On the Ramanujan's Mock ϑ-functions of his last letter: mathematical connections with some expressions concerning the mass of some particles, the Black Hole entropy and the hypothetical mass of Dark Matter particles. II

Michele Nardelli[1], Antonio Nardelli

Abstract

In this research paper we have obtained some interesting mathematical connections between the Mock Theta functions of the Ramanujan's last letter and some expressions concerning the mass of some particles, the black hole entropy and the hypothetical mass of Dark Matter particles

From:

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

https://www.cse.iitk.ac.in/users/amit/books/hardy-1999-ramanujan-twelve-lectures.html

"I am extremely sorry for not writing you a single letter up to now . . . I discovered very interesting functions recently which I call "Mock" ϑ-functions. Unlike the "False" ϑ-functions (studied partially by Prof. Rogers in his interesting paper) they enter into mathematics as beautifully as the ordinary ϑ-function. I am sending you with this letter some examples . . ." (S. Ramanujan)

"For Ramanujan an equation does not make sense, unless it expresses a thought of God. For this the Indian elaborated a theory of reality around the Zero (representing the Absolute Reality) and the Infinite (the multiple manifestations of that reality): their mathematical product represented all the numbers, each of which corresponded to individual acts of creation.... For him "the numbers and their mathematical relationships let us understand how in the universe everything was in harmony" (from: http://stagingcittanuova.glauco.it/ramanujanhardy-e-il-piacere-di-scoprire/)

We have that:

When $q = -e^{-t}$ and $t \to 0$

$$f(q) + \sqrt{\frac{\pi}{t}} \exp\left(\frac{\pi^2}{24t} - \frac{t}{24}\right) \to 4.$$

The coefficient of q^n in $f(q)$ is

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

Now:

From J. Polchinski "String Theory Vol II":

Useful facts for grand unification

The exceptional group E_8 is connected to the groups appearing in grand unification through a series of subgroups. This will play a role in the com-

Table 11.3. *Dimensions and Coxeter numbers for simple Lie algebras.*

	$SU(n)$	$SO(n)$, $n \geq 4$	$Sp(k)$	E_6	E_7	E_8	F_4	G_2
$\dim(g)$	n^2-1	$n(n-1)/2$	$2k^2+k$	78	133	248	52	14
$h(g)$	n	$n-2$	$k+1$	12	18	30	9	4

pactification of the heterotic string, and so we record without derivation the necessary results.

The first subgroup is

$$E_8 \to SU(3) \times E_6 \,. \tag{11.4.23}$$

We have not described E_6 explicitly, but the reader can reproduce this and the decomposition (11.4.24) from the known properties of spinor representations, as well as the further decomposition of the E_6 representations in table 11.4 (exercise 11.5). In simple compactifications of the $E_8 \times E_8$ string, the fermions of the Standard Model can all be thought of as arising from the **248**-dimensional adjoint representation of one of the E_8s. It is therefore interesting to trace the fate of this representation under the successive symmetry breakings. Under $E_8 \to SU(3) \times E_6$,

$$\mathbf{248} \to (\mathbf{8},\mathbf{1}) + (\mathbf{1},\mathbf{78}) + (\mathbf{3},\mathbf{27}) + (\bar{\mathbf{3}},\overline{\mathbf{27}}) \,. \tag{11.4.24}$$

That is, the adjoint of E_8 contains the adjoints of the subgroups, with half the remaining 162 generators transforming as a triplet of $SU(3)$ and a complex **27**-dimensional representation of E_6 and half as the conjugate of this. Further subgroups are shown in table 11.4. The first three subgroups correspond to successive breaking of E_6 down to the Standard Model group through smaller grand unified groups; the fourth is an alternate breaking pattern.

It is a familiar fact from grand unification that precisely one $SU(3) \times SU(2) \times U(1)$ generation of quarks and leptons is contained in the **10** plus $\bar{\mathbf{5}}$ of $SU(5)$. Tracing back further, we see that a generation fits into the single representation **16** of $SO(10)$, together with an additional state $\mathbf{1}_{-5}$. This extra state is neutral under $SU(5)$, and so under $SU(3) \times SU(2) \times U(1)$, and can be regarded as a right-handed neutrino. Going back to E_6, the **27** contains the 15 states of a single generation plus 12 additional states. Relative to $SU(5)$ unification, $SO(10)$ and E_6 are more unified in the sense that a generation is contained within a single representation, but less economical in that the representation contains additional unseen states as well. In fact, the latter may not be such a

Table 11.4. *Subgroups and representations of grand unified groups.*

E_6	$\rightarrow$	$SO(10)\times U(1)$
$\mathbf{78}$	$\rightarrow$	$\mathbf{45}_0+\mathbf{16}_{-3}+\overline{\mathbf{16}}_3+\mathbf{1}_0$
$\mathbf{27}$	$\rightarrow$	$\mathbf{1}_4+\mathbf{10}_{-2}+\mathbf{16}_1$
$SO(10)$	$\rightarrow$	$SU(5)\times U(1)$
$\mathbf{45}$	$\rightarrow$	$\mathbf{24}_0+\mathbf{10}_4+\overline{\mathbf{10}}_{-4}+\mathbf{1}_0$
$\mathbf{16}$	$\rightarrow$	$\mathbf{10}_{-1}+\bar{\mathbf{5}}_3+\mathbf{1}_{-5}$
$\mathbf{10}$	$\rightarrow$	$\mathbf{5}_2+\bar{\mathbf{5}}_{-2}$
$SU(5)$	$\rightarrow$	$SU(3)\times SU(2)\times U(1)$
$\mathbf{10}$	$\rightarrow$	$(\mathbf{3},\mathbf{2})_1+(\bar{\mathbf{3}},\mathbf{1})_{-4}+(\mathbf{1},\mathbf{1})_6$
$\bar{\mathbf{5}}$	$\rightarrow$	$(\mathbf{3},\mathbf{1})_2+(\mathbf{1},\mathbf{2})_{-3}$
E_6	$\rightarrow$	$SU(3)\times SU(3)\times SU(3)$
$\mathbf{78}$	$\rightarrow$	$(\mathbf{8},\mathbf{1},\mathbf{1})+(\mathbf{1},\mathbf{8},\mathbf{1})+(\mathbf{1},\mathbf{1},\mathbf{8})+(\mathbf{3},\mathbf{3},\mathbf{3})+(\bar{\mathbf{3}},\bar{\mathbf{3}},\bar{\mathbf{3}})$
$\mathbf{27}$	$\rightarrow$	$(\mathbf{3},\bar{\mathbf{3}},\mathbf{1})+(\mathbf{1},\mathbf{3},\bar{\mathbf{3}})+(\bar{\mathbf{3}},\mathbf{1},\mathbf{3})$

difficulty. To see why, consider the decomposition of the **27** of E_6 under $SU(3)\times SU(2)\times U(1)\subset SU(5)\subset SO(10)\subset E_6$:

$$\begin{aligned}\mathbf{27}\rightarrow\ &(\mathbf{3},\mathbf{2})_1+(\bar{\mathbf{3}},\mathbf{1})_{-4}+(\mathbf{1},\mathbf{1})_6+(\bar{\mathbf{3}},\mathbf{1})_2+(\mathbf{1},\mathbf{2})_{-3}\\ &+[\mathbf{1}_0]\\ &+[(\bar{\mathbf{3}},\mathbf{1})_2+(\mathbf{3},\mathbf{1})_{-2}]+[(\mathbf{1},\mathbf{2})_{-3}+(\mathbf{1},\mathbf{2})_3]+[\mathbf{1}_0]\,.\end{aligned}\qquad(11.4.25)$$

The first line lists one generation, the second the extra state appearing in the **16** of $SO(10)$, and the third the additional states in the **27** of E_6. The subset within each pair of square brackets is a real representation of $SU(3)\times SU(2)\times U(1)$. The significance of this is that for a real representation r, the CPT conjugate also is in the representation r, and so the combined gauge plus $SO(2)$ helicity representation for the particles plus their antiparticles is $(r,+\frac{1}{2})+(r,-\frac{1}{2})$. This is the same as for a *massive* spin-$\frac{1}{2}$ particle in representation r, so it is consistent with the gauge and spacetime symmetries for these particles to be massive. In the most general invariant action, all particles in [ ] brackets will have large (of order the unification scale) masses. It is notable that for any of the $\mathbf{10}+\bar{\mathbf{5}}$ of $SU(5)$, the **16** of $SO(10)$, or the **27** of E_6, the natural $SU(3)\times SU(2)\times U(1)$ spectrum is precisely a standard generation of quarks and leptons.

Also in this paper we have considered the number 16, fundamental in string theory (see above reference) and 0,5 i.e. 1/2, also important in Number Theory. Indeed:

We take n = 16 in the already analyzed formula, and developing, we obtain:

$$-\left(\frac{\exp\left(\pi\sqrt{\frac{16}{6}-\frac{1}{144}}\right)}{2\sqrt{16-\frac{1}{24}}}+\frac{\exp\left(\frac{\pi}{2}\sqrt{\frac{\pi}{6}-\frac{1}{144}}\right)}{\sqrt{16-\frac{1}{24}}}\right)$$

the value -21.79216 (that is the coefficient).

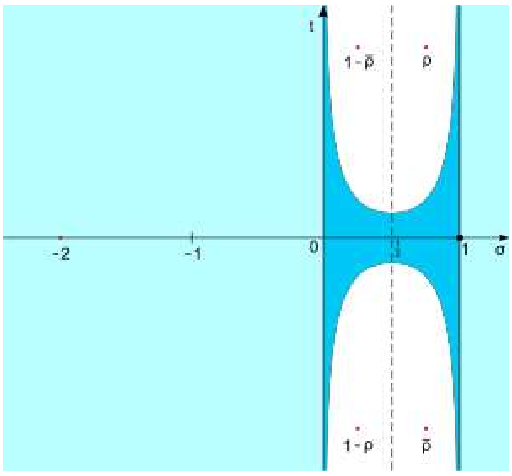
Thence q = coefficient * $-e^{-t}$; for t = 1/2 = 0.5, q = ($-e^{-0.5}$) -21.79216 for each q.

