((-Pi/(8*Pi / 32) * (2.39304*10^-40) * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))))))^((Pi/(6^4-55)))

Input interpretation:

$$\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}\left((2.62561\times 10^{40})^2\left(1-2.62561\times 10^{40}\right)^2-\left(2.62561\times 10^{40}\right)^4\right)\right)^{\pi/(6^4-55)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.617891542458113529749957957034346790322824909790215879570...

1.6178915424581135297499579570343467903228249097902158

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

Possible closed forms:

- More

$$\frac{-154\,\pi\,\pi!+2178-663\,\pi+610\,\pi^2}{519\,\pi}\approx 1.617891542458113529770351$$

Enlarge Data Customize A Plaintext Interactive

$$\frac{759\,083\,014\,\pi}{1\,473\,973\,723}\approx 1.61789154245811352980886$$

$$\frac{4}{5}\,\pi\tan^{-1}\left(\frac{57\,428\,281}{55\,515\,391}\right)^2\approx 1.61789154245811352974923507$$

27*4 + 10^3((((((-Pi/(8*Pi / 32) * (2.39304*10^-40) * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4)))))))))))^(Pi/(6^4-55)))

Input interpretation:

$$27\times 4+10^3\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}\right.$$
$$\left.((2.62561\times 10^{40})^2(1-2.62561\times 10^{40})^2-(2.62561\times 10^{40})^4)\right)^{\pi/(6^4-55)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

  1725.89...

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

[((((((((((27*4 + 10^3((((((-Pi/(8*Pi / 32) * (2.39304*10^-40) * ((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4))))))))^(Pi/(6^4-55))))))))))]^1/3

Input interpretation:

$$\left(27\times 4+10^3\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}((2.62561\times 10^{40})^2(1-2.62561\times 10^{40})^2-(2.62561\times 10^{40})^4)\right)^{\pi/(6^4-55)}\right)\text{^}(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

  11.9951...

This result is very near to the value of black hole entropy 12,1904

2*[((((((((((27*4 + 10^3((((((-Pi/(8*Pi / 32) * (2.39304*10^-40) * ((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4))))))))^(Pi/(6^4-55))))))))))]^1/3

Input interpretation:

$$2\left(27\times 4+10^3\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}((2.62561\times 10^{40})^2(1-2.62561\times 10^{40})^2-(2.62561\times 10^{40})^4)\right)^{\pi/(6^4-55)}\right)\text{^}(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

23.9902...

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

[((((((((((27*4 + 10^3((((((-Pi/(8*Pi / 32) * (2.39304*10^-40) * (((((((2.62561*10^40)^2*(((1-(2.62561*10^40))))^2-(2.62561*10^40)^4))))))))^(Pi/(6^4-55))))))))))]^1/15

Input interpretation:

$$\left(27\times 4+10^3\left(-\frac{\pi}{8\times\frac{\pi}{32}}\times 2.39304\times 10^{-40}\left((2.62561\times 10^{40})^2\left(1-2.62561\times 10^{40}\right)^2-\left(2.62561\times 10^{40}\right)^4\right)\right)^{\pi/(6^4-55)}\right)\text{^}(1/15)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643618042636121106855410261342020913851077894372850207584...

1.6436180426361211068554102613420209138510778943728502

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{27+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{8+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{15+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Possible closed forms:
- More

$\log\left(\frac{1}{3}\left(251 - 331\sqrt{2} - 46e + 90e^2 - 35\pi - 20\pi^2\right)\right) \approx 1.643618042636121108500 6$

root of $3325x^3 - 2824x^2 - 30196x + 42496$ near $x = 1.64362$ $\approx$

1.6436180426361211068913 00

$\frac{5239249949\pi}{10014242192} \approx 1.64361804263612110685968 01$

-

From:

Entropia e Termodinamica dei Buchi Neri
Candidato: **FRANCESCO BATTISTEL** *Relatore:* **Prof. STEFANO ANSOLDI**
Anno Accademico 2014/2015 - UNIVERSITÀ DEGLI STUDI DI TRIESTE CORSO DI STUDI IN FISICA

Important and useful note in Italian

“.....

Definiamo ora le seguenti funzioni:

$$\begin{cases} \Theta = \frac{r_+ - r_-}{4\alpha} & \text{“gravità di superficie”} \\ \phi = \frac{r_+ Q}{\alpha} & \text{“potenziale elettrico”} \\ \Omega = \frac{a}{\alpha} & \text{“frequenza angolare”.} \end{cases} \tag{3.11}$$

Otteniamo quindi una formula che ricorda molto quella che esprime il primo principio della termodinamica, che riporto sotto:

$$dM = \Theta\, d\alpha + \phi\, dQ + \boldsymbol{\Omega} \cdot d\boldsymbol{L} \tag{3.12}$$
$$dE = T\, dS - p\, dV. \tag{3.13}$$

Dai risultati di Hawking [6] sappiamo che l’area (razionalizzata o meno) dell’orizzonte degli eventi non può diminuire, ovvero che $d\alpha \geq 0$, così come in termodinamica $dS \geq 0$. La gravità di superficie dunque svolgerebbe il ruolo della temperatura (in particolare si nota facilmente da (3.9) che è una quantità sempre positiva), mentre $\phi\, dQ + \boldsymbol{\Omega} \cdot d\boldsymbol{L}$ rappresenterebbe il lavoro fatto sul buco nero dall’esterno. Si noti come definire un’entropia comporti anche inevitabilmente la definizione di una “temperatura”.

L’interpretazione fisica di Θ come una temperatura termodinamica non è comunque immediata, soprattutto poiché resta da capire se gli si possa assegnare lo stesso significato fisico della temperatura in processi in cui quest’ultima compare. La teoria della radiazione di Hawking suggerisce una risposta positiva: un buco nero infatti emetterebbe radiazione di corpo nero con temperatura $T \propto \Theta$, anche se sperimentalmente questo non è stato ancora verificato [10].

.....”

We have:

$$r_{\pm} = M \pm \sqrt{M^2 \quad Q^2 \quad a^2}.$$

we can to obtain Q and Q^2

We have also:

$$\begin{aligned}\alpha &= \left(M + \sqrt{M^2 - Q^2 - a^2}\right)^2 + a^2 \\ &= M^2 + M^2 - Q^2 - a^2 + 2M\sqrt{M^2 - Q^2 - a^2} + a^2 \\ &= 2M\left(M + \sqrt{M^2 - Q^2 - a^2}\right) - Q^2 \\ &= 2Mr_+ - Q^2\end{aligned}$$

and:

$$\phi = \frac{r_+ Q}{\alpha}$$

$$\Theta = \frac{r_+ - r_-}{4\alpha}$$

From the above formulas, we obtain, after some calculations, various interesting results.

For Q, we obtain:

sqrt(((((13.12806*10^39)^2 - (0.9/13.12806*10^39)^2 - (2.62561*10^40 - 13.12806*10^39)^2))))

Input interpretation:

$$\sqrt{(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2 - (2.62561 \times 10^{40} - 13.12806 \times 10^{39})^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.29155... \times 10^{37}$

For Q^2, we obtain:

Input interpretation:

$$(13.12806 \times 10^{39})^2 - \left(\frac{0.9}{13.12806 \times 10^{39}}\right)^2 - (2.62561 \times 10^{40} - 13.12806 \times 10^{39})^2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$5.25122000000000000000000000000000000000000000000\ldots \times 10^{74}$

For α, we obtain:

Input interpretation:

$$2 \times 13.12806 \times 10^{39} \times 2.62561 \times 10^{40} - 5.25122 \times 10^{74}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

689 382 787 210 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Scientific notation:

$6.8938278721 \times 10^{80}$

For ϕ, we obtain:

Input interpretation:

$$\frac{2.29155 \times 10^{37} \times 2.62561 \times 10^{40}}{6.8938278721 \times 10^{80}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.000872768613769752552740125151869470332608422423741530539...

Open code

From this formula, concerning the "electric potential", we obtain:

((((((((2.29155*10^37 * 2.62561*10^40))) / (((6.8938278721*10^80))))))))^1/14

Input interpretation:

$$\sqrt[14]{\frac{2.29155 \times 10^{37} \times 2.62561 \times 10^{40}}{6.8938278721 \times 10^{80}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

0.604634319297810930445826988746530721982611151127023401400...

And:

1/((((((((((2.29155*10^37 * 2.62561*10^40))) / (((6.8938278721*10^80)))))))))^1/14

Input interpretation:

$$\frac{1}{\sqrt[14]{\frac{2.29155\times 10^{37}\times 2.62561\times 10^{40}}{6.8938278721\times 10^{80}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.653892225570895550580899170745003769310106711597702021006...

1.6538922255708955505808991707450037693101067115977020

We note that, the result 1,653892... is practically equal 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...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578\ldots \Rightarrow$$

$$\Rightarrow \frac{1}{\sqrt[14]{\frac{2.29155\times 10^{37}\times 2.62561\times 10^{40}}{6.8938278721\times 10^{80}}}}$$

$= 1{,}653892\ldots$

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{31+\cfrac{1}{1+\cfrac{1}{142+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{22+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{3+\cfrac{1}{44+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{4854136156\,\pi}{9220503157} \approx 1.653892225570895550574111$$

$$\frac{1}{77}\left(-7\,C-2-621\,\pi+99\,\pi^2+294\,\pi\log(2)+136\,\pi\log(3)\right) \approx$$

1.653892225570895550599129

$$e^{19/2-3/e+16\,e-19/(2\,\pi)+7\,\pi}\,\pi^{-5/2-19\,e}\cos^{17}(e\,\pi)\cot^{3}(e\,\pi) \approx 1.653892225570895550088074$$

-

1+((((((((2.29155*10^37 * 2.62561*10^40))) / (((6.8938278721*10^80))))))))^1/16

Input interpretation:

$$1+\sqrt[16]{\frac{2.29155\times10^{37}\times2.62561\times10^{40}}{6.8938278721\times10^{80}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643881867488984117775060251756886610116821865101659670144...

1.64388186748898411777506025175688661011682186510165 96

Now, from the square root of Q and some calculations, we obtain:

((((((((sqrt(((((13.12806*10^39)^2 - (0.9/13.12806*10^39)^2 - (2.62561*10^40 - 13.12806*10^39)^2)))))))))))))^1/(27*4+24*3)

Input interpretation:

$$\left(\sqrt{(13.12806\times 10^{39})^2-\left(\frac{0.9}{13.12806\times 10^{39}}\right)^2-(2.62561\times 10^{40}-13.12806\times 10^{39})^2}\right)^{\wedge}\left(\frac{1}{27\times 4+24\times 3}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.612709998011943546281453811627390236978091251115274599872...

1.6127099980119435462814538116273902369780912511152745

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{2\left(-24-131\pi+157\pi^2\right)}{-200-260\pi+243\pi^2}\approx 1.61270999801194354664577$$

$$\frac{5346847349\,\pi}{10415769960}\approx 1.612709998011943546277409$$

$$\frac{-8889+31136\pi+8468\pi^2}{34048\pi}\approx 1.6127099980119435462876659$$

From Q^2, after the following exponentiation, we obtain:

((((((((((13.12806*10^39)^2 - (0.9/13.12806*10^39)^2 - (2.62561*10^40 - 13.12806*10^39)^2)))))))^1/(144*2+24*3)

Input interpretation:

$$\left((13.12806\times10^{39})^2-\left(\frac{0.9}{13.12806\times10^{39}}\right)^2-(2.62561\times10^{40}-13.12806\times10^{39})^2\right)\,\hat{}\,\left(\frac{1}{144\times2+24\times3}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.612709998011943546281453811627390236978091251115274599872...

1.6127099980119435462814538116273902369780912511152745

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{2(-24-131\pi+157\pi^2)}{-200-260\pi+243\pi^2}\approx 1.61270999801194354664577$$

$$\frac{5\,346\,847\,349\,\pi}{10\,415\,769\,960}\approx 1.612709998011943546277409$$

$$\frac{-8889+31\,136\,\pi+8468\,\pi^2}{34\,048\,\pi}\approx 1.6127099980119435462876659$$

From α, after some calculations, we obtain:

((((((((((2*13.12806*10^39 * 2.62561*10^40))) - (((5.25122*10^74))))))))))^1/(144*2+24*4+3)

Input interpretation:

$$\sqrt[144\times 2+24\times 4+3]{2\times 13.12806\times 10^{39}\times 2.62561\times 10^{40} - 5.25122\times 10^{74}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6176512984897950229013766514882799881268504930945160 22298...