For example: $q^5 = ((-e^{-0.5})* -21.79216)^5$ and so on.

With regard 1/2 = 0.5 we remember that:

"The Riemann hypothesis, asserts that any non-trivial zero *s* has Re(*s*) = 1/2. In the theory of the Riemann zeta function, the set {*s* ∈ ℂ : Re(*s*) = 1/2} is called the **critical line**."

"Apart from the trivial zeros, the Riemann zeta function has no zeros to the right of $\sigma = 1$ and to the left of $\sigma = 0$ (neither can the zeros lie too close to those lines). Furthermore, the non-trivial zeros are symmetric about the real axis and the line $\sigma = 1/2$ and, according to the Riemann hypothesis, they all lie on the line $\sigma = 1/2$."



Now:

The coefficient of q^n in $f(q)$ is

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

It is inconceivable that a single ϑ function could be found to cut out the singularities of $f(q)$.

Mock ϑ-functions

$$\phi(q)=1+\frac{q}{1+q^2}+\frac{q^4}{(1+q^2)(1+q^4)}+\dots$$

$$\psi(q)=\frac{q}{1-q}+\frac{q^4}{(1-q)(1-q^3)}+\frac{q^9}{(1-q)(1-q^3)(1-q^5)}+\dots$$

$$\chi(q)=1+\frac{q}{1-q+q^2}+\frac{q^4}{(1-q+q^2)(1-q^2+q^4)}+\dots$$

These are related to $f(q)$ as shown below.

$$2\phi(-q)-f(q)=f(q)+4\psi(-q)$$

$$=\frac{1-2q+2q^4-2q^9+\dots}{(1+q)(1+q^2)(1+q^3)\dots}$$

$$4\chi(q)-f(q)=\frac{(1-2q^3+2q^{12}-\dots)^2}{(1-q)(1-q^2)(1-q^3)\dots}$$

These are of the 3rd order.

We have that, for t = 2:

ln [[[(((-(1- 2((-e^-2 *(-21.79216))+2((-e^-2 *(-21.79216))^4-2((-e^-2 *(-21.79216))^9)))) / ((((1+((-e^-2 *(-21.79216))))(((1+((-e^-2 *(-21.79216))^2))))((((1+((-e^-2 *(-21.79216))^3))))]]]

Input interpretation:

$$\log\left(-\frac{1-\frac{2(-(-21.79216))}{e^2}+2\left(\left(-\frac{-21.79216}{e^2}\right)^4-2\left(-\frac{-21.79216}{e^2}\right)^9\right)}{\left(1--\frac{21.79216}{e^2}\right)\left(1+\left(-\frac{-21.79216}{e^2}\right)^2\right)\left(1+\left(-\frac{-21.79216}{e^2}\right)^3\right)}\right)$$

Open code

- log(x) is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

4.1897322144805982520201552382784369672471588617266851476 61...

Note that:

Input interpretation:

$$\sqrt[3]{4.189732}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.612113...

This result is very near to the Hausdorff dimension of golden dragon 1,61803

This result 4,1897 is in the range of the mass of hypothetical dark matter particles

For $\phi(q)$ $q = -e^{-t}$, $t = 0.5$ $q^n = -21.79216 * -e^{-0.5}$, we obtain:

$$\phi(q) = 1 + \frac{q}{1+q^2} + \frac{q^4}{(1+q^2)(1+q^4)} + \dots$$

$$\psi(q) = \frac{q}{1-q} + \frac{q^4}{(1-q)(1-q^3)} + \frac{q^9}{(1-q)(1-q^3)(1-q^5)} + \dots$$

$$\chi(q) = 1 + \frac{q}{1-q+q^2} + \frac{q^4}{(1-q+q^2)(1-q^2+q^4)} + \dots$$

φ(q) = 1.075226 + 0.00572374 = 1.08094974 ψ(q) = -1.08185 + 1.08232 – 1.08232 = – 1.08185

χ(q) = 1.081345 + 0.00618954 = 1.08753454

The sum of φ(q) + ψ(q) + χ(q) = 1.08663428 very near to the value 1.08643 already calculated from Ramanujan.

Now:

$$F(q) = 1 + \frac{q^2}{1-q} + \frac{q^8}{(1-q)(1-q^3)} + \dots$$

$$\phi(-q) + \chi(q) = 2F(q).$$

$$f(-q) + 2F(q^2) - 2 = \phi(-q^2) + \psi(-q)$$

$$= \quad 2\phi(-q^2) - f(q) = \frac{1 - 2q + 2q^4 - 2q^9 + \dots}{(1-q)(1-q^4)(1-q^6)(1-q^9)\dots}$$

$$\psi(q) - F(q^2) + 1 = q\frac{1 + q^2 + q^6 + q^{12} + \dots}{(1-q^8)(1-q^{12})(1-q^{28})\dots}$$

((((1- (2(-e^-0.5 *(-21.79216))+((2((-e^-0.5 *(-21.79216))^4))-((2((-e^-0.5 *(-21.79216))^9)))

Input interpretation:

$$\left(1-2\left(-\frac{-21.79216}{e^{0.5}}\right)^1\right)+\left(2\left(-\frac{-21.79216}{e^{0.5}}\right)^4-2\left(-\frac{-21.79216}{e^{0.5}}\right)^9\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$-2.462670232548926677016218944792315099779228851126416\ldots \times 10^{10}$

(-2.4626702325489266770162189447923150997792288511 * 10^10) / ((((((((1-((-e^-0.5 *(-21.79216)^1)))*(1-((-e^-0.5 *(-21.79216))^4)))*(1-(-e^-0.5 *(-21.79216))^6)))*(1-(-e^-0.5 *(-21.79216))^9))))))))

Input interpretation:

$$\frac{-2.4626702325489266770162189447923150997792288511 \times 10^{10}}{\left(\left(\left(1--\frac{(-21.79216)^1}{e^{0.5}}\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^4\right)\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^6\right)\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^9\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$-1.005834389530381683148320482183214342598410387750360... \times 10^{-12}$

1/6.626 ln -(-(-1.0058343895303816831483204821832143425984103877 × 10^-12)))

Input interpretation:

$$\frac{1}{6.626}\log(-(-1.0058343895303816831483204821832143425984103877\times 10^{-12}))$$

Open code

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

Result:

- More digits

$-4.16921...$

Note that:

Input interpretation:

$$\sqrt[3]{4.16921}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.60948...$

This result is very near to the Hausdorff dimension of golden dragon 1,61803

This result -4,16921 is in the range of the mass of hypothetical dark matter particles with minus sign

Now:

$$-\frac{-21.79216\left(\left(\left(1+\left(-\frac{-21.79216}{e^{0.5}}\right)^2\right)+\left(-\frac{-21.79216}{e^{0.5}}\right)^6\right)+\left(-\frac{-21.79216}{e^{0.5}}\right)^{12}\right)}{e^{0.5}}$$

$3.7582838213624412933987326486202281989113112090736723... \times 10^{14}$

$$\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^8\right)\left(\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^{12}\right)\left(1-\left(-\frac{-21.79216}{e^{0.5}}\right)^{28}\right)\right)$$

- Fewer digits

- More digits
  $-6.536508342258849896114505619942924476936123331637070\ldots \times 10^{53}$

((-e^-0.5 *(-21.79216)) ((((1+ ((-e^-0.5 *(-21.79216))^2))+((-e^-0.5 *(-21.79216))^6))+((-e^-0.5 *(-21.79216))^12)))) / (-6.53651*10^53)

Input interpretation:

$$-\frac{-\frac{-21.79216\left(\left(\left(1+\left(-\frac{-21.79216}{e^{0.5}}\right)^2\right)+\left(-\frac{-21.79216}{e^{0.5}}\right)^6\right)+\left(-\frac{-21.79216}{e^{0.5}}\right)^{12}\right)}{e^{0.5}}}{6.53651\times 10^{53}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $-5.74968\ldots \times 10^{-40}$

Result: -5,74968 * 10^{-40}

1/21.676 ln -(-5.74968 * 10^-40)

Input interpretation:

$$\frac{1}{21.676}\log\left(-\left(-\frac{5.74968}{10^{40}}\right)\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $-4.16840\ldots$

This result -4,16840 is in the range of the mass of hypothetical dark matter particles with minus sign

Now, we have:

Mock ϑ-functions (of 7th order)

$$\text{(i)} \quad 1+\frac{q}{1-q^2}+\frac{q^4}{(1-q^3)(1-q^4)}+\frac{q^9}{(1-q^4)(1-q^5)(1-q^6)}+\ldots$$

$$\text{(ii)} \quad \frac{q}{1-q}+\frac{q^4}{(1-q^2)(1-q^3)}+\frac{q^9}{(1-q^3)(1-q^4)(1-q^5)}+\ldots$$

$$\text{(iii)} \quad \frac{1}{1-q}+\frac{q^2}{(1-q^2)(1-q^3)}+\frac{q^6}{(1-q^3)(1-q^4)(1-q^5)}+\ldots$$

From the (i), we have:

0.9239078+0.000433255+(-1.875414025424324640438329947635480504384716377 6 × 10^-7)

Input interpretation:

$0.9239078+0.000433255-1.8754140254243246404383299476354805043847163776\times10^{-7}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

0.92434086745859745756753595616700523645194956152836224

Open code

The result is

0.92434086745859745756753595616700523645194956152836224

1.6449 ((exp (0.92434086745859745756753595616700523645194956152836224)))

Input interpretation:

$1.6449\exp(0.92434086745859745756753595616700523645194956152836224)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.14549...

Note that:

Input interpretation:

$\sqrt[3]{4.14549}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.60642...

This result is very near to the Hausdorff dimension of golden dragon 1,61803

This result 4,14549 is in the range of the mass of hypothetical dark matter particles

From the (ii), we have:

-1.081849047367565973116419938674252971482398018961922 +

0.0761251367814440464022202749466671971676215118725857

-0.000433255719961759072744149660169833646052283127278

Input interpretation:

$-1.081849047367565973116419938674252971482398018961922 + 0.0761251367814440464022202749466671971676215118725857 - 0.000433255719961759072744149660169833646052283127278$

Open code

Result:

$-1.0061571663060836857869438133877556079608287902166143$

The result is -1.0061571663…

-1.0061571663060836857869438133877556079608287902166143

1/(142*(((sqrt(5)+1)/2))^2))) * (8Pi) * 10^4 ln -(-1.00615716630608368578694381338775560796082879021661439)

Input interpretation:

$$\frac{1}{142\left(\frac{1}{2}\left(\sqrt{5}+1\right)\right)^2}(8\pi)\times 10^4 \log(-(-1.00615716630608368578694381338775560796082879021661439))$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.149765203276484724071530319835938309107282758224328...

This result 4,14976 is in the range of the mass of hypothetical dark matter particles

From the (iii), we have:

-0.08184904736756597311641993867425297148239801896192

0.00043573456306404571407578530708342810497056169724 66

-1.8762261787851325482986508127679968797519452065 × 10^-7

$$-0.081849047367565973116419938674252971482398018961922 + 0.00043573456306404571407578530708342810497056169724 66 - 1.8762261787851325482986508127679968797519452065 \times 10^{-7}$$

$$-0.081413500427119805915598983232250820177115432459196 05$$

The result is:

-0.08141350042711980591559898323225082017711543245919605

((sqrt(5))+1))/2) - ln-(-0.081849047367565973116419938674252971482398018961922+ 0.000435734563064045714075785307083428104970561697246 6 - 1.8762261787851325482986508127679968797519452065 × 10^-7)

Input interpretation:

$$\frac{1}{2}\left(\sqrt{5}+1\right) - \log(-(-0.081849047367565973116419938674252971482398018961922 + 0.00043573456306404571407578530708342810497056169724 66 - 1.8762261787851325482986508127679968797519452065 \times 10^{-7}))$$

Open code

- log(x) is the natural logarithm

Result:

- More digits

4.126248155562591409642743693895542886823339736807 47...

Note that:

Input interpretation:

$$\sqrt[3]{4.12624}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.60393...

This result is the mean of two Hausdorff dimensions: 1,61803 and 1,5849

This result 4,12624 is in the range of the mass of hypothetical dark matter particles

We have (pag.4 paper):

Mock ϑ-functions (of 5th order)

$$f(q) = 1 + \frac{q^2}{1+q} + \frac{q^6}{(1+q)(1+q^2)} + \frac{q^12}{(1+q)(1+q^2)(1+q^3)} + \dots$$
$$\phi(q) = q + q^4(1+q) + q^9(1+q)(1+q^3) + \dots$$
$$\psi(q) = 1 + q(1+q) + q^3(1+q)(1+q^2) + q^6(1+q)(1+q^2)(1+q^3) + \dots$$

We have also (pag. 5 paper):

$$\chi(q) = \frac{1}{1-q} + \frac{q}{(1-q^2)(1-q^3)} + \frac{q^2}{(1-q^3)(1-q^4)(1-q^5)} + \frac{q^3}{(1-q^4)(1-q^5)(1-q^6)(1-q^7)} + \dots$$
$$F(q) = \frac{1}{1-q} + \frac{q^4}{(1-q)(1-q^3)} + \frac{q^{12}}{(1-q)(1-q^3)(1-q^5)} + \dots$$

The product of the five results is:

(-4.9290621621 * 10^6)*(4.04437 * 10^14)*(3.0773505768788923 * 10^13)*(-0.081816033806147139999500992)*(-2498.279529)

Input interpretation:

$(-4.9290621621\times10^{6})(4.04437\times10^{14})(3.0773505768788923\times10^{13})\times(-0.081816033806147139999500992)\times(-2498.279529)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1.2539251174384734581002648529712833588881437230635 49\ldots\times10^{37}$

sqrt(37)/196884 * (((((169/(sqrt(48)) ln (((((-0.72999480077443047538362776991420567540346048553554829328)/(-1.2539251174384734581002648529712833588881437230635 49 × 10^37))))))^16

Input interpretation:

$$\frac{\sqrt{37}}{196\,884}\left(\frac{169}{\sqrt{48}}\log\left((-0.72999480077443047538362776991420567540346048553554829328)/(-1.25392511743847345810026485297128335888814372306354\times 10^{37})\right)\right)^{16}$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.138200933057162930798006081470941343371817909713488 7\ldots \times 10^{48}$

This result 4,1382 is a multiple of the mass of hypothetical dark matter particles

we have also that:

1/34 zeta(2) gamma (2) * ln (((((-0.72999480077443047538362776991420567540346048553554829328)*(-1.25392511743847345810026485297128335888814372306354 9 × 10^37)))))))

Input interpretation:

$$\frac{1}{34}\zeta(2)\left(\Gamma(2)\log\left(-0.72999480077443047538362776991420567540346048553554829328\left(-1.25392511743847345810026485297128335888814372306354 9\times 10^{37}\right)\right)\right)$$

Open code

- $\zeta(s)$ is the Riemann zeta function
- $\Gamma(x)$ is the gamma function
- $\log(x)$ is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.117521997369438342927966978268890909081822079845495 07...

Note that:

Input interpretation:

$\sqrt[3]{4.11752}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.60280...

This result is the mean of two Hausdorff dimensions: 1,61803 and 1,5849

This result 4,11752 is in the range of the mass of hypothetical dark matter particles

Note that the value 0.7299948007744.... is given by:

From:

$$f(q) = 1 + \frac{q}{(1+q)^2} + \frac{q^4}{(1+q)^2(1+q^2)^2} + \dots$$

We obtain, for q = -e^{-t} for t = 0.5; q = -0,606530

1+[((-0.606530)/(1-0.606530)^2))]+(((-0.606530)^4)))/[(((1-0.606530)^2))*((1-0.606530^2)^2)))]

Input interpretation:

$$1 - \frac{0.606530}{(1-0.606530)^2} + \frac{(-0.606530)^4}{(1-0.606530)^2\,(1-0.606530^2)^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

-0.72999480077443047538362776991420567540346048553554829328...

Open code

Now we multiply and add algebraically various solutions of the 21 Mock theta functions of the Ramanujan's paper. We'll have:

[(1.63161*10^20)(9.39267*10^17)(6.5960861587*10^20)(4.04437000433962*10^14)(3.0773505768788923*10^13)(0.923910279+0.924340867458)]/(0.081816+0.07609+0.0814135+1.006157+1.08185+1.08753+1.0809+4.85773)

Input interpretation:

$$(1.63161\times 10^{20}\times 9.39267\times 10^{17}\times 6.5960861587\times 10^{20}\times 4.04437000433962\times 10^{14}\times 3.0773505768788923\times 10^{13}\,(0.923910279+0.924340867458))/(0.081816+0.07609+0.0814135+1.006157+1.08185+1.08753+1.0809+4.85773)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.4860339674506047571235568994210729337306033506999466\ldots\times 10^{86}$

Open code

The result is $2.48603396745 * 10^{86}$

[(1.63161*10^20)(9.392*10^17)(6.59608*10^20)(4.04437*10^14)(3.07735*10^13)(4.929*10^6)(33021.10)(2498.27)(2122.18)/(0.081816+0.07609+0.0814135+1.006157+1.08185+1.08753+1.0809+4.85773)^2]

Input interpretation:

$$1.63161 \times 10^{20} \times 9.392 \times 10^{17} \times 6.59608 \times 10^{20} \times 4.04437 \times 10^{14} \times 3.07735 \times 10^{13} \times 4.929 \times 10^{6} \times 33021.10 \times 2498.27 \times 2122.18 / (0.081816 + 0.07609 + 0.0814135 + 1.006157 + 1.08185 + 1.08753 + 1.0809 + 4.85773)^2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$$1.2408321207041088963380961774320869895869655907042159\ldots \times 10^{103}$$

Open code

This important and beautifully result is very near to the entropy of SMBHs (supermassive Black Hole) ≈ 1.2 * 10^{103}

We note that:

Input interpretation:

$$2 \times 1.61803398 \left(1.63161 \times 10^{20} \times 9.392 \times 10^{17} \times 6.59608 \times 10^{20} \times 4.04437 \times 10^{14} \times 3.07735 \times 10^{13} \times 4.929 \times 10^{6} \times 33021.10 \times 2498.27 \times 2122.18 / (0.081816 + 0.07609 + 0.0814135 + 1.006157 + 1.08185 + 1.08753 + 1.0809 + 4.85773)^2\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$$4.0154170695494194397906743671864517829352329817003871\ldots \times 10^{103}$$

where 4,0154 * 10^{103} can be another multiple of the mass of hypothetical dark matter particles

((2.4860339674506047571235568994210729337306033506999466 × 10^86)*(sqrt(2Pi))

Input interpretation:

$$2.4860339674506047571235568994210729337306033506999466 \times 10^{86} \sqrt{2\pi}$$

Open code

Result:

- More digits

$$6.2315630345047702650888005180122216175976846206065610\ldots \times 10^{86}$$

This result is very near to the entropy of Dark Matter ≈6 * 10^{86}

Multiplying all 21 values obtained, we have the following final expressions:

((-1.0058343895*10^-12)*(-5.74968*10^-40)*(1.08663428)*(-0.081816)*(-0.07609064)*(0.92391)*(-0.0814135)*(-1.00615716)*(0.9243408)))

Input interpretation:

$-1.0058343895 \times 10^{-12} \left(-5.74968 \times 10^{-40}\right) \times 1.08663428 \times (-0.081816) \times (-0.07609064) \times 0.92391 \times (-0.0814135) \times (-1.00615716) \times 0.9243408$

Open code

Result:

- More digits
  $2.7368252918327916655091995391494943566521964877723009... \times 10^{-55}$

Open code

(((2.7368252918327916655091 9 × 10^-55)*(-4.92906*10^6)*(4.04437*10^14)*(3.07735*10^13)*(-2498.279)*(33021.10)*(-2122.186)*(1.63161*10^20)*(9.39267*10^17)*(-4267.24)*(6.596086*10^20)))

Input interpretation:

$2.7368252918327916655091 9 \times 10^{-55} \left(-4.92906 \times 10^{6}\right) \times 4.04437 \times 10^{14} \times 3.07735 \times 10^{13} \times (-2498.279) \times 33\,021.10 \times (-2122.186) \times 1.63161 \times 10^{20} \times 9.39267 \times 10^{17} \times (-4267.24) \times 6.596086 \times 10^{20}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $1.2679253155135415624160519807126734461448377868813883... \times 10^{54}$

The final result is 1,26792531 * 10^{54}

Note that:

Input interpretation:

$2 \times 1.61803398 \times 1.2679253155135415624160519807126734461448377868813883 \times 10^{54}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $4.1030924892062627962629260044788205050120950815241689... \times 10^{54}$

The result 4.103092 * 10^{54} can be considered another multiple of the mass of hypothetical dark matter particles

The square of the result is:

((1.2679253155135415624160519807126734461448377868813888 × 10^54))^2

Enlarge Data Customize A Plaintext Interactive
Result:
$1.60763460572011391984765467373170061966051761322419 8 \times 10^{108}$

Note that:

Input interpretation:
$2.61803398 \left(1.607634605720113919847654673731700619660517613224198 \times 10^{108}\right)$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
4.20884×10^{108}

Note that:

Input interpretation:
$\sqrt[3]{4.20884 \times 10^{108}}$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

$1.61456... \times 10^{36}$

This result is about a multiple of Hausdorff dimension of golden dragon 1,61803

The result 4.20884 * 10^{108} can be considered another multiple of the mass of hypothetical dark matter particles

Now:

(1.607634605720113919847654673731700619660517613224198×10^108)/(6.59608 *10^20*1.086634^28)*2.61803398)

Input interpretation:
$$\frac{1.607634605720113919847654673731700619660517613224198 \times 10^{108}}{6.59608 \times 10^{20} \times 1.086634^{28}} \times 2.61803398$$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits

$6.23081131728379213440374114546257691327137562648225 20\ldots \times 10^{86}$

This result is very near to the entropy of Dark Matter $\approx 6 * 10^{86}$

Phenomenological consequences of superfluid dark matter with baryon-phonon coupling

Lasha Berezhiani -Max-Planck-Institut fur Physik, Fohringer Ring 6, 80805 Munchen, Germany *Benoit Famaey* - Universite de Strasbourg, CNRS UMR 7550, Observatoire astronomique de Strasbourg, 11 rue de l'Universite, F-67000 Strasbourg, France - *Justin Khoury* - Center for Particle Cosmology, Department of Physics and Astronomy, University of Pennsylvania, Philadelphia PA 19104, USA (Dated: November 17, 2017)

Using (22) this translates to an upper bound on the mass of the DM particle:

$$m \lesssim 4.2 \left(\frac{\sigma/m}{\text{cm}^2/\text{g}} \right)^{1/4} \text{eV}. \qquad (24)$$

Smaller and less massive galaxies result in a somewhat weaker bound.

The bound (24) on the DM particle mass is the main result of this Section. It shows that for values of σ/m satisfying the merging-cluster bound $\sim 1\,\text{cm}^2/\text{g}$ [85–88], m must be somewhat below 4 eV. The dependence on the cross section is rather weak, however, scaling as the 1/4 power. It should be mentioned that the upper bound (24) would be somewhat tighter had we assumed a $\rho \propto r^{-2}$ transition density profile outside the superfluid core, instead of $\rho \propto r^{-3}$.

Note that, from the size of Monster group:

(((8.1 * 10^53))^2))^1/7

Input:

$$\sqrt[7]{(8.1 \times 10^{53})^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits

$2.525947\ldots \times 10^{15}$

This result is a multiple very near to the Hausdorff dimension 2,529

From the following Mock Theta functions:

Mock ϑ-functions (of 5th order)

$$
\begin{aligned}
f(q) &= 1+\frac{q}{1+q^2}+\frac{q^4}{(1+q)(1+q^2)}+\frac{q^9}{(1+q)(1+q^2)(1+q^3)}+\dots \\
\phi(q) &= 1+q(1+q)+q^4(1+q)(1+q^3)+q^9(1+q)(1+q^3)(1+q^5)+\dots \\
\psi(q) &= q+q^3(1+q)+q^6(1+q)(1+q^2)+q^{10}(1+q)(1+q^2)(1+q^3)+\dots \\
\chi(q) &= 1+\frac{q}{1-q^2}+\frac{q^2}{(1-q^3)(1-q^4)}+\frac{q^3}{(1-q^4)(1-q^5)(1-q^6)}+\dots \\
&= 1+\left\{\frac{q}{1-q}+\frac{q^3}{(1-q^2)(1-q^3)}+\frac{q^5}{(1-q^3)(1-q^4)(1-q^5)}+\dots\right\}
\end{aligned}
$$

$$F(q)=1+\frac{q^2}{1-q}+\frac{q^8}{(1-q)(1-q^3)}+\dots$$

we have obtained that

ψ(q) = (32844.3)+(1.33208 × 10^10)+(9.39267 × 10^17) =

= 9.392670133208328443 × 10^17

Note that:

(((9.392670133208328443 * 10^17))^1/8

Input interpretation:

$\sqrt[8]{9.392670133208328443 \times 10^{17}}$

Open code

176.44064380948958081

Input interpretation:

$1.7644064380948958081 \times 10^2$

Open code

This result is a multiple very near to the Hausdorff dimension 1,7712

From:

Magnetic Monopoles and Dark Matter

V. V. Burdyuzha
Astrospace Center, Lebedev Physical Institute, Russian Academy of Sciences, Profsoyuznaya ul. 84/32, Moscow, 117997 Russia
e-mail: burdyuzh@asc.rssi.ru
Received October 8, 2017; in final form, May 29, 2018

Dirac's theory does not predict the magnetic monopole mass, but it is often assumed that the monopole mass can be

$$m_g = (g/e)^2 m_e = 4692.25 m_e \approx 2.56 m_p \approx 2.4\ \mathrm{GeV}/c^2. \quad (6)$$

from our electric world. The minimum mass of the magnetic charge in Schwinger's symmetric world must probably be

$$m_g = (g/e)^2 m_e = 18769 m_e \approx 10.24 m_p \approx 9.6\ \mathrm{GeV}/c^2. \quad (10)$$

Here, as in Dirac's case, the classical magnetic monopole radius is equal to the classical electron radius. Before the annihilation of Schwinger magnetic charges with a minimum mass of 9.6 GeV/c^2, they could also form an atomic system—monopolium (g^+g^-). In this

theory [62]. As has been mentioned, the relation between the masses m_g and m_e in the case where the classical radii r_g and r_e are equal is $m_g = m_e(g^2/e^2)$ and then $m_g = 2.4$ GeV/c^2. However, nature could choose a different definition of the masses. As was shown by Caruso [61], the relation between the charges in the Born–Infeld electromagnetic theory is different, $m_g = m_e(g^2/e^2)^{3/4}$, and then $m_g = 0.29$ GeV/c^2. This point

In the above work we have three fundamental values:

$m_g = 2.4$ GeV/c^2 = 2.16 * 10^{17} GeV; $m_g = 9.6$ GeV/c^2 = 8.64 * 10^{17} GeV;

$m_g = 0.29\ GeV/c^2 = 2.61 * 10^{16}$ GeV.

We observe that utilizing the following 5th order Ramanujan's Mock Theta function

$\psi(q) = 9.392670133208328443 \times 10^{17}$, we can to obtain some new interesting mathematical connections.

-0.07609064*10^17 - [(((9.392670133208328443 * 10^17)*(-0.081816-0.0814135-0.07609064)))]

Input interpretation:

$$-0.07609064 \times 10^{17} - (9.392670133208328443 \times 10^{17})(-0.081816 - 0.0814135 - 0.07609064)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$$2.17176449125323581214474202 \times 10^{17}$$

This result is very near to the value $2.16 * 10^{17}$ GeV

[(((9.392670133208328443 * 10^17)/(1.08663428))]

Input interpretation:

$$\frac{9.392670133208328443 \times 10^{17}}{1.08663428}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$$8.6438190899042209886844357606682535360471050112646915... \times 10^{17}$$

Open code

This result is practically equal to the value $8.64 * 10^{17}$ GeV.

[(((9.392670133208328443 * 10^17)*0.081816*1/(1.006157+0.92434+0.92391+0.0814135))]

Input interpretation:

$(9.392670133208328443 \times 10^{17}) \times$

$0.081816 \times \frac{1}{1.006157 + 0.92434 + 0.92391 + 0.0814135}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$2.6175670468224218745406539670936966343821088516821787... \times 10^{16}$

This result is practically equal to the value 2.61 * 10^{16} GeV.