1.61765129848979502290137665148827998812685049309451 60

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{203+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

π root of $46341x^3 - 3000x^2 + 31735x - 21872$ near $x = 0.514914$ $\approx$ 1.6176512984897950229089265

$$\frac{1459485949\,\pi}{2834424415} \approx 1.617651298489795022934642$$

$$\frac{1}{10}\sqrt[3]{\frac{22004681}{4997578}}\,\pi^2 \approx 1.617651298489795007367$$

This result 1,61765... is a very good approximation to the golden ratio 1,6180339887...

Now, from the formula of "surface gravity", we obtain:

(2.62561*10^40)/(4*6.8938278721*10^80)

Input interpretation:

$$\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$9.5215968860569543839336382783429374507257361146552610\ldots \times 10^{-42}$

Open code

And, after some calculations, the following interesting result:

1/2 * ((((2.62561*10^40)/(4*6.8938278721*10^80))))^-0.5

Input interpretation:

$$\frac{\frac{1}{2}}{\left(\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}\right)^{0.5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$1.6203734137537557117495892679784638305318710060786596\ldots \times 10^{20}$

$1.620373413753755711749589267978463830531871006070 \times 10^{20}$

And:

((((((1/((((2.62561*10^40)/(4*6.8938278721*10^80))))))))))^1/(24*8)

Input interpretation:

$$\sqrt[24\times 8]{\frac{1}{\frac{2.62561\times 10^{40}}{4\times 6.8938278721\times 10^{80}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6355075495160177079756918425758333248467466553534711 72542...

1.635507549516017707975691842575833324846746655353471 1

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{5+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{8}{7}\pi\tanh^{-1}\left(\frac{2758494}{4689641}\right)^2 \approx 1.6355075495160177710165$$

$$\frac{2201640321\,\pi}{4229058472} \approx 1.6355075495160177080314$$

$$\frac{-849\,e\,e! + 2675 + 9289\,e - 2422\,e^2}{44\,e} \approx 1.6355075495160177082274$$

From:

EVOLUTION OF NEAR-EXTREMAL BLACK HOLES

S.W. Hawking and M. M. Taylor-Robinson †
Department of Applied Mathematics and Theoretical Physics,
University of Cambridge, Silver St., Cambridge. CB3 9EW
(February 1, 2008)

We have:

We require here only the metric in the Einstein frame; the other fields in the solution may be found in [12]. The extremal limit is $r_0 \to 0$, $\sigma_i \to \infty$ with r_i fixed; we shall be interested in the sections of the moduli space where the BPS state is the extreme Reissner-Nordstrom solution, where the limiting values of r_i are equal to r_e, the Schwarzschild radius.

We require here only the metric in the Einstein frame; the other fields in the solution may be found in [12]. The extremal limit is $r_0 \to 0$, $\sigma_i \to \infty$ with r_i fixed; we shall be interested in the sections of the moduli space where the BPS state is the extreme Reissner-Nordstrom solution, where the limiting values of r_i are equal to r_e, the Schwarzschild radius.

We may regard the black hole as the compactification of a six-dimensional black string carrying momentum about the circle direction; we will be using this six-dimensional solution in the following sections, and the metric (in the Einstein frame) is given by:

$$ds^2 = (1+\frac{r_1^2}{r^2})^{-1/2}(1+\frac{r_5^2}{r^2})^{-1/2}[-dt^2 + dx_5^2 + \frac{r_0^2}{r^2}(\cosh\sigma_K dt + \sinh\sigma_K dx_5)^2] + (1+\frac{r_1^2}{r^2})^{1/2}(1+\frac{r_5^2}{r^2})^{1/2}\left[(1-\frac{r_0^2}{r^2})^{-1}dr^2 + r^2 d\Omega_3^2\right]. \quad (7)$$

We assume that we are in the very near extremal region where $r_0 \ll r_e$, and moreover will consider all three hyperbolic angles to be finite. It is here that our analysis differs from previous work; with this choice of parameters, we move away from the dilute gas region and a straightforward D-brane analysis of emission rates is not possible.

The entropy is:

$$S = \frac{A_h}{4G_5} = \frac{2\pi^2 r_0^3 \prod_i \cosh\sigma_i}{4G_5} \quad (8)$$

where we have taken $l = 0$ since we will be interested in very low energy scalars. We assume the low energy condition:

$$\omega r_e \ll 1, \quad (18)$$

Since the Hawking temperature T_H is much smaller than $1/r_e$ in the near extremal limit, $a \gg b$ and the low energy condition (18) implies that $b \ll 1$. From (29) we find:

$$\sigma^S_{abs} = \frac{1}{2}\pi\omega^3 r_1 r_5 r_K = \frac{1}{4\pi}A_h\omega^3. \quad (33)$$

where $\phi_K = \tanh \sigma_K$ is the Kaluza-Klein electrostatic potential on the horizon. Let us take the low energy limit, assuming that the emitted particles are non-relativistic, with kinetic energy δ; the near extremality condition implies that $\phi_K = 1 - \mu_K$ with $\mu_K \ll 1$. Under these conditions,

$$r'_K - r_K \frac{|\delta - m\mu_K|}{\sqrt{2m\delta}}. \tag{41}$$

The other region of interest is when the kinetic energy is very small, that is, $\delta \leq m\mu_K^2$; we then find that r'_K is of the same order or greater than the Schwarzschild radius. Since the thermal factor in the emission rate is large at small kinetic energies, it is important to consider carefully the behaviour of the absorption probability in this limit. Note that in this region the enforcement of the low energy condition requires that

$$mr_e \ll \frac{1}{\mu_K}. \tag{42}$$

This is the general expression for the absorption probability, and applies even when the mass is of the order of $1/r_e$, provided that the kinetic energy is greater than $m\mu_K^2$. It is interesting to consider the limiting expression when the kinetic energy is much smaller than the temperature. Now, the Hawking temperature is

$$T_H = \frac{\mu}{\pi r_e}, \tag{48}$$

Since the charged particles are emitted non-relativistically, emission of light charged particles dominates the emission of neutral scalars at very small energy. Since the density of states factor in (55) peaks for small kinetic energy, this indicates that the total rate of emission of light charged particles dominates that of neutrals. When we integrate the differential emission rate for neutrals, we find that the total rate of emission is

$$\Gamma_{neut}^{tot} = \frac{\pi^2}{120} A_h T_H^4. \tag{60}$$

The total emission rate of light charged particles is approximated by

$$carefullly\Gamma_{char}^{tot} = \frac{\zeta(3)}{2\pi^2} A_h m T_H^3, \tag{61}$$

and we find that most of the particles are emitted with kinetic energies of the order of $m\mu_K$. So comparing the total neutral and charged emission rates we find that

$$\frac{\Gamma_{char}^{tot}}{\Gamma_{neut}^{tot}} = \frac{60\zeta(3)}{\pi^4}(\frac{m}{T_H}). \tag{62}$$

We remember that:

$$G_5 = \pi/(2N^2).$$

From Wikipedia:

The **Schwarzschild radius** (sometimes historically referred to as the **gravitational radius**) is a physical parameter that shows up in the Schwarzschild solution to Einstein's field equations, corresponding to the radius defining the event horizon of a Schwarzschild black hole. It is a characteristic radius associated with every quantity of mass. The *Schwarzschild radius* was named after the German astronomer Karl Schwarzschild, who calculated this exact solution for the theory of general relativity in 1916.

The Schwarzschild radius is given as

$$r_s = \frac{2GM}{c^2}$$

where G is the gravitational constant, M is the object mass, and c is the speed of light.

Object	Mass: M	Schwarzschild radius:	Schwarzschild density:
SMBH in Messier 87[9]	1.3×10^{40} kg	1.9×10^{13} m	0.44 kg/m^3

(the mass of SMBH87 is 13.12806 * 10^{39} or 1.312806 * 10^{40})

From (48), for μ = 1/12, we have:

1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))

Input interpretation:

$$\frac{1}{12} \times \frac{1}{\pi \times \frac{2 \times 6.67 \times 10^{-11} \times 13.12806 \times 10^{39}}{9 \times 10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$1.3631856577655101159373972107070555965412517518250844... \times 10^{-15}$

Now, we obtain the Schwarzschild radius:

Input interpretation:

$$\frac{2 \times 6.67 \times 10^{-11} \times 13.12806 \times 10^{39}}{9 \times 10^{16}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.9458702266666666666666666666666666666666666666666... \times 10^{13}$

This result coincide with the official calculated value 1,9 * 10^{13} m of SMBH87

(((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/11

Input interpretation:

$$\sqrt[11]{\frac{2 \times 6.67 \times 10^{-11} \times 13.12806 \times 10^{39}}{9 \times 10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

16.147350085943156705592910519697862580037293692275889330 32...

1.614735008594315670559291051969786258003729369227588 9 *10

This result is a multiple that is a good approximation to the value of the golden ratio 1,618033988749

That is:

Result:

16.1473500859431567055929105196978625800372936922758 89

From the following formula of the Schwarzschild radius, we obtain a very good approximation to π:

1/3 * ((((((((((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/24 + (((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/26+ (((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/32)))

Input interpretation:

$$\frac{1}{3}\left(\sqrt[24]{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}+\sqrt[26]{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}+\sqrt[32]{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

3.141585120422757363404336968339718350902753479335502585667...

And to the value of a circle length with radius equal to 1:

2/3 * ((((((((((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/24 + (((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/26+ (((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^1/32)))

Input interpretation:

$$\frac{2}{3}\left(\sqrt[24]{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}+\sqrt[26]{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}+\sqrt[32]{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

6.283170240845514726808673936679436701805506958671005171335...

Now, we obtain, from this formula, also a good approximation to the golden ratio and to the Planck length $1.616255(18)\times10^{-35}$m without exponent. Indeed:

1/6 * ((((((((((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))^1/24 + (((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))^1/26+ (((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))^1/29)))

Input interpretation:

$$\frac{1}{6}\left(\sqrt[24]{\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}+\sqrt[26]{\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}+\sqrt[29]{\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.615882105092548537433452174965214333485611653099715628692...

1.615882105092548537433452174965214333485611653099715 6

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{11+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{66+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Possible closed forms:
- More

$\cot\left(\sin\left(\frac{27310513}{10692279}\right)\right) \approx 1.61588210509254853778005$

$\frac{6}{5}\pi\cos^2\left(\frac{9472141}{11052457}\right) \approx 1.61588210509254853382921$

$\frac{1}{8}\sqrt{\frac{1}{31}(7456 - 310e - 489\pi + 149\log(2))} \approx 1.61588210509254853740243 8$

From eq. (48), we also obtain:

1/2 * (((((((1/(((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))^1/29

Input interpretation:

$$\frac{1}{2}\times\frac{1}{\sqrt[29]{\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- Fewer digits
- More digits

1.627689476986962103429107124383388247451443930977664246817...

1.627689476986962103429107124383388247451443930977664 2

Continued fraction:
- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{18+\cfrac{1}{13+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{9+\cfrac{1}{13+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Possible closed forms:
- More

$$\frac{3973329310\,\pi}{7668896523} \approx 1.62768947698696210341648 3$$

$$\frac{7}{9}\,\pi \cot^2\left(\frac{54323197}{61294161}\right) \approx 1.6276894769869621033963 2$$

$$\frac{11145 - 23531\,e + 7277\,e^2}{215\,e} \approx 1.6276894769869621018554$$

Furthermore, from the same formula, we obtain a good approximation to π:

1/2 * (((((((1/((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))^1/29 + (((((((1/((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))^1/31

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{\sqrt[29]{\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}}}+\frac{1}{\sqrt[31]{\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

3.136033782196937680806015973450131357975782558713537979499...

3.1360337821969376808060159734501313579757825587135379

From eq. (60), we obtain the total rate of emission:

(Pi^2/120)* 4Pi*(1.945870226666666666666666666666666666666666666666 × 10^13)^2 * (1.36319*10^-15)^4

Input interpretation:

$$\frac{\pi^2}{120}\times 4\left(\pi\left(1.945870226666666666666666666666666666666666666666\times 10^{13}\right)^2\left(1.36319\times 10^{-15}\right)^4\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$1.351393033461805271640116035247810216356637903340934 4... \times 10^{-33}$

$1.351393033461805271640116035247810216356637903 3 \times 10^{-33}$

The A_h is given by:

4Pi*(1.94587022666666666666666666666666666666666666666 × 10^13)^2

Input interpretation:

$4\pi(1.94587022666666666666666666666666666666666666666 \times 10^{13})^2$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.7581443158086875924687879269539135845165735280755067... \times 10^{27}$

$4.758144315808687592468787926953 9 * 10^{27}$

From eq. (8):

$$S = \frac{A_h}{4G_5} = \frac{2\pi^2 r_0^3 \prod_i \cosh \sigma_i}{4G_5} \qquad (8)$$

We obtain:

(4.7581443158086875924687879295391358 45 * 10^27) / ((4*(Pi/32))

Input interpretation:

$$\frac{4.758144315808687592468787929539135845 \times 10^{27}}{4 \times \frac{\pi}{32}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.2116515004888911075555555556213876998... \times 10^{28}$

Series representations:

- More

$$\frac{4.7581443158086875924687879295391358450000 \times 10^{27}}{\frac{4\pi}{32}} = \frac{9.5162886316173751849375758590782716900000 \times 10^{27}}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{4.7581443158086875924687879295391358450000 \times 10^{27}}{\frac{4\pi}{32}} = \frac{1.9032577263234750369875151718156543380000 \times 10^{28}}{-1.0000000000000000000000000000000000000000 + \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

Open code

$$\frac{4.75814431580868759246878792953913584500000 \times 10^{27}}{\frac{4\pi}{32}} = \frac{3.80651545264695007397503034363130867600000 \times 10^{28}}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

- More

$$\frac{4.75814431580868759246878792953913584500000 \times 10^{27}}{\frac{4\pi}{32}} = \frac{1.90325772632347503698751517181565433800000 \times 10^{28}}{\int_0^{\infty} \frac{1}{1+t^2}\,dt}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{4.75814431580868759246878792953913584500000 \times 10^{27}}{\frac{4\pi}{32}} = \frac{9.51628863161737518493757585907827169000000 \times 10^{27}}{\int_0^{1} \sqrt{1-t^2}\,dt}$$

Open code

$$\frac{4.75814431580868759246878792953913584500000 \times 10^{27}}{\frac{4\pi}{32}} = \frac{1.90325772632347503698751517181565433800000 \times 10^{28}}{\int_0^{\infty} \frac{\sin(t)}{t}\,dt}$$

And:

((((((4.758144315808687592468787929539135845 * 10^27) / ((4*(Pi/32)))))))^1/128

Input interpretation:

$$\sqrt[128]{\frac{4.758144315808687592468787929539135845 \times 10^{27}}{4 \times \frac{\pi}{32}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

- Result:
  More digits
  1.657300984985727351757270933109076378 85...

1.65730098498572735175727093310907637885

And:

(((((((4.75814431580868759246878792953913 5845 * 10^27) / ((4*(Pi/32)))))))^0.0072973525693

Where 0,007297... is the fine-structure constant

Input interpretation:

$$\left(\frac{4.758144315808687592468787929539135845\times 10^{27}}{4\times\frac{\pi}{32}}\right)^{0.0072973525693}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:
- Fewer digits
- More digits

1.6030029020420713802642897906445656247022032406159033556 76...

In conclusion, from 1/134,3775 as exponent, where the denominator is a very good approximation to the rest mass of the π^0 : 134.9766(6) MeV/c^2

(((((((4.758144315808687592468787929539135845 * 10^27) / ((4*(Pi/32)))))))^1/134.3775

Input interpretation:

$$\sqrt[134.3775]{\frac{4.758144315808687592468787929539135845\times 10^{27}}{4\times\frac{\pi}{32}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:
- Fewer digits
- More digits

1.6180379007097542429308456816311174385896266069616154 49665...

1.6180379007097542429308456816311174385896266069616154

Continued fraction:
- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\ddots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{25\,275\,229\,\pi^2}{154\,172\,230} \approx 1.61803790070975420511 3$$

π root of $2773\,x^3 + 21\,349\,x^2 - 7246\,x - 2310$ near $x = 0.515037$ $\approx$

1.61803790070975424289823

$$\frac{4\,254\,190\,831\,\pi}{8\,259\,963\,908} \approx 1.6180379007097542429 42337$$

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

With the exact value of mass of π^0, i.e. 134.9766, we obtain:

(((((((4.7581443158086875924687879295391358 45 * 10^27) / ((4*(Pi/32)))))))^1/134.9766

Input interpretation:

$$\sqrt[134.9766]{\frac{4.758144315808687592468787929539135845\times 10^{27}}{4\times\frac{\pi}{32}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits

- More digits

1.6145856344959195961728809437966727788147162317533943 05275...

Furthermore, with the mean of the two Pion masses 134.9766 and 139.57018, we obtain:

1/2(((((((((((((4.7581443158086875920000 * 10^27) / ((4*(Pi/32)))))))^1/134.9766 + (((((((4.7581443158086875920000 * 10^27) / ((4*(Pi/32)))))))^1/139.57018)))))))))))

Input interpretation:

$$\frac{1}{2}\left(\sqrt[134.9766]{\frac{4.7581443158086875920000\times 10^{27}}{4\times\frac{\pi}{32}}}+\sqrt[139.57018]{\frac{4.7581443158086875920000\times 10^{27}}{4\times\frac{\pi}{32}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6019564039579592885629332194366186723660125273614725 16867...

Integral representations:

- More

$$\frac{1}{2}\left(\sqrt[134.977]{\frac{4.7581443158086875920000\times 10^{27}}{\frac{4\pi}{32}}}+\sqrt[139.57]{\frac{4.7581443158086875920000\times 10^{27}}{\frac{4\pi}{32}}}\right)=0.797239\left(\left(\frac{1}{\int_0^\infty \frac{1}{1+t^2}\,dt}\right)^{0.00716485}+1.016\left(\frac{1}{\int_0^\infty \frac{1}{1+t^2}\,dt}\right)^{0.00740869}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\left(\sqrt[134.977]{\frac{4.7581443158086875920000\times 10^{27}}{\frac{4\pi}{32}}}+\sqrt[139.57]{\frac{4.7581443158086875920000\times 10^{27}}{\frac{4\pi}{32}}}\right)=0.797239\left(\left(\frac{1}{\int_0^\infty \frac{\sin(t)}{t}\,dt}\right)^{0.00716485}+1.016\left(\frac{1}{\int_0^\infty \frac{\sin(t)}{t}\,dt}\right)^{0.00740869}\right)$$

Open code

$$\frac{1}{2}\left(\sqrt[134.977]{\frac{4.7581443158086875920000\times 10^{27}}{\frac{4\pi}{32}}}+\sqrt[139.57]{\frac{4.7581443158086875920000\times 10^{27}}{\frac{4\pi}{32}}}\right)=$$

$$0.793289\left(\left(\frac{1}{\int_0^1\sqrt{1-t^2}\,dt}\right)^{0.00716485}+1.01583\left(\frac{1}{\int_0^1\sqrt{1-t^2}\,dt}\right)^{0.00740869}\right)$$

This result 1,601956 is very near to the value of electric charge of positron.

From eq. (61), we obtain total emission rate of light charged particles:

Note that:

the low energy condition implies that $m \ll 1/r_e\mu_K$.

Thence m = 0.0416666..../ $r_e\,\mu_K$ where 0.04166666... = 1/24

zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [((((1.36319 × 10^-15)^3))))]

Input interpretation:

$$\frac{\zeta(3)}{2\pi^2}\times 4\pi\,(1.945870226666\times 10^{13})^2\left(\frac{0.041666}{1.945870226666\times 10^{13}\times\frac{1}{12}}\,(1.36319\times 10^{-15})^3\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.88604\ldots\times 10^{-32}$

And we obtain a golden number, after some calculations. Indeed:

sqrt(55+21) * zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [((((1.36319 × 10^-15)^3))))]

Input interpretation:

$$\sqrt{55+21} \times \frac{\zeta(3)}{2\pi^2} \left(4\pi(1.945870226666 \times 10^{13})^2 \left(\frac{0.041666}{1.945870226666 \times 10^{13} \times \frac{1}{12}} (1.36319 \times 10^{-15})^3\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6442128927180006344634436695539529754977765021059871... × 10^{-31}

1.6442128927180006344634436695539529754977765021 × 10^{-31}

Or:

1/pi(((((((zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [((((1.36319 × 10^-15)^3))))])))))))))^1/6

Input interpretation:

$$\frac{1}{\pi} \left(\frac{\zeta(3)}{2\pi^2} \times 4\pi(1.945870226666 \times 10^{13})^2 \left(\frac{0.041666}{1.945870226666 \times 10^{13} \times \frac{1}{12}} (1.36319 \times 10^{-15})^3\right)\right)\hat{}\,(1/6)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.6422603319815372207725283030901438436711722461024767... × 10^{-6}

1.6422603319815372207725283030901438436711722461 0 × 10^{-6}

And:

1/(((((((((((((((zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [((((1.36319 × 10^-15)^3))))])))))))))^1/(89+55+8)))))))))))))))

Input interpretation:

$$1 \Big/ \left(\left(\frac{\zeta(3)}{2\pi^2} \times 4\pi(1.945870226666 \times 10^{13})^2 \left(\frac{0.041666}{1.945870226666 \times 10^{13} \times \frac{1}{12}} (1.36319 \times 10^{-15})^3\right)\right)\hat{}\left(\frac{1}{89+55+8}\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.617012877727429697365243437423836059542723277886069742868...

1.6170128777274296973652434374238360595427232778860697

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{53+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{3+\cfrac{1}{16+\cfrac{1}{24+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{\log\left(\frac{82889639}{19932}\right)}{\log(173)} \approx 1.61701287772742969797077$$

$$\text{root of } 510x^3 - 28712x^2 + 34341x + 17388 \text{ near } x = 1.61701 \approx 1.6170128777274296973644126$$

$$\frac{2610109937\pi}{5071018491} \approx 1.61701287772742969741357$$

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

2.02 * sqrt(55+13) * zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [(((((1.36319 × 10^-15)^3))))]

Where 2.02 is a Hausdorff dimension

Input interpretation:

$$2.02\sqrt{55+13}\times\frac{\zeta(3)}{2\pi^2}\left(4\pi\left(1.945870226666\times10^{13}\right)^2\left(\frac{0.041666}{1.945870226666\times10^{13}\times\frac{1}{12}}\left(1.36319\times10^{-15}\right)^3\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$3.1416447826127819571929552797586422793218400287631010... \times 10^{-31}$

$3.1416447826127819571929552797586422793218400287 \times 10^{-31}$

Or:

tan(pi^3/27) * sqrt(24+32) * zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [(((((1.36319 × 10^-15)^3))))]

Input interpretation:

$$\tan\left(\frac{\pi^3}{27}\right)\sqrt{24+32}\times\frac{\zeta(3)}{2\pi^2}\left(4\pi\left(1.945870226666\times10^{13}\right)^2\left(\frac{0.041666}{1.945870226666\times10^{13}\times\frac{1}{12}}\left(1.36319\times10^{-15}\right)^3\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$3.1400858023149057147399878920763356266065256769221713... \times 10^{-31}$

$3.1400858023149057147399878920763356266065256769 \times 10^{-31}$

2 * tan(pi^3/27) * sqrt(24+32) * zeta (3) / (2*Pi^2) 4Pi*(1.945870226666 × 10^13)^2 * ((((0.041666/(((1.945870226666 × 10^13*(1/12))))) * [(((((1.36319 × 10^-15)^3))))]

Input interpretation:

$$2\tan\left(\frac{\pi^3}{27}\right)\sqrt{24+32}\times\frac{\zeta(3)}{2\pi^2}\left(4\pi\left(1.945870226666\times10^{13}\right)^2\left(\frac{0.041666}{1.945870226666\times10^{13}\times\frac{1}{12}}\left(1.36319\times10^{-15}\right)^3\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive
Result:
- Fewer digits
- More digits

$6.2801716046298114294799757841526712532130513538443426... \times 10^{-31}$

$6.280171604629811429479975784152671253213051353 8 \times 10^{-31}$

Results that are very good approximations to the sub-multiple of π and of the length of a circle with radius equal to 1: 2π

From the ratio of (61) and (60), we obtain:

((((1.8860415371116967863093997735164205500641104 29 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4)))))

Input interpretation:

$$\frac{1.886041537111696786309399773516420550064110429 \times 10^{-32}}{\frac{\pi^2}{120} \times 4\left(\pi\left(1.94587022666666 \times 10^{13}\right)^2\left(1.36319 \times 10^{-15}\right)^4\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

13.9563...