Now, from:

On Symmetric and Asymmetric Light Dark Matter

Tongyan Lin, Hai-Bo Yu and Kathryn M. Zurek
Physics Department, Harvard University, Cambridge, MA 02138, USA
Michigan Center for Theoretical Physics, Department of Physics,
University of Michigan, Ann Arbor, MI 48109

(Dated: October 30, 2018)

We first consider nucleon scattering in the mass range 1 GeV $\lesssim m_X \lesssim$ 10 GeV, taking universal couplings to the light quarks given by g_q. The DM-nucleon scattering cross section is given by

$$\sigma_n = 4\alpha_X g_n^2 \frac{\mu_n^2}{m_\phi^4}, \tag{33}$$

$$\sigma_n \gtrsim 10^{-48}\text{cm}^2 \times \left(\frac{m_X}{\text{GeV}}\right)^4 \left(\frac{\text{GeV}}{m_\phi}\right)^6 \left(\frac{\mu_n}{0.5\text{GeV}}\right)^2. \tag{34}$$

the lower bound on σ_n is given by

$$\sigma_n \gtrsim 5 \times 10^{-54}\text{cm}^2 \times \left(\frac{m_X}{\text{GeV}}\right) \left(\frac{\text{GeV}}{m_\phi}\right)^5 \left(\frac{\mu_n}{0.5\text{GeV}}\right)^2 \tag{35}$$

We have, from some results of Ramanujan's Mock theta functions:

((-1.0058343895*10^-12)*(-5.74968*10^-40)*(1.08663428)*(-0.081816)*(-0.07609064)*(0.92391)*(-0.0814135)*(-1.00615716)*(0.9243408)))*19

Input interpretation:

$(-1.0058343895 \times 10^{-12} (-5.74968 \times 10^{-40}) \times 1.08663428 \times (-0.081816) \times (-0.07609064) \times 0.92391 \times (-0.0814135) \times (-1.00615716) \times 0.9243408) \times 19$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$5.1999680544823041644674791243840392776391733267673718... \times 10^{-54}$

This result is practically equal to the value ≥ 5 * 10^{-54} that is lower bound of DM-nucleon scattering cross section σ_n

Note that:

3sqrt(2) * 1/(5.1999680544823041644674791243840392776391733267673718 × 10^-54)

Input interpretation:

$$3\sqrt{2} \times \frac{1}{5.1999680544823041644674791243840392776391733267673718 \times 10^{-54}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$8.1589745218957347222111009973834815197667873330176127... \times 10^{53}$

Comparisons:

≈ the size of the Monster group (≈ 8.1×10^{53})

And

ln ((1/(5.1999680544823041644674791243840392776391733267673718 × 10^-54))

Input interpretation:

$$\log\left(\frac{1}{5.1999680544823041644674791243840392776391733267673718 \times 10^{-54}}\right)$$

Open code

- log(x) is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

122.6909425394787434940974533882926272781356067185305911...

This result 122.6909 is in the range of the mass of Higgs boson

122 ±7; 125.18±0.16 OUR AVERAGE

Now:

((1/((5.19996805448230416446747912438403927763917332676737 18 × 10^-54))))^2 * (11/33021.10)

Input interpretation:

$$\left(\frac{1}{5.1999680544823041644674791243840392776391733267673718\times 10^{-54}}\right)^2\times\frac{11}{33021.10}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  1.2319690503250296576934886341704914525495980981043204... × 10^{103}

This result is practically equal to the value of entropy of SMBHs ≈1.2 * 10^{103} within Cosmic Event Horizon.

Note that:

[(((((((((1/((5.1999680544823041644674791243840392776391733267673718 × 10^-54))))^2 * (11/33021.10))))))]^1/3

Input interpretation:

$$\left((1/(5.1999680544823041644674791243840392776391733267673718\times 10^{-54}))^2\times\frac{11}{33021.10}\right)\hat{}\,(1/3)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  2.309581... × 10^{34}

This result is a multiple very near to the Hausdorff dimension 2,3219

This mathematical connection leaves open the possibility that SMBHs can somehow be connected to dark matter through the emission of Hawking radiation. It is as if the radiation was emitted by a black body whose temperature is inversely proportional to the mass of the black hole.The quantum fluctuations of the vacuum cause the appearance of particle-antiparticle pairs near the event horizon of the celestial object. One particle of the pair falls into the black hole, while the other escapes into the outer universe. The particle-antiparticle pair could, in this case, be constituted by particle-antiparticle of dark matter.

((1/((5.1999680544823041644674791243840392776391733267673718×10^-54))))^2 * 1/(1.63161*10^20)

Input interpretation:

$$\left(\frac{1}{5.1999680544823041644674791243840392776391733267673718\times 10^{-54}}\right)^2\times \frac{1}{1.63161\times 10^{20}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $2.2666386523789295029651391479919842310682272979289600\ldots\times 10^{86}$

This result is practically equal to the value of entropy of Relic Gravitons ≈2.3 * 10^{86} within Cosmic Event Horizon.

Now:

((((1/((5.1999680544823041644674791243840392776391733267673718 × 10^-54)))^2 * 89/(1.63161*10^20)

Input interpretation:

$$\left(\frac{1}{5.1999680544823041644674791243840392776391733267673718\times 10^{-54}}\right)^2\times \frac{89}{1.63161\times 10^{20}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $2.0173084006172472576389738417128659656507222951567744\ldots\times 10^{88}$

Open code

This result 2,0173 * 10^{88} is in the range of Photons and Relic Neutrinos within Cosmic Event Horizon

Note that 2,0173 is a multiple practically equal to the Hausdorff dimension 2,01

Note also that:

((((1/((5.1999680544823041644674791243840392776391733267673718 × 10^-54))))^1/((16^2-2+sqrt(0.92391))

Input interpretation:

$$\left(\frac{1}{5.1999680544823041644674791243840392776391733267673718\times 10^{-54}}\right)^{\wedge}\left(\frac{1}{16^2-2+\sqrt{0.92391}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  1.61803778...

The result 1,61803778... is practically equal to the golden ratio Φ and to the Hausdorff dimension of the golden dragon 1,61803

and:

((((1/((5.1999680544823041644674791243840392776391733267673718 × 10^-54))))^1/(((108-(0.081816+0.0814135)*5)))

Input interpretation:

$$\left(\frac{1}{5.1999680544823041644674791243840392776391733267673718\times 10^{-54}}\right)^{\wedge}\left(\frac{1}{108-(0.081816+0.0814135)\times 5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  3.1414280...

The result 3,1414280... is a very near to the value of π

The importance also at the physical and cosmological level of the two values of Pigreco and Phi, appears increasingly evident. These can be considered fundamental and universal constants in both mathematics and physics.

From:

The VAK of vacuum fluctuation, Spontaneous self-organization and complexity theory interpretation of high energy particle physics and the mass spectrum
M.S. El Naschie

Chaos, Solitons and Fractals 18 (2003) 401–420

The essential four dimensionality of the embedding topological dimension which contains the Hausdorff dimension $4+\phi^3$ is easily reasoned as follows. We know that lifting a Hausdorff dimension $d_c^{(0)}$ to any desirable dimension $d_c^{(n)}$ is achieved by following the bijection formula [9]:

$$d_c^{(n)} = (1/d_c^{(0)})^{n-1}$$

Thus $d_c^{(4)}$ is found using $d_c^{(0)} = \phi$ to be

$$d_c^{(4)} = (1/\phi)^{4-1} = (1+\phi)^3 = 4+\phi^3$$

In other words in our so-called E-infinity "prespace" we have

$$d_c^{(4)} =\sim \langle n \rangle = \langle d_c \rangle = 4+\phi^3 = 4.236067977$$

while the topological dimension is exactly equal to $n_t = 4$. Thus the superscript (4) refers to the number of the topological dimension which can embed the fractal set with the Hausdorff dimension $d_c^{(4)}$.

Our physical interpretation of this situation is that in our classical low energy world of the macroobjects, the Hausdorff dimension and the topological dimension coincide and appear to be exactly 4. It is only when we probe the space at higher resolution coming near to the quantum level that we start to feel the effect of the Hausdorff dimension expectation value of $4+\phi^3$. One could elucidate this result in slightly different manner and in analogy to Feynmann summing over all paths approach by noting that

$$\begin{aligned}\sum_{0}^{n_t=\infty} n\phi^n &= (1)(\phi)^1 + (2)(\phi)^2 + (3)(\phi^3) + \cdots \\ &= 4+\phi^3 \\ &= \langle d_c \rangle\end{aligned}$$

Now this implies that a statistical property for our space which is almost identical to that of a black body radiation is present and that $4+\phi^3$ may be approximated by the expectation of a gamma distribution of the infinitely many hierarchical dimensions. Thus we may write approximately that (see Fig. 6)

$$\langle d_c \rangle =\sim \langle n \rangle \simeq 2/\ln(1/\phi) = 4.156173841$$

To account for the spin 1/2 of the Fermi–Dirac statistics one must write

$$\langle d_c \rangle_f = \langle d_c \rangle + 1 = 5.156173841$$

Lifting the dimension bijectively to $4D$ one finds

$$\begin{aligned}D_\alpha &= [\langle d_c \rangle + 1]^{4-1} \\ &\cong (5.156173841)^3 \cong 137.082\end{aligned}$$

From our construction of the E-infinity space, we can easily reason that we are dealing indeed with a kind of a statistical geometry and topology on a random manifold. That means $\varepsilon^{(\infty)}$ is a probabilistic space. This is a direct consequence of two facts. First, the Hausdorff dimension of a random cantor set, following Mauldin–Williams theorem