Note that:

10*((((1.886041537111696786309399773516420550064110429 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4)))))

Input interpretation:

$$10 \times \frac{1.886041537111696786309399773516420550064110429 \times 10^{-32}}{\frac{\pi^2}{120} \times 4\left(\pi\left(1.94587022666666 \times 10^{13}\right)^2\left(1.36319 \times 10^{-15}\right)^4\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

139.563...

139.563...

This result is practically equal to the rest mass of Pion meson 139.57018±0.00035

Moreover, we obtain:

1/2 * ((((((((39/(8Pi)) + ((((((((1.886041537111696786309399773516420550064110429 × 10^-32))) /

((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4)))))))))^1/5)))))

Input interpretation:

$$\frac{1}{2}\left(\frac{39}{8\pi}+\sqrt[5]{\frac{1.886041537111696786309399777351642055006411042\,9\times 10^{-32}}{\frac{\pi^2}{120}\times 4\left(\pi\left(1.94587022666666\times 10^{13}\right)^2\left(1.36319\times 10^{-15}\right)^4\right)}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.622959356480842475325171552239979974131578906498277334869...

1.6229593564808424753251715522399799741315789064982773

Possible closed forms:

- More

$\frac{649\,992\,830\,\pi}{1\,258\,203\,227} \approx 1.622959356480842475365228$

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$-\frac{3(-91+263e+106e^2)}{-809-768e+40e^2} \approx 1.62295935648084247559727$

π (root of $42\,500x^3 - 48\,950x^2 + 45\,666x - 16\,387$ near $x = 0.516604$) $\approx$ 1.62295935648084247532592162

3/10*((sqrt(27/4))^2 * ((((((((1.8860415371116967863093997773516420550064110429 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4)))))))))^1/6)))))

Input interpretation:

$$\frac{3}{10}\left(\sqrt{\frac{27}{4}}^{\,2}\sqrt[6]{\frac{1.886041537111696786309399777351642055006411042\,9\times 10^{-32}}{\frac{\pi^2}{120}\times 4\left(\pi\left(1.94587022666666\times 10^{13}\right)^2\left(1.36319\times 10^{-15}\right)^4\right)}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

3.142099670095262273390039119892080064673610213120112762629...

3.1420996700952622733900391198920800646736102131201127

3/5*((sqrt(27/4))^2 * ((((((((1.8860415371116967863093997773516420550064110429 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4)))))))))^1/6)))))

Input interpretation:

$$\frac{3}{5}\left(\sqrt{\frac{27}{4}}^{\,2}\sqrt[6]{\frac{1.8860415371116967863093997773516420550064110429\times10^{-32}}{\frac{\pi^2}{120}\times4\left(\pi\left(1.94587022666666\times10^{13}\right)^2\left(1.36319\times10^{-15}\right)^4\right)}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

6.2841993401905245467800782397841601293472204262402255525258...

6.2841993401905245467800782397841601293472204262402255

Results that are very good approximations to the values of the golden ratio, of π and of the length of a circle with radius equal to 1: 2π

In conclusion, we obtain the following result:

(288+21*2) + 10^2*((((1.8860415371116967863093997773516420550064110429 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4)))))

Input interpretation:

$$(288+21\times2)+10^2\times\frac{1.8860415371116967863093997773516420550064110429\times10^{-32}}{\frac{\pi^2}{120}\times4\left(\pi\left(1.94587022666666\times10^{13}\right)^2\left(1.36319\times10^{-15}\right)^4\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1725.63...

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.

(((((((288+21*2) + 10^2*((((1.8860415371116967863 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4))))))))))^1/3

Input interpretation:

$$\sqrt[3]{(288+21\times2)+10^2\times\frac{1.8860415371116967863\times10^{-32}}{\frac{\pi^2}{120}\times4\left(\pi\left(1.94587022666666\times10^{13}\right)^2\left(1.36319\times10^{-15}\right)^4\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

11.9945...

This result is very near to the value of black hole entropy 12,1904

2*(((((((288+21*2) + 10^2*((((1.88604153711116967863 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4))))))))))^1/3

Input interpretation:

$$2\sqrt[3]{(288+21\times 2)+10^2\times \frac{1.88604153711116967863\times 10^{-32}}{\frac{\pi^2}{120}\times 4\left(\pi\left(1.94587022666666\times 10^{13}\right)^2\left(1.36319\times 10^{-15}\right)^4\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

23.9890...

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

(((((((288+21*2) + 10^2*((((1.88604153711116967863 × 10^-32))) / ((((((Pi^2/120)* 4Pi*(1.94587022666666 × 10^13)^2 * (1.36319*10^-15)^4))))))))))^1/15

Input interpretation:

$$\sqrt[15]{(288+21\times 2)+10^2\times \frac{1.88604153711116967863\times 10^{-32}}{\frac{\pi^2}{120}\times 4\left(\pi\left(1.94587022666666\times 10^{13}\right)^2\left(1.36319\times 10^{-15}\right)^4\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643601289781022355362256847780804625738372542906323612454...

1.6436012897810223553622568477808046257383725429063236

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{22+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{72+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{200\sqrt[4]{\frac{228331}{13900839}}\sqrt{5}}{\pi^4} \approx 1.6436012897810223 42776$$

$$\frac{2944827841\,\pi}{5628767493} \approx 1.6436012897810223553 42532$$

π (root of $33117x^3 - 23142x^2 + 6059x - 1578$ near $x = 0.523175$) $\approx$

1.6436012897810223553 42501

Now:

For a Reissner-Nordstrom state with the integral charges equal we find that:

$$\left.\frac{d\Delta E}{dt}\right|_{char} \approx \frac{\pi^3}{60} A_h T_H^4 \left(\frac{n}{r_c}\right) e^{-\pi\sqrt{n}}, \qquad (76)$$

(Pi^3/60) * (4.7581443158086875924 * 10^27) * (((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))))^4 * 576/(1.945870226666 × 10^13) * exp(((-Pi * sqrt(576)))

Input interpretation:

$$\frac{\pi^3}{60}\left(4.7581443158086875924\times 10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)^4\times\frac{576}{1.945870226666\times 10^{13}}\exp\left(-\pi\sqrt{576}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.52098...\times 10^{-76}$

4.52098×10^{-76}

((((((((Pi^3/60) * (4.758144315808687 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))))^4 * 576/(1.94587022666 × 10^13) * exp(((-Pi * sqrt(576))))))))^(5/(52pi))

Input interpretation:

$$\left(\left(\frac{\pi^3}{60}\left(4.758144315808687\times 10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)\right)^4\times\frac{576}{1.94587022666\times 10^{13}}\exp\left(-\pi\sqrt{576}\right)\right)^{5/(52\pi)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.617951671855428536870560564402069776568766034281145913354...

1.6179516718554285368705605644020697765687660342811459

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{404+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{21+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\dots}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$-\cot\left(\cot\left(\frac{69154018}{8272425}\right)\right) \approx 1.61795167185542853 81469$

$\left(\frac{14677517}{35554810}\right)^{3/4} \pi \approx 1.617951671855428 590261$

$\frac{1869224039\,\pi}{3629490677} \approx 1.61795167185542853686 0251$

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

And:

(((((((Pi^3/60) * (4.758144315808687 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))))^4 * 576/(1.94587022666 × 10^13) * exp(((-Pi * sqrt(576))))))))^(19/(60Pi^2)

Input interpretation:

$$\left(\left(\frac{\pi^3}{60}\left(4.758144315808687\times 10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)\right)^4\times\frac{576}{1.94587022666\times 10^{13}}\exp\left(-\pi\sqrt{576}\right)\right)^{19/(60\pi^2)}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- Fewer digits
- More digits

1.655993766387731100814708052868791707994755041538114982369...
1.65599376638773110081470805286879170799475504153811149

We note that, the result 1,655993... is practically equal 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...

Indeed:

$$\sqrt[14]{\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3} = 1{,}65578\ldots \Rightarrow$$

$$\Rightarrow \left(\left(\frac{\pi^3}{60}\left(4.758144315808687\times10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)\right)^4\times\frac{576}{1.94587022666\times10^{13}}\exp\left(-\pi\sqrt{576}\right)\right)^{19/(60\pi^2)}$$

$= 1.655993\ldots$

We have also that:

27*4+10^3(((((Pi^3/60) * (4.7581443158 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))))^4 * 576/(1.94587022666 × 10^13) * exp(((-Pi * sqrt(576)))))))))^(5/(52pi))

Input interpretation:

$$27\times4+10^3\left(\left(\frac{\pi^3}{60}\left(4.7581443158\times10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)\right)^4\times\frac{576}{1.94587022666\times10^{13}}\exp\left(-\pi\sqrt{576}\right)\right)^{5/(52\pi)}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- Fewer digits

- More digits
  1725.951671855066898473334878492988308841298971245363894821...

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

And from the result 1725.9516718550668984733348784929 8..., we obtain:

(1725.951671855066898473334878492988308841298971245363 8)^1/3

Input interpretation:

$\sqrt[3]{1725.9516718550668984733348784929883088412989712453638}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  11.995256624944309932306432942141887620743658571921392...

This result is very near to the value of black hole entropy 12,1904

2 * (1725.9516718550668984733348784929883088412989712453638)^1/3

Input interpretation:

$2\sqrt[3]{1725.9516718550668984733348784929883088412989712453638}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  23.990513249888619864612865884283775241487317143842784...

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

(1725.9516718550668984733348784929883088412989712453638)^1/15

Input interpretation:

$\sqrt[15]{1725.9516718550668984733348784929883088412989712453638}$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

1.64362186010871455873490720337034033149194459420173908...

1.64362186010871455873490720337034033149194459420173908

Now:

and so we find the ratio of energy loss rates to be using (48)

$$\frac{\frac{d\Delta E}{dt}_{char}}{\frac{d\Delta E}{dt}_{neut}} \approx \frac{\pi^6}{180\zeta(5)}\frac{n}{\mu}e^{-\pi\sqrt{n}}. \quad (77)$$

It is not difficult to extend the analysis of the section above to show that, under the conditions $R^2 \gg g$ and $n_i = n$, for emission of the other two types of charges, the energy loss rates compare as

$$\frac{\frac{d\Delta E}{dt}_{i}}{\frac{d\Delta E}{dt}_{neut}} \approx \frac{\pi^6}{180\zeta(5)}\frac{n}{\mu_i}e^{-\pi\sqrt{n}}, \quad (80)$$

where we assume that the μ_i are very small, but non-zero. There are two important points

We have that μ = 1/12 and n = 576, thence we obtain, for (77) and (80), the following result:

(((Pi^6) / (180 * zeta(5)) * ((576 / (1/12))) * (((exp(-Pi*(sqrt(576)))

Input:

$$\frac{\pi^6}{180\,\zeta(5)} \times \frac{576}{\frac{1}{12}} \exp\left(-\pi\sqrt{576}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive
Exact result:

$$\frac{192\,e^{-24\pi}\,\pi^6}{5\,\zeta(5)}$$

Decimal approximation:
- More digits

6.4039726586841887297127010770185813039177508985143948... × 10^{-29}

Open code

Series representations:
- More

$$\frac{\left(576\exp\left(-\pi\sqrt{576}\right)\right)\pi^6}{\frac{180\,\zeta(5)}{12}} = \frac{192\,e^{-24\pi}\,\pi^6}{5\sum_{k=1}^{\infty}\frac{1}{k^5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(576\exp\left(-\pi\sqrt{576}\right)\right)\pi^6}{\frac{180\,\zeta(5)}{12}} = \frac{186\,e^{-24\pi}\,\pi^6}{5\sum_{k=0}^{\infty}\frac{1}{(1+2k)^5}}$$

Open code

$$\frac{\left(576\exp\left(-\pi\sqrt{576}\right)\right)\pi^6}{\frac{180\,\zeta(5)}{12}} = \frac{192}{5}\,e^{-24\pi-\sum_{k=1}^{\infty}P(5k)/k}\,\pi^6$$

Open code

- $P(z)$ gives the prime zeta function

Integral representations:

More

$$\frac{\left(576\exp\left(-\pi\sqrt{576}\right)\right)\pi^6}{\frac{180\,\zeta(5)}{12}} = -\frac{1152\,e^{-24\pi}\,\pi^6}{\int_0^1\frac{\log^5(1-t^4)}{t^5}\,dt}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(576\exp\left(-\pi\sqrt{576}\right)\right)\pi^6}{\frac{180\,\zeta(5)}{12}} = \frac{864\,e^{-24\pi}\,\pi^6}{\int_0^{\infty}\frac{t^4}{1+e^t}\,dt}$$

Open code

$$\frac{\left(576\exp\left(-\pi\sqrt{576}\right)\right)\pi^6}{\frac{180\,\zeta(5)}{12}} = \frac{8928\,e^{-24\pi}\,\pi^6}{5\int_0^{\infty}t^4\,\mathrm{csch}(t)\,dt}$$

Open code

- $\log(x)$ is the natural logarithm
- $\mathrm{csch}(x)$ is the hyperbolic cosecant function

Note that, we obtain:

(7Pi)/(87) * ((((((Pi^6) / (180 * zeta(5)) * ((576 / (1/12))) * (((exp(-Pi*(sqrt(576)))))))

Input:

$$\frac{7\pi}{87}\left(\frac{\pi^6}{180\,\zeta(5)}\times\frac{576}{\frac{1}{12}}\exp\left(-\pi\sqrt{576}\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{448\,e^{-24\pi}\,\pi^7}{145\,\zeta(5)}$$

Decimal approximation:

- More digits

$1.6187438414733908751431813333704766005093323784227589... \times 10^{-29}$

Open code

Series representations:

- More

$$\frac{\left(\pi^6\,576\exp\left(-\pi\sqrt{576}\right)\right)(7\pi)}{\frac{1}{12}(180\,\zeta(5))\,87}=\frac{448\,e^{-24\pi}\,\pi^7}{145\sum_{k=1}^{\infty}\frac{1}{k^5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(\pi^6\,576\exp\left(-\pi\sqrt{576}\right)\right)(7\pi)}{\frac{1}{12}(180\,\zeta(5))\,87}=\frac{434\,e^{-24\pi}\,\pi^7}{145\sum_{k=0}^{\infty}\frac{1}{(1+2k)^5}}$$

Open code

$$\frac{\left(\pi^6\,576\exp\left(-\pi\sqrt{576}\right)\right)(7\pi)}{\frac{1}{12}(180\,\zeta(5))\,87}=\frac{448}{145}\,e^{-24\pi-\sum_{k=1}^{\infty}P(5k)/k}\,\pi^7$$

Open code

- $P(z)$ gives the prime zeta function
-

Integral representations:

- More

$$\frac{\left(\pi^6\,576\exp\left(-\pi\sqrt{576}\right)\right)(7\pi)}{\frac{1}{12}(180\,\zeta(5))\,87}=\frac{20\,832\,e^{-24\pi}\,\pi^7}{145\int_0^{\infty}t^4\,\mathrm{csch}(t)\,dt}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(\pi^6\, 576 \exp\left(-\pi\sqrt{576}\right)\right)(7\pi)}{\frac{1}{12}(180\,\zeta(5))\,87} = \frac{672\, e^{-24\pi}\,\pi^7}{29\int_0^\infty t^5 \operatorname{csch}^2(t)\,dt}$$

Open code

$$\frac{\left(\pi^6\, 576 \exp\left(-\pi\sqrt{576}\right)\right)(7\pi)}{\frac{1}{12}(180\,\zeta(5))\,87} = \frac{630\, e^{-24\pi}\,\pi^7}{29\int_0^\infty t^5 \operatorname{sech}^2(t)\,dt}$$

Open code

- $\operatorname{csch}(x)$ is the hyperbolic cosecant function
- $\operatorname{sech}(x)$ is the hyperbolic secant function

The result 1.6187438414733908751431813333704766005093323784227589 × 10^{-29} is a very good approximation to the value of golden ratio 1,61803398…

From:

If $n_K \gg n_1 n_5$ we must allow for emission of particles of greater than the minimum BPS mass. For a Reissner-Nordstrom solution, the mass of Kaluza-Klein charged particles is quantised as

$$m = \frac{c}{r_e}\sqrt{\frac{n_1 n_5}{n_K}}, \tag{83}$$

where c is an integer; the mass is small on the scale of the Schwarzschild radius, and charged emission will dominate neutral emission. We calculate the rate of energy emission for a particle of general mass m, using (54) and (74) as,

$$\left.\frac{d\Delta E}{dt}\right|_{char} \approx \frac{\pi^3}{60} A_h T_H^4 \frac{m^2 r_e}{(e^{\pi m r_e} - 1)}, \tag{84}$$

and integrate over all masses to find that

$$\left.\frac{d\Delta E}{dt}\right|_{KK} \approx \frac{\zeta(3)}{30} A_h T_H^4 \frac{1}{r_e}\sqrt{\frac{n_K}{n_1 n_5}}. \tag{85}$$

For $n_1 n_5 = 8$, $c = 3$ and $n_K = 128$, from the eq. (83), we obtain:

((((3 / (1.945870226666 × 10^13)))) * (sqrt(8/128))

Input interpretation:

$$\frac{3}{1.945870226666\times 10^{13}}\sqrt{\frac{8}{128}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$3.8543166431249075063851722662349196511563991176099316... \times 10^{-14}$

Open code

3.8543166431249075063851722662349196511563991176099316 × 10^-14

And:

1/ (((((((3 / (1.945870226666 × 10^13)))) * (sqrt(8/128))))))^1/64

Input interpretation:

$$\frac{1}{\sqrt[64]{\frac{3}{1.945870226666\times 10^{13}}\sqrt{\frac{8}{128}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6202967915424...

1.6202967915424

This result is very near to the value of golden ratio 1.61803398...

We have also:

1/ (((((((3 / (1.945870226666 × 10^13)))) * (sqrt(8/128))))))^1/27

Input interpretation:

$$\frac{1}{\sqrt[27]{\frac{3}{1.945870226666\times 10^{13}}\sqrt{\frac{8}{128}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

3.1391839360794264234564408703191066214280164431643745376O6...

2/ (((((((3 / (1.945870226666 × 10^13)))) * (sqrt(8/128))))))^1/27

Input interpretation:

$$\frac{2}{\sqrt[27]{\frac{3}{1.945870226666\times10^{13}}\sqrt{\frac{8}{128}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

6.278367872158852846912881740638213242856032886328749075213...

6.2783678721588528469128817406382132428560328863287490

Results that are very near to the values of π and of the length of a circle of radius equal to 1: 2π

From eq. (84), we obtain:

(Pi^3/60) * (4.7581443158086875924 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))))^4

Input interpretation:

$$\frac{\pi^3}{60}\left(4.7581443158086875924\times10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^4$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$8.49094...\times10^{-33}$

((((3.854316643124907506385 × 10^-14)^2 * (1.945870226666 × 10^13))))) / ((((exp((((Pi*3.854316643124907506385 × 10^-14*1.945870226666 × 10^13))))-1))))

Input interpretation:

$$\frac{(3.854316643124907506385\times10^{-14})^2\times1.945870226666\times10^{13}}{\exp(\pi\times3.854316643124907506385\times10^{-14}\times1.945870226666\times10^{13})-1}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$3.02672075948...\times10^{-15}$

The final result is:

(Pi^3/60) * (4.7581443158086875924 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))))^4 * (((3.0267207594796896211468181363271747269049649317 × 10^-15)))

Input interpretation:

$$\frac{\pi^3}{60}\left(4.7581443158086875924\times 10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)^4\times 3.0267207594796896211468181363271747269049649317\times 10^{-15}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.56997... \times 10^{-47}$

1/ (2.5699718484414413879084168551853846277523893240 × 10^-47)^1/223

Input interpretation:

$$\frac{1}{\sqrt[223]{2.5699718484414413879084168551853846277523893240\times 10^{-47}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.617797232103301159000614387871237651834082097712...

1.617797232103301159000614387871237651834082097712

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

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{7+\cfrac{1}{139+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\log\left(308+20\sqrt{2}-3e-291e^2-75\pi+209\pi^2\right) \approx 1.61779723210330114 7289$

$\frac{803638169\pi}{1560581090} \approx 1.6177972321033011589591$

$-e^{-\frac{41}{7e}+\frac{9e}{7}+\frac{5}{\pi}-\frac{3\pi}{7}}\pi^{-11/7-(3e)/7}\tan(e\pi)\sec^4(e\pi) \approx 1.61779723210330115945119$

-

From eq. (85), we obtain:

(zeta (3)/30) * (4.7581443158086875924 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))))^4

Input interpretation:

$$\frac{\zeta(3)}{30}\left(4.7581443158086875924\times 10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)^4$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$6.58357\ldots\times 10^{-34}$

(((1/(1.945870226666 × 10^13))) * (((sqrt(128/8)))

Input interpretation:

$$\frac{1}{1.945870226666\times 10^{13}}\sqrt{\frac{128}{8}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.0556355429999506700720918753252904806167461960586301... \times 10^{-13}$

Open code

The final result is:

(zeta (3)/30) * (4.7581443158086875924 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))))^4 * (((2.0556355429999506700720918753252904806167461960586301 × 10^-13)))

Input interpretation:

$$\frac{\zeta(3)}{30}\left(4.7581443158086875924\times 10^{27}\right)\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)^4\times 2.0556355429999506700720918753252904806167461960586301\times 10^{-13}$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.35334... \times 10^{-46}$

1/2 (((((1/ ((1.3533419166425984230015741260045868872261962557 × 10^-46))^1/220 + 1/ ((1.3533419166425984230015741260045868872261962557 × 10^-46))^1/219)))))

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{\sqrt[220]{1.3533419166425984230015741260045868872261962557\times 10^{-46}}}+\frac{1}{\sqrt[219]{1.3533419166425984230015741260045868872261962557\times 10^{-46}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6179678057146687350895839626130548144699120333398...

1.6179678057146687350895839626130548144699120333398

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

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{11+\cfrac{1}{3+\cfrac{1}{5+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\sqrt{\frac{10800091}{40718091}}\,\pi \approx 1.61796780571466872240 5$$

$$\frac{394885145\,\pi}{766744719} \approx 1.6179678057146687351 2348$$

$$\pi \left[\text{root of } 95801\,x^3 - 6924\,x^2 - 34077\,x + 6300 \text{ near } x = 0.515015\right] \approx 1.6179678057146687351 0697$$

From (85), we have also that:

27*4 + 10^3 * 1/2 (((((1/ ((1.3533419166425984230015 7 × 10^-46))^1/220 + 1/ ((1.3533419166425984230015 7 × 10^-46))^1/219)))))

Input interpretation:

$$27\times 4+10^3\times\frac{1}{2}\left(\frac{1}{\sqrt[220]{1.35334191664259842300157\times 10^{-46}}}+\frac{1}{\sqrt[219]{1.35334191664259842300157\times 10^{-46}}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1725.967805714668735089584...

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

((((((27*4 + 10^3 * 1/2 (((((1/ ((1.3533419166425984230015 7 × 10^-46))^1/220 + 1/ ((1.35334191664259842300157 × 10^-46))^1/219)))))))))))^1/3

Input interpretation:

$$\left(27\times4+10^3\times\frac{1}{2}\left(\frac{1}{\sqrt[220]{1.35334191664259842300157\times10^{-46}}}+\frac{1}{\sqrt[219]{1.35334191664259842300157\times10^{-46}}}\right)\right)\hat{}\,(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

11.995294001267646522761110 4...