Similarly, the expectation value for the dimension corresponding to that of the exceptional Lee group $E_8 \otimes E_8$ is given simply by [1,2,8].

$$\text{"Dim}\, E_8 \otimes E_8 \Rightarrow (\bar{\alpha}_0)(3+\phi) = 495.96744 \simeq 496$$

Here ϕ = 0.61803398;

$$\langle d_c \rangle =\sim \langle n \rangle \simeq 2/\ln(1/\phi) = 4.156173841$$

$$\langle d_c \rangle_f = \langle d_c \rangle + 1 = 5.156173841$$

$$D_\alpha = [\langle d_c \rangle + 1]^{4-1}$$
$$\cong (5.156173841)^3 \cong 137.082$$

$$\mathrm{Dim}\, E_8 \otimes E_8 \Rightarrow (\bar{\alpha}_0)(3+\phi) = 495.96744 \simeq 496$$

Now we take all the value of the mass of hypothetical dark matter particles and calculate the average:

Input interpretation:

$$\left(\frac{1}{10}(4.1897 + 4.16921 + 4.16840 + 4.14549 + 4.14976 + 4.12624 + 4.11752 + 4.0154 + 4.103092 + 4.20884) + 1\right)^3 (-(-3 + 1 - 1.65578))$$

Open code

Or:

$$\left(\frac{1}{10}(4.1897 + 4.16921 + 4.16840 + 4.14549 + 4.14976 + 4.12624 + 4.11752 + 4.0154 + 4.103092 + 4.20884) + 1\right)^3 (3 + 0.65578)$$

Enlarge Data Customize A Plaintext Interactive

Result:

496.25910845899324826682961024

The result is a good approximation to the dimension corresponding to that of the exceptional Lie Group E8xE8 = 496. The E_8 Lie group has applications in theoretical physics and especially in string theory and supergravity. $E_8 \times E_8$ is the gauge group of one of the two types of heterotic string.

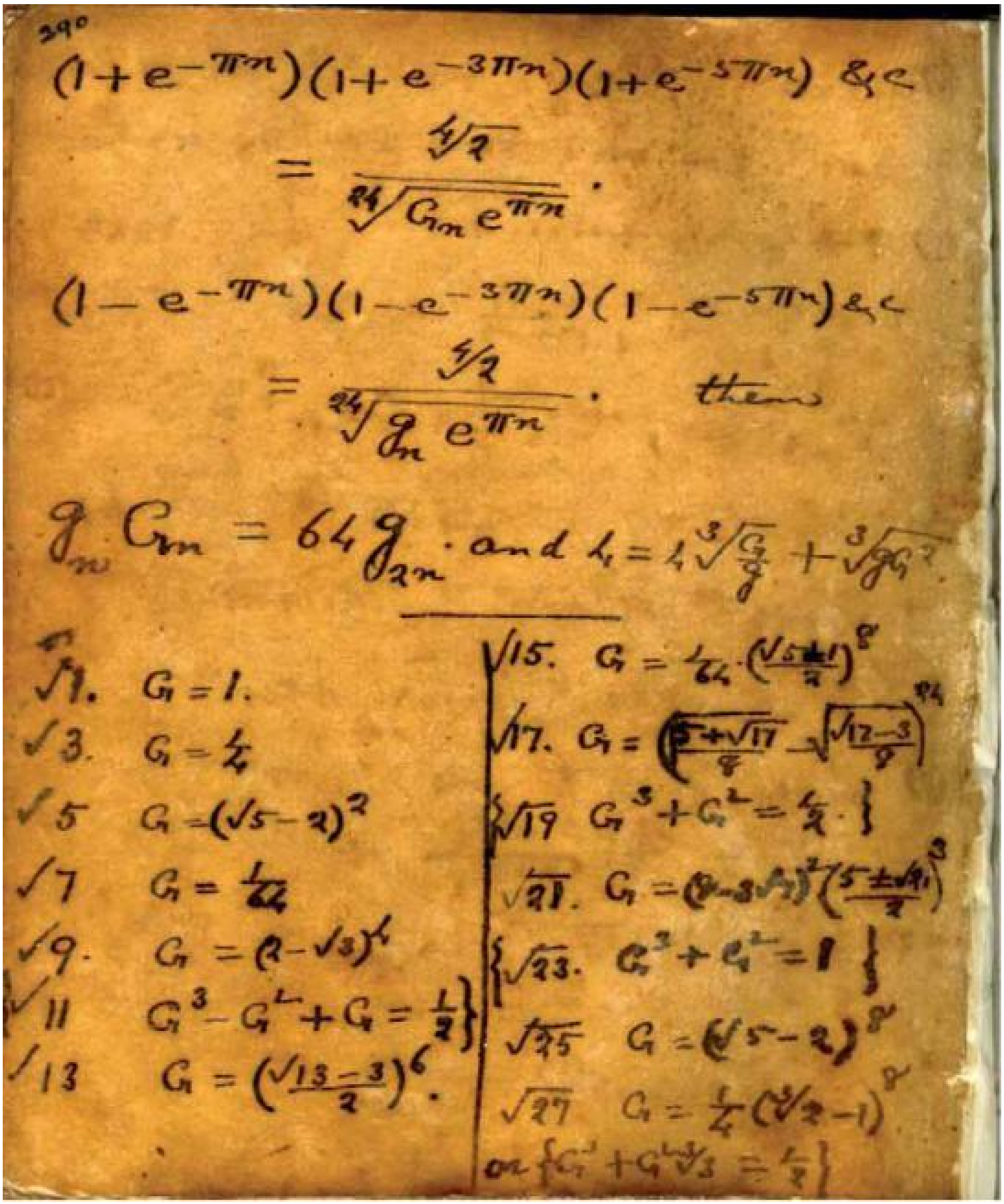
Here $\phi = 0.65578$ that is given by 1 – 1.65578, where 1.65578 is the fourteenth root of the following Ramanujan's class invariant:

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

Note that the our result, obtained with the Ramanujan's mathematics, is even more precise!

From:

https://pparihar.com/2016/10/23/lost-notebook-of-ramanujan-math/


290

$(1+e^{-\pi n})(1+e^{-3\pi n})(1+e^{-5\pi n})$ &c

$$= \frac{\sqrt[4]{2}}{\sqrt[24]{G_n e^{\pi n}}}.$$

$(1-e^{-\pi n})(1-e^{-3\pi n})(1-e^{-5\pi n})$ &c

$$= \frac{\sqrt[4]{2}}{\sqrt[24]{g_n e^{\pi n}}}.$$ then

$g_n G_n = 64 g_{2n}$ and $4 = 4\sqrt[3]{\frac{G}{g}} + \sqrt[3]{gG^2}$.

√1. $G = 1.$

√3. $G = \frac{1}{4}$

√5 $G = (\sqrt{5}-2)^2$

√7 $G = \frac{1}{64}$

√9. $G = (2-\sqrt{3})^4$

√11 $G^3 - G^2 + G = \frac{1}{2}$

√13 $G = \left(\frac{\sqrt{13}-3}{2}\right)^6.$

√15. $G = \frac{1}{64}\left(\frac{\sqrt{5}\pm 1}{2}\right)^8$

√17. $G = \left(\sqrt{\frac{5+\sqrt{17}}{8}} - \sqrt{\frac{\sqrt{17}-3}{8}}\right)^{24}$

√19 $G^3 + G^2 = \frac{1}{2}.$

√21. $G = (8-3\sqrt{7})^2\left(\frac{5\pm\sqrt{21}}{2}\right)^3$

√23. $G^3 + G^2 = 1$

√25 $G = (\sqrt{5}-2)^8$

√27 $G = \frac{1}{4}(\sqrt[3]{2}-1)^8$

or $\{G^3 + G^{2}\sqrt[3]{3} = \frac{1}{2}\}$

For n = 1/2 and $G_n = 1/64$

(((2)^1/4))/((e^(Pi/2)/64))^1/24

Input:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\sqrt{2}\, e^{-\pi/48}$$

Decimal approximation:

- More digits

1.324617506375591934471444314212719187621133840185559647559...

Open code

Property:

$\sqrt{2}\, e^{-\pi/48}$ is a transcendental number

Continued fraction:

- Linear form

$$1+\cfrac{1}{3+\cfrac{1}{12+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{22+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Alternative representations:

- More

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}} = \frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{90^\circ}}{64}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}} = \frac{\sqrt[4]{2}}{\sqrt[24]{\frac{1}{64}\, e^{-1/2\, i \log(-1)}}}$$

Open code

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}} = \frac{\sqrt[4]{2}}{\sqrt[24]{\frac{1}{64}\, \exp^{\frac{\pi}{2}}(z)}} \quad \text{for } z = 1$$

Now, multiplying for π, we obtain:

Pi * (((2)^1/4))/((e^(Pi/2)/64))^1/24

Input:

$$\pi \times \frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\sqrt{2}\, e^{-\pi/48}\, \pi$$

Decimal approximation:

- More digits

4.161408626845990728671118431728761374280315375757649345554...

Open code

Note that:

(((4.16140))^1/3))

Input interpretation:

$$\sqrt[3]{4.16140}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.60847...

This result is very near to the value of Haudorff dimension of golden dragon 1,61803

Alternate form:

$$e^{-\pi/48}\,\pi\sqrt{2}$$

Continued fraction:

- Linear form

$$4+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{17+\cfrac{1}{35+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{143+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Alternative representations:

- More

$$\frac{\pi\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}}=\frac{180^\circ\sqrt[4]{2}}{\sqrt[24]{\frac{e^{90^\circ}}{64}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\pi\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}}=-\frac{i\left(\log(-1)\sqrt[4]{2}\right)}{\sqrt[24]{\frac{1}{64}\,e^{-1/2\,i\log(-1)}}}$$

Open code

$$\frac{\pi\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}}=\frac{\pi\sqrt[4]{2}}{\sqrt[24]{\frac{1}{64}\exp^{\frac{\pi}{2}}(z)}}\quad\text{for } z=1$$

We note that the result 4,161408 is in the range of the mass of hypothetical dark matter particles!