This result is very near to the value of black hole entropy 12,1904

2 * ((((((27*4 + 10^3 * 1/2 (((((1/ ((1.35334191664259842300157 × 10^-46))^1/220 + 1/ ((1.35334191664259842300157 × 10^-46))^1/219)))))))))))^1/3

Input interpretation:

$$2\left(27\times4+10^3\times\frac{1}{2}\left(\frac{1}{\sqrt[220]{1.35334191664259842300157\times10^{-46}}}+\frac{1}{\sqrt[219]{1.35334191664259842300157\times10^{-46}}}\right)\right)\hat{}\,(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

23.990588002535293045522220 9...

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

((((((27*4 + 10^3 * 1/2 (((((1/ ((1.3533419166425984230015 7 × 10^-46))^1/220 + 1/ ((1.3533419166425984230015 7 × 10^-46))^1/219))))))))))^1/15

Input interpretation:

$$\left(27\times 4+10^3\times\frac{1}{2}\left(\frac{1}{\sqrt[220]{1.35334191664259842300157\times 10^{-46}}}+\frac{1}{\sqrt[219]{1.35334191664259842300157\times 10^{-46}}}\right)\right)\text{^}(1/15)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6436228843880182831869104 10...

1.6436228843880182831869104 10

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Possible closed forms:

- Less

$\frac{4574027289\pi}{8742717484} \approx 1.64362288438801828319445 3$

Enlarge Data Customize A Plaintext Interactive

$\frac{100\sqrt[3]{\frac{83077690}{20243211}}}{\pi^4} \approx 1.6436228843880183101 3$

$\frac{322217\pi^2 - 2385090}{153975\pi} \approx 1.6436228843880182830959 8$

$\frac{3(-27 - 220\pi + 252\pi^2)}{657 + 627\pi + 61\pi^2} \approx 1.643622884388018282626 4$

π (root of $33497x^3 + 46721x^2 - 3250x - 15885$ near $x = 0.523181$) $\approx$ 1.64362288438801828318 13991

(root of $195x^5 - 32x^4 - 296x^3 - 405x^2 + 208x - 39$ near $x = 1.64362$) $\approx$ 1.643622884388018283 23556

π (root of $234x^5 - 15x^4 + 193x^3 + 480x^2 + 342x - 346$ near $x = 0.523181$) $\approx$ 1.6436228843880182831 66376

(root of $167x^4 - 5482x^3 + 3926x^2 + 7151x + 763$ near $x = 1.64362$) $\approx$ 1.64362288438801828319 3680

(root of $20428x^3 - 38193x^2 + 36568x - 47631$ near $x = 1.64362$) $\approx$ 1.64362288438801828318 94207

π (root of $1676x^4 + 4308x^3 + 301x^2 - 3748x + 1136$ near $x = 0.523181$) $\approx$ 1.643622884388018283 08652

$\frac{1}{\text{root of } 763x^4 + 7151x^3 + 3926x^2 - 5482x + 167 \text{ near } x = 0.608412}$ $\approx$ 1.64362288438801828319 3680

Now, from:

where we will assume only particles of minimum BPS mass are emitted. Now the energy loss rate by neutral emission is

$$\frac{d\Delta E}{dt}_{neut} \approx \frac{3\zeta(5)}{\pi^2} A_h T_{II}^5. \qquad (75)$$

We obtain:

(3 * zeta (5) / Pi^2) * (4.7581443158086875924 * 10^27) * ((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))))))^5

Input interpretation:

$$\left(3\times\frac{\zeta(5)}{\pi^2}\right)(4.7581443158086875924\times10^{27})\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^5$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$7.0596416991722628168207718657223178676483108561688826\ldots\times10^{-48}$

$7.0596416991722628168207718657223178676483108561\times10^{-48}$

From the ratio of (85) and (75), we obtain:

((((((((zeta (3)/30) * (4.7581443158 * 10^27) * [((((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))]^4 * ((((2.0556355429 × 10^-13)))) * (((1 /7.059641699*10^-48)))

Input interpretation:

$$\frac{\zeta(3)}{30}(4.7581443158\times10^{27})\left(\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^4\times 2.0556355429\times10^{-13}\times\frac{1}{7.059641699\times10^{-48}}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

19.170121859952544673927929541027980287012908920542400290 19...

19.170121859952544673927929541027980287012908920542400

And:

((((((((((((((zeta (3)/30) * (4.7581443158 * 10^27) * (((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))^4 * ((((2.0556355429 × 10^-13)))) * (((1 /7.059641699*10^-48))))))))))^1/6

Input interpretation:

$$\left(\frac{\zeta(3)}{30}\left(4.7581443158\times10^{27}\right)\left(\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^4\times 2.0556355429\times10^{-13}\times\frac{1}{7.059641699\times10^{-48}}\right)\right)^\wedge(1/6)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.635952961520542934727971866777290267626333463559848658 90...

1.6359529615205429347279718667772902676263334635598 48

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{19+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{52+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$e^{5+2/e+13e+25/\pi+30\pi}\,\pi^{-11-44e}\tan^{13}(e\pi)\sec^9(e\pi)\approx 1.63595296152054293 12162$

$\frac{510078227\pi}{979525725}\approx 1.63595296152054293 456316$

$\frac{6}{11}\pi\sin^2\left(\frac{3622963}{2671223}\right)\approx 1.63595296152054293 54459$

Moreover:

((((((((zeta (3)/30) * (4.7581443158 * 10^27) * (((((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))^4 * (((2.0556355429 × 10^-13))) * ((1 /7.059641699*10^-48))))))))^(e*Pi lnPi/60)

Input interpretation:

$$\left(\frac{\zeta(3)}{30}\left(4.7581443158\times10^{27}\right)\left(\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^4\times 2.0556355429\times10^{-13}\times\frac{1}{7.059641699\times10^{-48}}\right)\right)^{e\,\pi\times\log(\pi)/60}$$

Open code

- $\zeta(s)$ is the Riemann zeta function
- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.617989494396484474773260312716906576110188897487522783427...

1.6179894943964844747732603127169065761101888974875227

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{254+\cfrac{1}{18+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- Less

$$\frac{34\,667\,718\,\pi}{67\,313\,075}\approx 1.6179894943964844\textcolor{gray}{81942}$$

$$-\frac{4\left(66+161\,e+41\,e^2\right)}{-593-616\,e+37\,e^2}\approx 1.61798949439648447\textcolor{gray}{441903}$$

$$\frac{3340003735\,\pi}{6485166457} \approx 1.61798949439648447474 5838$$

$$\text{root of } 256x^4 + 344x^3 - 128x^2 - 5106x + 5385 \text{ near } x = 1.61799 \approx 1.6179894943964844747 32912$$

$$\text{root of } 16018x^3 - 7209x^2 - 40333x + 16283 \text{ near } x = 1.61799 \approx 1.6179894943964844747 84760$$

$$\frac{1}{\text{root of } 5385x^4 - 5106x^3 - 128x^2 + 344x + 256 \text{ near } x = 0.618051} \approx 1.6179894943964844747 32912$$

$$\frac{1}{6}\left(-45 + 15e + 15e^2 + 57\sqrt{1+e} - 71\pi + 42\sqrt{1+\pi} - 21\sqrt{1+\pi^2}\right) \approx 1.617989494396484474 68558$$

$$\pi \,\text{root of } 40953x^3 - 58025x^2 + 75454x - 29064 \text{ near } x = 0.515022 \approx 1.6179894943964844747 7704924$$

$$\frac{1}{\text{root of } 16283x^3 - 40333x^2 - 7209x + 16018 \text{ near } x = 0.618051} \approx 1.6179894943964844747 84760$$

$$\text{root of } 305x^5 - 797x^4 + 998x^3 - 731x^2 - 394x + 404 \text{ near } x = 1.61799 \approx 1.617989494396484474 80237$$

$$\pi \,\text{root of } 9762x^4 + 4142x^3 + 1652x^2 + 2041x - 2742 \text{ near } x = 0.515022 \approx 1.61798949439648447477 55262$$

$$\pi \,\text{root of } 108x^5 + 1107x^4 + 143x^3 - 1345x^2 + 694x - 102 \text{ near } x = 0.515022 \approx 1.61798949439648447477 13707$$

$$\frac{110592\sqrt[6]{2}\; 3^{41/84} \log^{11/42}(2) \log^{73/14}(3)}{e^{341/28}} \approx 1.617989494396484474 12677$$

$$\frac{e^{-\frac{1}{23}+\frac{1}{e}-\frac{7e}{46}-\frac{24}{23\pi}-\frac{3\pi}{46}}\, \pi^{(37e)/46-43/46}\, (-\cos(e\pi))^{35/46}}{\sin^{2/23}(e\pi)} \approx 1.617989494396484474 64471$$

$$\frac{1127 - 216\pi + 264\pi^2}{-495 - 71\pi + 264\pi^2} \approx 1.617989494396484474 60439$$

•

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

And:

24*4+ 10^3(((((((zeta (3)/30) * (4.7581443158 * 10^27) * (((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^4 * ((2.0556355429 × 10^-13)) * ((1 /7.059641699*10^-48))))))))))^1/6

Input interpretation:

$$24 \times 4 + 10^3 \left(\frac{\zeta(3)}{30} (4.7581443158 \times 10^{27}) \left(\left(\left(\frac{1}{12} \times \frac{1}{\pi \times \frac{2 \times 6.67 \times 10^{-11} \times 13.12806 \times 10^{39}}{9 \times 10^{16}}}\right)^4 \times 2.0556355429 \times 10^{-13} \times \frac{1}{7.059641699 \times 10^{-48}}\right)\right) \hat{} (1/6)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1731.952961520542934727971866777729026762633346355984865890...

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

((((((((96+10^3*((((zeta (3)/30) * (4.7581443158 * 10^27) * (((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^4 * (2.0556355429 × 10^-13) * (1 /7.059641699*10^-48))))))))^1/6])))^1/3

Input interpretation:

$$\left(96 + 10^3 \left(\frac{\zeta(3)}{30} (4.7581443158 \times 10^{27}) \left(\left(\left(\frac{1}{12} \times \frac{1}{\pi \times \frac{2 \times 6.67 \times 10^{-11} \times 13.12806 \times 10^{39}}{9 \times 10^{16}}}\right)^4 \times 2.0556355429 \times 10^{-13} \times \frac{1}{7.059641699 \times 10^{-48}}\right)\right) \hat{} (1/6)\right)\right) \hat{} (1/3)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

12.0091...

This result is very near to the value of black hole entropy 12,1904

2((((((((96+10^3*((((zeta (3)/30) * (4.7581443158 * 10^27) * (((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^4 * (2.0556355429 × 10^-13) * (1 /7.059641699*10^-48))))))))^1/6])))^1/3

Input interpretation:

$$2\left(96+10^3\left(\frac{\zeta(3)}{30}\left(4.7581443158\times10^{27}\right)\left(\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^4\times 2.0556355429\times10^{-13}\times\frac{1}{7.059641699\times10^{-48}}\right)\text{^}(1/6)\right)\right)\text{^}(1/3)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

24.0183...

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

(((((((((96+10^3*((((zeta (3)/30) * (4.7581443158 * 10^27) * (((((1/12 * 1/(((Pi*(2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))^4 * (2.0556355429 × 10^-13) * (1 /7.059641699*10^-48))))))))^1/6]))))^1/15

Input interpretation:

$$\left(96+10^3\left(\frac{\zeta(3)}{30}\left(4.7581443158\times10^{27}\right)\left(\left(\frac{1}{12}\times\frac{1}{\pi\times\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}\right)^4\times 2.0556355429\times10^{-13}\times\frac{1}{7.059641699\times10^{-48}}\right)\text{^}(1/6)\right)\right)\text{^}(1/15)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.644002244693740601245065635790950580474976059523708741174...

1.6440022446937406012450656357909505804749760595237087

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{24+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{26+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\cot\left(\cot\left(\frac{41994802}{13862273}\right)\right) \approx 1.64400224469374063676\,6$$

$$\frac{5\sqrt{\frac{2538955}{2379526}}}{\pi} \approx 1.644002244693740536\,59$$

$$\text{root of } 894x^3 + 8963x^2 - 75551x + 96009 \text{ near } x = 1.644 \approx 1.644002244693740601236981$$

-

Hawking said, (see eq.83-84-85):

...Thus we find that emission of KK charged scalars dominates neutral emission, independently of the moduli, for any near extremal state with n_K very large. Thus we find that, although the absolute rates of energy emission by the black hole are moduli dependent, the relative rates of neutral and charged emission depend only on the integral charges and horizon potentials.

Mathematical connections between the Ramanujan Mock Theta Functions and the result of Cardy formula:

$1.0828815996251415942796175621426552475613218358896948 * 10^{81}$

We remember that:

For $q = -e^{-t}$, $t = 0.5$ $q^n = -21.79216 * -e^{-0.5}$, we obtain:

$$\phi(q) = 1 + \frac{q}{1+q^2} + \frac{q^4}{(1+q^2)(1+q^4)} + \ldots$$

$$\psi(q) = \frac{q}{1-q} + \frac{q^4}{(1-q)(1-q^3)} + \frac{q^9}{(1-q)(1-q^3)(1-q^5)} + \ldots$$

$$\chi(q) = 1 + \frac{q}{1-q+q^2} + \frac{q^4}{(1-q+q^2)(1-q^2+q^4)} + \ldots$$

Where

ψ(q) = -1.08185 + 1.08232 – 1.08232 = – 1.08185 or:

ψ(q) = 1.08185 - 1.08232 + 1.08232 = 1.08185

Indeed:

((-e^-(0.5)*(-21.79216))/((1-((((-e^(-0.5)*(-21.79216))))

Input interpretation:

$$-\frac{e^{-0.5} \times (-21.79216)}{1 - -\frac{-21.79216}{e^{0.5}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1.08185\ldots$

Alternative representation:

$$-\frac{e^{-0.5}(-21.7922)}{1--\frac{-21.7922}{e^{0.5}}} = -\frac{\exp^{-0.5}(z)(-21.7922)}{1--\frac{-21.7922}{\exp^{0.5}(z)}} \quad \text{for } z = 1$$

Open code

- More information

Series representations:

- More

$$-\frac{e^{-0.5}(-21.7922)}{1--\frac{-21.7922}{e^{0.5}}} = \frac{21.7922}{-21.7922+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-\frac{e^{-0.5}(-21.7922)}{1--\frac{-21.7922}{e^{0.5}}} = \frac{30.8188}{-30.8188+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}}$$

Open code

$$-\frac{e^{-0.5}(-21.7922)}{1--\frac{-21.7922}{e^{0.5}}} = \frac{21.7922}{-21.7922+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}}$$

(((-e^-(0.5)*(-21.79216))^4))) / ((((((1-((((-e^(-0.5)*(-21.79216)))^1))) (((1-((((-e^(-0.5)*(-21.79216)))^3))))))

Input interpretation:

$$\frac{\left(-e^{-0.5}\times(-21.79216)\right)^4}{\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^3\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.08232...

Alternative representation:

$$\frac{\left(-e^{-0.5}(-1)\,21.7922\right)^4}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{\left(-\exp^{-0.5}(z)(-1)\,21.7922\right)^4}{\left(1-\left(-\frac{-21.7922}{\exp^{0.5}(z)}\right)^1\right)\left(1-\left(-\frac{-21.7922}{\exp^{0.5}(z)}\right)^3\right)} \quad \text{for } z = 1$$

Open code

Series representations:

- More

$$\frac{\left(-e^{-0.5}\,(-1)\,21.7922\right)^4}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{225\,528.}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}\right)\left(-10\,349.1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{1.5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(-e^{-0.5}\,(-1)\,21.7922\right)^4}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{902\,113.}{\left(-30.8188+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}\right)\left(-29\,271.6+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{1.5}\right)}$$

Open code

$$\frac{\left(-e^{-0.5}\,(-1)\,21.7922\right)^4}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{225\,528.}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}\right)\left(-10\,349.1+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{1.5}\right)}$$

(((-e^-(0.5)*(-21.79216))^9))) / (((((((1-((((-e^(-0.5)*(-21.79216)))^1))) (((1-((((-e^(-0.5)*(-21.79216)))^3))) (((1-((((-e^(-0.5)*(-21.79216)))^5))))))

Input interpretation:

$$\frac{\left(-e^{-0.5}\times(-21.79216)\right)^9}{\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^1\right)\left(\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^3\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^5\right)\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1.08232\ldots$

Alternative representation:

$$\frac{\left(-e^{-0.5}\,(-1)\,21.7922\right)^9}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^5\right)} = \frac{\left(-\exp^{-0.5}(z)\,(-1)\,21.7922\right)^9}{\left(1-\left(-\frac{-21.7922}{\exp^{0.5}(z)}\right)^1\right)\left(1-\left(-\frac{-21.7922}{\exp^{0.5}(z)}\right)^3\right)\left(1-\left(-\frac{-21.7922}{\exp^{0.5}(z)}\right)^5\right)} \text{ for } z=1$$

Series representations:

- More

$$\frac{(-e^{-0.5}(-1)\,21.7922)^9}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^5\right)} = \frac{1.10842\times 10^{12}}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}\right)\left(-10\,349.1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{1.5}\right)\left(-4.91475\times 10^6+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{2.5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{(-e^{-0.5}(-1)\,21.7922)^9}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^5\right)} =$$
$$2.50806\times 10^{13} \Big/ \left(\left(-30.8188+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}\right)\left(-29\,271.6+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{1.5}\right)\left(-2.7802\times 10^7+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{2.5}\right)\right)$$

Open code

$$\frac{(-e^{-0.5}(-1)\,21.7922)^9}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^5\right)} =$$
$$1.10842\times 10^{12} \Big/ \left(\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}\right)\left(-10\,349.1+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{1.5}\right)\left(-4.91475\times 10^6+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{2.5}\right)\right)$$

We note that, from the following Mock Theta Function (that is the result of ψ(q) with minus sign):

ψ(q) = 1.08185 - 1.08232 + 1.08232 = 1.08185

the value obtained 1,08185 is a sub-multiple and is just half of the Cardy formula, i.e. $1.0828815996251415942796175621426552475613218358 8 \times 10^{81}$

Indeed:

-(((((((-e^-(0.5)*(-21.79216))/((1-((((-e^(-0.5)*(-21.79216))))))))) * 10^81

Input interpretation:

$$-\left(-\frac{e^{-0.5}\times(-21.79216)}{1--\frac{-21.79216}{e^{0.5}}}\times 10^{81}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.08185\ldots \times 10^{81}$

Series representations:

- More

$$-\frac{\left(-e^{-0.5}(-21.7922)\right)10^{81}}{1-\frac{-21.7922}{e^{0.5}}} = -\frac{2.17922\times 10^{82}}{-21.7922+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-\frac{\left(-e^{-0.5}(-21.7922)\right)10^{81}}{1-\frac{-21.7922}{e^{0.5}}} = -\frac{3.08188\times 10^{82}}{-30.8188+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}}$$

Open code

$$-\frac{\left(-e^{-0.5}(-21.7922)\right)10^{81}}{1-\frac{-21.7922}{e^{0.5}}} = -\frac{2.17922\times 10^{82}}{-21.7922+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}}$$

The result $1.08185 * 10^{81}$ is very near to the above described value (Cardy formula)

Moreover we have that:

((((((((((((-e^-(0.5)*(-21.79216))/((1-((((-e^(-0.5)*(-21.79216))))))) * 10^81)))))^6

Input interpretation:

$$\left(-\frac{e^{-0.5}\times(-21.79216)}{1-\frac{-21.79216}{e^{0.5}}}\times 10^{81}\right)^6$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$1.6032453978877785334468482638727968441412222708953959\ldots \times 10^{486}$

$1.603245397887778533446848263872796844141222708 \times 10^{486}$

This result is a good approximation to the previous expression, i.e.:

((1.0828815996251415942796175621426552475613218358 8 × 10^81))^6

$(1.08288159962514159427961756214265524756132183588 \times 10^{81})^6$:

$1.612448473080299394897863234922793584313793 19686 \times 10^{486}$

$1.612448473080299394897863234922793584313793 19686 \times 10^{486}$

Indeed, we have:

$1.603245397887 * 10^{486} \approx 1.612448473080 * 10^{486}$

This is a further confirm that the mathematics of the Ramanujan's Mock Theta Function is linked to the black holes physics and mathematics

We have also that:

For $q = -e^{-t}$, $t = 0.5$ $q^n = -21.79216 * -e^{-0.5}$

Mock ϑ-functions (of 5th order)

$$
\begin{aligned}
f(q) &= 1+\frac{q}{1+q^2}+\frac{q^4}{(1+q)(1+q^2)}+\frac{q^9}{(1+q)(1+q^2)(1+q^3)}+\dots \\
\phi(q) &= 1+q(1+q)+q^4(1+q)(1+q^3)+q^9(1+q)(1+q^3)(1+q^5)+\dots \\
\psi(q) &= q+q^3(1+q)+q^6(1+q)(1+q^2)+q^{10}(1+q)(1+q^2)(1+q^3)+\dots \\
\chi(q) &= 1+\frac{q}{1-q^2}+\frac{q^2}{(1-q^3)(1-q^4)}+\frac{q^3}{(1-q^4)(1-q^5)(1-q^6)}+\dots \\
&= 1+\left\{\frac{q}{1-q}+\frac{q^3}{(1-q^2)(1-q^3)}+\frac{q^5}{(1-q^3)(1-q^4)(1-q^5)}+\dots\right\}
\end{aligned}
$$

$$F(q) = 1+\frac{q^2}{1-q}+\frac{q^8}{(1-q)(1-q^3)}+\dots$$

χ(q) = 1+(-1.08185)+(0.00575937)+(-1.41949 × 10^-8) = -0.0760906441949

= 1+(-0.0760922)+(2.47992 × 10^-6)+(-3.51705 × 10^-14) =

= 0.92391027991996 48295

F(q) = 1+(-14.2995)+(33034.4) = 33021.1005

Indeed, we have:

((-e^-(0.5)*(-21.79216))^2 / ((1-((((-e^(-0.5)*(-21.79216))))

Input interpretation:

$$\frac{\left(-e^{-0.5}\times(-21.79216)\right)^2}{1--\frac{-21.79216}{e^{0.5}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-14.2995...$

Series representations:

- More

$$\frac{\left(-e^{-0.5}(-1)\,21.7922\right)^2}{1--\frac{-21.7922}{e^{0.5}}} = \frac{474.898}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}\right)\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(-e^{-0.5}(-1)\,21.7922\right)^2}{1--\frac{-21.7922}{e^{0.5}}} = \frac{949.796}{\left(-30.8188+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}\right)\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}}$$

Open code

$$\frac{\left(-e^{-0.5}(-1)\,21.7922\right)^2}{1--\frac{-21.7922}{e^{0.5}}} = \frac{474.898}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}\right)\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}}$$

And:

(((-e^-(0.5)*(-21.79216))^8))) / ((((((1-((((-e^(-0.5)*(-21.79216)))^1))) (((1-((((-e^(-0.5)*(-21.79216)))^3))))))

Input interpretation:

$$\frac{\left(-e^{-0.5}\times(-21.79216)\right)^8}{\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^3\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$33034.4...$

Series representations:

- More

$$\frac{(-e^{-0.5}(-1)\,21.7922)^8}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{5.0863\times 10^{10}}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{0.5}\right)\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^2\left(-10\,349.1+\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{1.5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{(-e^{-0.5}(-1)\,21.7922)^8}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{8.13808\times 10^{11}}{\left(-30.8188+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{0.5}\right)\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^2\left(-29\,271.6+\left(\sum_{k=0}^{\infty}\frac{1+k}{k!}\right)^{1.5}\right)}$$

Open code

$$\frac{(-e^{-0.5}(-1)\,21.7922)^8}{\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^1\right)\left(1-\left(-\frac{-21.7922}{e^{0.5}}\right)^3\right)} = \frac{5.0863\times 10^{10}}{\left(-21.7922+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{0.5}\right)\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^2\left(-10\,349.1+\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{1.5}\right)}$$