[(((2)^1/4)))] / [(((((sqrt(13)-3))/2))^6)))*(e^(Pi/2))))]^1/24

Input:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{\sqrt{2}\, e^{-\pi/48}}{\sqrt[4]{\sqrt{13}-3}}$$

Decimal approximation:

- More digits

1.501594813815632298117143170144000760471433477698568044796...

Open code

Property:

$$\frac{\sqrt{2}\, e^{-\pi/48}}{\sqrt[4]{-3+\sqrt{13}}}$$ is a transcendental number

Now:

((8sqrt(3)/(5)) * [(((2)^1/4)))] / [(((((sqrt(13)-3))/2))^6)))*(e^(Pi/2))))]^1/24

Input:

$$\left(8\times\frac{\sqrt{3}}{5}\right)\times\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{8\sqrt{6}\, e^{-\pi/48}}{5\sqrt[4]{\sqrt{13}-3}}$$

Decimal approximation:

- More digits

4.161341615856966183723758403503921686088609377218368676314...

Open code

Property:

$$\frac{8\sqrt{6}\, e^{-\pi/48}}{5\sqrt[4]{-3+\sqrt{13}}}$$ is a transcendental number

Alternate form:

$$\frac{8}{5}\sqrt{3}\sqrt[4]{3+\sqrt{13}}\ e^{-\pi/48}$$

Continued fraction:

- Linear form

$$4+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{20+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{18+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{\sqrt[4]{2}\ 8\sqrt{3}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}\ 5} = \frac{8\sqrt{2}\ e^{-\pi/2}\sqrt{2}\left(\sum_{k=0}^{\infty} 2^{-k}\binom{\frac{1}{2}}{k}\right)\left(e^{\pi/2}\left(-3+\sqrt{12}\sum_{k=0}^{\infty} 12^{-k}\binom{\frac{1}{2}}{k}\right)^6\right)^{23/24}}{5\left(-3+\sqrt{12}\sum_{k=0}^{\infty} 12^{-k}\binom{\frac{1}{2}}{k}\right)^6}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\sqrt[4]{2}\ 8\sqrt{3}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}\ 5}} = \frac{8\sqrt{2}\ e^{-\pi/2}\sqrt{2}\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\left(e^{\pi/2}\left(-3+\sqrt{12}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{12}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^6\right)^{23/24}}{5\left(-3+\sqrt{12}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{12}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^6}$$

Open code

$$\frac{\sqrt[4]{2}\ 8\sqrt{3}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}\ 5}} = \left(8\sqrt{2}\ e^{-\pi/2}\sqrt{z_0}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (3-z_0)^k z_0^{-k}}{k!}\right)\left(e^{\pi/2}\left(-3+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (13-z_0)^k z_0^{-k}}{k!}\right)^6\right)^{23/24}\right) / \left(5\left(-3+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (13-z_0)^k z_0^{-k}}{k!}\right)^6\right)$$

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

We note that the result 4,161341 is in the range of the mass of hypothetical dark matter particles!

[(((2)^1/4)))] / [((((sqrt(5)-2))^2)))*(e^(Pi/2))))]^1/24

Input:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\sqrt{5}-2\right)^2 e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{\sqrt[4]{2}\ e^{-\pi/48}}{\sqrt[12]{\sqrt{5}-2}}$$

Decimal approximation:

- More digits

1.256261069658771115857952330565559675209621503594863389621...

Open code

Property:

$$\frac{\sqrt[4]{2}\, e^{-\pi/48}}{\sqrt[12]{-2+\sqrt{5}}} \text{ is a transcendental number}$$

Now:

13/(sqrt(16)) * [(((2)^1/4)))] / [((((sqrt(5)-2))^2))*(e^(Pi/2))))]^1/24

Input:

$$\frac{13}{\sqrt{16}} \times \frac{\sqrt[4]{2}}{\sqrt[24]{(\sqrt{5}-2)^2\, e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{13\, e^{-\pi/48}}{2 \times 2^{3/4}\, \sqrt[12]{\sqrt{5}-2}}$$

Decimal approximation:

- More digits

4.082848476391006126538345074338068944431269886683306016270...

Open code

note that:

(((4.082848))^1/3))

Input interpretation:

$$\sqrt[3]{4.082848}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.598286...

This result is very near to the Hausdorff dimension 1,5849

Property:

$$\frac{13\, e^{-\pi/48}}{2 \times 2^{3/4}\, \sqrt[12]{-2+\sqrt{5}}} \text{ is a transcendental number}$$

Open code

Alternate form:

$$\frac{13}{4} \sqrt[4]{1+\sqrt{5}}\; e^{-\pi/48}$$

Continued fraction:

- Linear form

$$4+\cfrac{1}{12+\cfrac{1}{14+\cfrac{1}{4+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{18+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{\sqrt[4]{2}\,13}{\sqrt[24]{(\sqrt{5}-2)^2 e^{\pi/2}}\,\sqrt{16}} = \frac{13\sqrt[4]{2}\,e^{-\pi/2}\left(e^{\pi/2}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^2\right)^{23/24}}{\sqrt{15}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^2\sum_{k=0}^{\infty}15^{-k}\binom{\frac{1}{2}}{k}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\sqrt[4]{2}\,13}{\sqrt[24]{(\sqrt{5}-2)^2 e^{\pi/2}}\,\sqrt{16}} = \frac{13\sqrt[4]{2}\,e^{-\pi/2}\left(e^{\pi/2}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^2\right)^{23/24}}{\sqrt{15}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^2\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{15}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

$$\frac{\sqrt[4]{2}\,13}{\sqrt[24]{(\sqrt{5}-2)^2 e^{\pi/2}}\,\sqrt{16}} = \frac{13\sqrt[4]{2}\,e^{-\pi/2}\left(e^{\pi/2}\left(-2+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^2\right)^{23/24}}{\sqrt{z_0}\left(-2+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^2\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(16-z_0)^k z_0^{-k}}{k!}}$$

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

We note that the result 4,082848 is in the range of the mass of hypothetical dark matter particles.

[(((2)^1/4)))] / [(((2-(sqrt(3)))^4))*(e^(Pi/2))))]^1/24

Input:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{\sqrt[4]{2}\, e^{-\pi/48}}{\sqrt[6]{2-\sqrt{3}}}$$

Decimal approximation:

- More digits
  1.387259101481799979836563776693892538015050036729581624008...

Open code

Property:

$$\frac{\sqrt[4]{2}\, e^{-\pi/48}}{\sqrt[6]{2-\sqrt{3}}}$$ is a transcendental number

Now:

3 * [(((2)^1/4)))] / [(((2-(sqrt(3)))^4))*(e^(Pi/2))))]^1/24

Input:

$$3\times\frac{\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{3\sqrt[4]{2}\, e^{-\pi/48}}{\sqrt[6]{2-\sqrt{3}}}$$

Decimal approximation:

- More digits
  4.161777304445399939509691330081677614045150110188744872024...

Open code

Property:

$$\frac{3\sqrt[4]{2}\,e^{-\pi/48}}{\sqrt[6]{2-\sqrt{3}}} \text{ is a transcendental number}$$

Alternate forms:

$$3\sqrt[4]{2}\,\sqrt[6]{2+\sqrt{3}}\,e^{-\pi/48}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$3\sqrt[4]{2}\,\sqrt[12]{7+4\sqrt{3}}\,e^{-\pi/48}$$

Continued fraction:

- Linear form

$$4+\cfrac{1}{6+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{16+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{3\sqrt[4]{2}}{\sqrt[24]{\left(2-\sqrt{3}\right)^4 e^{\pi/2}}} = \frac{3\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(-2+\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)^4}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{3\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}} = \frac{3\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(-2+\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^4}}$$

Open code

$$\frac{3\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}} = \frac{3\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(2-\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j} 2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)^4}}$$

We note that the result 4,161777 is in the range of the mass of hypothetical dark matter particles!

We have also that:

[36^2 [(((2)^1/4)))] / [(((2-(sqrt(3)))^4))*(e^(Pi/2))))]^1/24] – 72

Input:

$$36^2 \times \frac{\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}} - 72$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{1296\sqrt[4]{2}\, e^{-\pi/48}}{\sqrt[6]{2-\sqrt{3}}} - 72$$

Decimal approximation:

- More digits

1725.887795520412773868186654595284729267504847601537784714...

Open code

result that is practically in the range of the mass of the candidate “glueball” $f_0(1710)$.

Property:

$$-72 + \frac{1296\sqrt[4]{2}\, e^{-\pi/48}}{\sqrt[6]{2-\sqrt{3}}} \text{ is a transcendental number}$$

Continued fraction:

- Linear form

$$1725+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{15+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{25+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{36^2\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}-72=-72+\frac{1296\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(2-\sqrt{2}\sum_{k=0}^{\infty}2^{-k}\binom{\frac{1}{2}}{k}\right)^4}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{36^2\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}-72=-72+\frac{1296\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(2-\sqrt{2}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^4}}$$

Open code

$$\frac{36^2\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}-72=-72+\frac{1296\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(2-\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}2^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)^4}}$$

[37^2 [(((2)^1/4)))] / [(((((sqrt(5)-2))^2)))*(e^(Pi/2))))]^1/24]

Input:

$$37^2\times\frac{\sqrt[4]{2}}{\sqrt[24]{(\sqrt{5}-2)^2 e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{1369\sqrt[4]{2}\,e^{-\pi/48}}{\sqrt[12]{\sqrt{5}-2}}$$

Decimal approximation:

- More digits

1719.821404362857657609536740544251195361971838421367980392...