From the sum and some calculations of the following results previously obtained:

1.6437054117109906287118513162925192895843265089290 9035

1.6487212707001281468486507878141635716537761007101480

1.6442109004131825039227356463880273603048609587634042

1.6435923980586093145799367873492901635775398091369341

1.6429804873354…

1.6438187787578943564494183488914510895650008348787332

1.6437161856103091607910999662475235481706517783810713

1.6477158283216220606108224071415601414977900114636670

1.6439678304095125067795096413127798499015244293562323

1.6437859005782310620161084756021656195303526362348984

1.6437720382919401759948

1.64388

1.6438818674889841177750602517568866101168218651016596

We obtain:
21,37774889433

From:

(21.37774889433)^(Pi/20)

We obtain:
Input interpretation:
$21.37774889433^{\pi/20}$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

1.6177445222553...
Series representations:
- More

$21.377748894330000^{\pi/20} = 21.377748894330000^{1/5 \sum_{k=0}^{\infty} (-1)^k/(1+2k)}$
Open code

Enlarge Data Customize A Plaintext Interactive

$21.377748894330000^{\pi/20} = 0.736213544038280895\, e^{0.306235060979764 45 \times \sum_{k=1}^{\infty} 2^k/\binom{2k}{k}}$
Open code

$21.377748894330000^{\pi/20} = 21.377748894330000^{1/20 \sum_{k=0}^{\infty} \left(2^{-k}(-6+50k)\right)/\binom{3k}{k}}$
Open code

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

Integral representations:
- More

$$21.3777488943300000^{\pi/20} = e^{0.30623506097976445 \int_0^\infty 1/(1+t^2)\,dt}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$21.3777488943300000^{\pi/20} = e^{0.61247012195952890 \int_0^1 \sqrt{1-t^2}\,dt}$$

Open code

$$21.3777488943300000^{\pi/20} = e^{0.30623506097976445 \int_0^\infty \sin(t)/t\,dt}$$

Open code

-

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{18+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$-e^{6+1/e-(10\,e)/3+(10\,\pi)/3}\,\pi^{1/3-2\,e}\,\sqrt[3]{\sin(e\,\pi)}\,\cos^3(e\,\pi) \approx 1.61774452225512045$$

$$\frac{4898922\,\pi}{9513503} \approx 1.61774452225305650$$

$$-\frac{\mathcal{K}_{-6}+300}{2\,(255\,\mathcal{K}_{-6}-388)} \approx 1.61774452225221264$$

- $\mathcal{K}_{-6}$ is the Khinchin mean of order −6

This result 1.6177445222553...is a very good approximation to the value of golden ratio

In conclusion, we have:

Working in the Reissner-Nordstrom sector, neutral emission will dominate until the ratio of rates in (77) is approximately one; but when this happens, the remaining excess energy is

$$\Delta E \sim \frac{n^{5/2} e^{\ 2\pi\sqrt{n}}}{r_e}, \tag{90}$$

which compares to an energy scale set by the uncertainty principle of

$$E_{uncert} \sim \frac{1}{n^{3/2} r_e}, \tag{91}$$

which is much larger. That is, before charged emission can become significant, the excess energy falls below the uncertainty in energy of the BPS state (and the statistical approximations implicit in our rates break down).

for n = 576, r_e = ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))) =

= (1.945870226666 × 10^13)

We obtain, from (90):

((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))

Input interpretation:

$$576^{5/2} \times \frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.32397... \times 10^{-72}$

1.32397×10^{-72}

And:

10^5 * (((((((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))^1/15

Input interpretation:

$$10^5 \sqrt[15]{576^{5/2} \times \frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.614823856240176985832822788467770147033581865419248798894...

1.6148238562401769858328227884677701470335818654192487

1 / (((((((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16)))))))))^1/(((18+(27/50))^2)))

Input interpretation:

$$\frac{1}{\left(18+\frac{27}{50}\right)^2\sqrt{576^{5/2}\times\frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.618494344964677157721906394455796001798894357732951451487...

1.618494344964677157721906394455796001798894357732951

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$\frac{2150415927\pi}{4174083709} \approx 1.61849434496467715775437 9$

$\log\left(\frac{1}{40}\left(-209 e + 53 e^2 + 2\left(61 - 59\sqrt{2} + 237\pi - 54\pi^2\right)\right)\right) \approx$
1.6184943449646771574571 8

root of $1507 x^3 + 17804 x^2 - 64431 x + 51254$ near $x = 1.61849$ $\approx$
1.6184943449646771574718 0

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

We obtain, from (91)

1/ ((((((576^(3/2))*((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))

Input interpretation:

$$\frac{1}{576^{3/2}\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

$3.7175121943707436291193178522979009091591028966818473... \times 10^{-18}$
Open code
$3.7175121943707436291193178522979009091591028966818473 \times 10^{-18}$

And:

1/ ((((((1/ ((((((576^(3/2))*((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))))^(Pi/262)

Input interpretation:

$$\frac{1}{\left(\frac{1}{576^{3/2}\times\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}\right)^{\pi/262}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- Fewer digits
- More digits

1.6180681921430000025303833519837542067766701492987368 59850...
1.6180681921430000025303833519837542067766701492987368

Continued fraction:
- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More
  $\frac{1153715173\,\pi}{2240018764} \approx 1.61806819214300000263174$

  $\text{root of } 52x^4 + 1828x^3 - 2846x^2 + 718x - 1811 \text{ near } x = 1.61807 \approx$
  $1.6180681921430000025433 47$

  $\text{root of } 44929x^3 - 62494x^2 + 4946x - 34719 \text{ near } x = 1.61807 \approx$
  $1.61806819214300000253200 52$

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

From (90), we obtain also:

27*4 + 10^3 / ((((((((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))))^1/(((18+(27/50))^2)))

Input interpretation:

$$27\times4+\frac{10^3}{\sqrt[\left(18+\frac{27}{50}\right)^2]{576^{5/2}\times\frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times6.67\times10^{-11}\times13.12806\times10^{39}}{9\times10^{16}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
1726.4943...

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

And:

((((((((((27*4 + 10^3 / (((((((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))^1/(((18+(27/50))^2)))))))))))))^1/3

Input interpretation:

$$\sqrt[3]{27\times 4+\frac{10^3}{\sqrt[\left(18+\frac{27}{50}\right)^2]{576^{5/2}\times\frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
11.9965137...

This result is very near to the value of black hole entropy 12,1904

2*((((((((((27*4 + 10^3 / (((((((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))^1/(((18+(27/50))^2)))))))))))))^1/3

Input interpretation:

$$2\sqrt[3]{27\times 4+\frac{10^3}{\sqrt[\left(18+\frac{27}{50}\right)^2]{576^{5/2}\times\frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits

23.9930273...

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

((((((((((27*4 + 10^3 / (((((((((576^(5/2) * exp(((-2Pi * sqrt(576)))) / ((((2*6.67*10^-11*13.12806*10^39)/(9*10^16))))))))^1/(((18+(27/50))^2))))))))))))^1/15

Input interpretation:

$$\sqrt[15]{27\times 4+\frac{10^3}{\left(18+\frac{27}{50}\right)^2\sqrt{576^{5/2}\times\frac{\exp\left(-2\pi\sqrt{576}\right)}{\frac{2\times 6.67\times 10^{-11}\times 13.12806\times 10^{39}}{9\times 10^{16}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.643656307521192885392461806766318993567547829108894733676...

1.643656307521192885392461806766318993567547829108894 7

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{13+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{19+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Possible closed forms:

- More

$$\frac{655\,\pi\,\pi! - 8600 - 2355\,\pi + 149\,\pi^2}{51\,\pi} \approx 1.643656307521192885 68569$$

π [root of $222\,x^5 - 930\,x^4 - 179\,x^3 - 82\,x^2 + 132\,x + 40$ near $x = 0.523192$] $\approx$

1.6436563075211928853 74586

$$\frac{5\,324\,844\,513\,\pi}{10\,177\,609\,715} \approx 1.6436563075211928853 79993$$

Conclusions

As we can see, the results of the present thesis are particle-type solutions (glueball with the average value of its mass, mesons, baryon, etc...), values of black holes entropies, π and ϕ approximations. Many solutions of our mathematical expressions are golden numbers, numbers that are in the range that goes from 1.6 to 1,675, then an interval of the value of golden ratio: 1.61803398. These values of the solutions, which are results from the study and development of some equations inherent the black holes physics, mainly the solutions that provide golden numbers or the golden ratio itself and the π approximations, let us suppose that the multiverse is based on these two wonderful mathematical constants: π and ϕ

Appendix A

From:

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RAMANUJAN'S CLASS INVARIANTS, KRONECKER'S LIMIT FORMULA, AND MODULAR EQUATIONS

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Theorem 4.11.

$$G_{505} = (\sqrt{5}+2)^{1/2}\left(\frac{\sqrt{5}+1}{2}\right)^{1/4}(\sqrt{101}+10)^{1/4} \times \left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^{1/2}.$$

Proof. We compose the following table.

d_1	d_2	χ	$\boldsymbol{G}$	C	$\chi(\boldsymbol{G}_0)$ $\chi(\boldsymbol{G}_2)$	$\chi(\boldsymbol{G}_1)$ $\chi(\boldsymbol{G}_3)$	h_1	h_2	w_2	ϵ_1
1	-2020	χ_0	$\boldsymbol{G}_0$	$[1,\Omega]$ $[5,\Omega]$	$\mathbf{1}$ $\mathbf{1}$	1 1				
5	-404	χ_1	$\boldsymbol{G}_1$	$[2,1+\Omega]$ $[10,5+\Omega]$	$\mathbf{1}$ $\mathbf{1}$	-1 -1	1	14	2	$\frac{\sqrt{5}+1}{2}$
101	-20	χ_2	$\boldsymbol{G}_2$	$[11,1+\Omega]$ $[11,-1+\Omega]$	$\mathbf{1}$ $\mathbf{-1}$	-1 1	1	2	2	$\sqrt{101}+10$
505	-4	χ_3	$\boldsymbol{G}_3$	$[22,1+\Omega]$ $[22,-1+\Omega]$	$\mathbf{1}$ $\mathbf{-1}$	1 -1				

Hence, 505 is of the second kind. Applying Theorem 3.2 with $h=8$ and $w=2$, we find that

$$P^{-2} := (G_{505}G_{101/5})^4 = \left(\frac{\sqrt{5}+1}{2}\right)^{14}(\sqrt{101}+10)^2,$$

so that

$$P^{-1} = \left(\frac{\sqrt{5}+1}{2}\right)^{7}(\sqrt{101}+10) = (\sqrt{5}+2)\left(\frac{\sqrt{5}+1}{2}\right)^{4}(\sqrt{101}+10)$$

$$= (\sqrt{5}+2)\left(\frac{7+3\sqrt{5}}{2}\right)(\sqrt{101}+10). \tag{4.35}$$

Let $Q=(G_{505}/G_{101/5})^3$. Then, by Lemma 3.4 and (4.35),

$$Q = (P^{-1}-P)+\sqrt{(P^{-1}-P)^2-1}$$

$$= (130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}}. \tag{4.36}$$

Therefore, by (4.35) and (4.36),

$$G_{505} = P^{-1/4}Q^{1/6} = (\sqrt{5}+2)^{1/2}\left(\frac{\sqrt{5}+1}{2}\right)^{1/4}(\sqrt{101}+10)^{1/4} \times \left((130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}}\right)^{1/6}.$$

Thus, it remains to show that

$$(130\sqrt{5}+29\sqrt{101})+\sqrt{169440+7540\sqrt{505}} = \left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^{3},$$

which is straightforward. □

From:

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

Spyros D. Avramis, Alex Kehagiasb and Constantina Mattheopoulou

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

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

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EVOLUTION OF NEAR-EXTREMAL BLACK HOLES
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(February 1, 2008)

S. Ramanujan to G.H. Hardy 12 January 1920 - University of Madras

https://www.imsc.res.in/~rao/ramanujan/newnow/lastletter.pdf