Open code

result that is practically in the range of the mass of the candidate “glueball” $f_0(1710)$.

Property:

$$\frac{1369\sqrt[4]{2}\,e^{-\pi/48}}{\sqrt[12]{-2+\sqrt{5}}} \text{ is a transcendental number}$$

Continued fraction:

- Linear form

$$1719+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{52+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{37^2\sqrt[4]{2}}{\sqrt[24]{(\sqrt{5}-2)^2\,e^{\pi/2}}}=\frac{1369\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^2}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{37^2\sqrt[4]{2}}{\sqrt[24]{\left(\sqrt{5}-2\right)^2 e^{\pi/2}}} = \frac{1369\sqrt[4]{2}}{\sqrt[24]{e^{\pi/2}\left(-2+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^2}}$$

Open code

$$\frac{37^2\sqrt[4]{2}}{\sqrt[24]{\left(\sqrt{5}-2\right)^2 e^{\pi/2}}} = \frac{1369\sqrt[3]{2}}{\sqrt[24]{\frac{e^{\pi/2}\left(-4\sqrt{\pi}+\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j} 4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)^2}{\sqrt{\pi}^2}}}$$

-

34^2 [(((2)^1/4)))] / [(((((sqrt(13)-3))/2))^6)))*(e^(Pi/2))))]^1/24 - 8

Input:

$$34^2 \times \frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}} - 8$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{1156\sqrt{2}\,e^{-\pi/48}}{\sqrt[4]{\sqrt{13}-3}} - 8$$

Decimal approximation:

- More digits

1727.843604770870936623417504686464879104977100219544659784...

Open code

result that is practically in the range of the mass of the candidate “glueball” $f_0(1710)$.

Property:

$$-8 + \frac{1156\sqrt{2}\,e^{-\pi/48}}{\sqrt[4]{-3+\sqrt{13}}}$$ is a transcendental number

Continued fraction:

- Linear form

$$1727+\frac{1}{1+\frac{1}{5+\frac{1}{2+\frac{1}{1+\frac{1}{1+\frac{1}{6+\frac{1}{7+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{17+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{5+\frac{1}{1+\frac{1}{8+\frac{1}{1+\frac{1}{1+\frac{1}{5+\frac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{34^2\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}-8=-8+\frac{1156\sqrt{2}}{\sqrt[24]{e^{\pi/2}\left(-3+\sqrt{12}\sum_{k=0}^{\infty}12^{-k}\binom{\frac{1}{2}}{k}\right)^6}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{34^2\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}-8=-8+\frac{1156\sqrt{2}}{\sqrt[24]{e^{\pi/2}\left(-3+\sqrt{12}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{12}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^6}}$$

Open code

$$\frac{34^2\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}-8=-8+\frac{1156\sqrt{2}}{\sqrt[24]{e^{\pi/2}\left(-3+\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}12^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)^6}}$$

36^2 (((2)^1/4))/((e^(Pi/2)/64))^1/24 +12

Input:

$$36^2 \times \frac{\sqrt[4]{2}}{\sqrt[24]{\frac{e^{\pi/2}}{64}}} + 12$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$12 + 1296\sqrt{2}\, e^{-\pi/48}$$

Decimal approximation:

- More digits

1728.704288262767147074991831219684067156989456880485303236...

Open code

result that is practically in the range of the mass of the candidate "glueball" $f_0(1710)$.

Property:

$12 + 1296\sqrt{2}\, e^{-\pi/48}$ is a transcendental number

19^2 exp (((([(((2)^1/4)))] / [((((sqrt(13)-3))/2))^6)))*(e^(Pi/2))))]^1/24)))) + 108

Input:

$$19^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}\right) + 108$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$108 + 361\, e^{\left(\sqrt{2}\, e^{-\pi/48}\right)/\sqrt[4]{\sqrt{13}-3}}$$

Decimal approximation:

- More digits

1728.472045914290251685891038147883422736286255489049568183...

Open code

result that is practically in the range of the mass of the candidate "glueball" $f_0(1710)$.

Continued fraction:

- Linear form

$$1728+\cfrac{1}{2+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$19^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}\right)+108=$$

$$108+361\exp\left(\frac{\sqrt{2}}{\sqrt[24]{\left(\sum_{k=-\infty}^{\infty} I_k\left(\frac{\pi}{2}\right)\right)\left(-3+\sqrt{12}\sum_{k=0}^{\infty} 12^{-k}\binom{\frac{1}{2}}{k}\right)^6}}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$19^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}\right)+108=108+361$$

$$\exp\left(\frac{\sqrt{2}}{\sqrt[24]{\left(\sum_{k=0}^{\infty}\frac{2^{-k}\pi^k}{k!}\right)\left(-3+\exp\left(i\pi\left\lfloor\frac{\arg(13-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(13-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^6}}\right)$$

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

Open code

$$19^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\frac{1}{2}\left(\sqrt{13}-3\right)\right)^6 e^{\pi/2}}}\right) + 108 = 108 + 361$$

$$\exp\left(\frac{\sqrt{2}}{\sqrt[24]{\left(\sum_{k=-\infty}^{\infty} I_k\left(\frac{\pi}{2}\right)\right)\left(-3+\exp\left(i\pi\left\lfloor\frac{\arg(13-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (13-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^6}}\right)$$

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

21^2 exp ((([(((2)^1/4)))] / [(((2-(sqrt(3)))^4))*(e^(Pi/2))))]^1/24))) – 36

Input:

$$21^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(2-\sqrt{3}\right)^4 e^{\pi/2}}}\right) - 36$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$441\, e^{\left(\sqrt[4]{2}\, e^{-\pi/48}\right)/\sqrt[6]{2-\sqrt{3}}} - 36$$

Decimal approximation:

- More digits

1729.702623160994366269669828444240734092512565080816424227...

Open code

result that is practically in the range of the mass of the candidate “glueball” $f_0(1710)$.

Continued fraction:

- Linear form

$$1729 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{8 + \cfrac{1}{1 + \cfrac{1}{10 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{39 + \cfrac{1}{1 + \cfrac{1}{4 + \cfrac{1}{1 + \cfrac{1}{12 + \cfrac{1}{1 + \cfrac{1}{7 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{\ddots}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$21^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}\right) - 36 =$$

$$9\left(-4 + 49 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\sum_{k=-\infty}^{\infty} I_k\left(\frac{\pi}{2}\right)\right)\left(-2+\sqrt{2}\sum_{k=0}^{\infty} 2^{-k}\binom{\frac{1}{2}}{k}\right)^4}}\right)\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$21^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}\right) - 36 = 9\left(-4 + 49 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\sum_{k=0}^{\infty} \frac{2^{-k}\pi^k}{k!}\right)\left(-2+\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^4}}\right)\right)$$

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

Open code

$$21^2 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{(2-\sqrt{3})^4 e^{\pi/2}}}\right) - 36 = 9\left(-4 + 49 \exp\left(\frac{\sqrt[4]{2}}{\sqrt[24]{\left(\sum_{k=-\infty}^{\infty} I_k\left(\frac{\pi}{2}\right)\right)\left(2-\exp\left(i\pi\left\lfloor\frac{\arg(3-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (3-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^4}}\right)\right)$$

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

((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24)))

Input:

$$\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$$\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - \frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)^{24}$$

Decimal approximation:

- More digits

0.00015159590277312254590638515316736416676020053763695076 4...

Open code

1/2 ln((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24)))

Input:

$$\frac{1}{2}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$12\log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

-4.3971460558418715653320346625918429139828854531481449706 2...

Note that:

(((4.397146))^1/3))

Input interpretation:

$$\sqrt[3]{4.397146}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.638288...

This value is practically equal to the value of Fibonacci word fractal Hausdorff dimension 1,6379

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{46+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{11+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{7+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Open code

This result -4,3971 is a good approximations of the mass of hypothetical dark matter particles with minus sign

Property:

$$12 \log\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right) \text{ is a transcendental number}$$

Open code

Continued fraction:

- Linear form

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

Series representations:

- More

$$\frac{1}{2}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)=$$
$$-12\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)=$$
$$-12\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$\frac{1}{2}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)=$$
$$24\,i\,\pi\left\lfloor\frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)}{2\,\pi}\right\rfloor+12\log(x)-$$
$$12\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)^k x^{-k}}{k}\quad\text{for } x<0$$

Integral representation:

$$\frac{1}{2}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)=12\int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)}\frac{1}{t}\,dt$$

ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * ((1.652)^2))

Input:

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 1.652^2$$

Open code

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

Result:

- More digits

$-24.0005\ldots$

This result is fundamental in string theory. (From Wikiversity) “1968 "Veneziano model" Euler beta function describes the strong nuclear force.

When a string moves in space-time by splitting and recombining (see worldsheet diagram at right), a large number of mathematical identities must be satisfied. These are the identities of Ramanujan's modular function.

The KSV loop diagrams of interacting strings can be described using modular functions.

The "Ramanujan function" (an elliptic modular function satisfies the need for "conformal symmetry") has 24 "modes" that correspond to the physical vibrations of a bosonic string.

When the Ramanujan function is generalized, 24 is replaced by 8 (8 + 2 = 10) for fermion strings.”

Series representations:

- More

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2 = -2.7291\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2 = 2.7291\log\left(\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{8}\right)^k\left(-\frac{1}{2}\right)_k\left(\left(-11+\sqrt{17}\right)^k-\left(-3+\sqrt{17}\right)^k\right)}{k!}\right)^{24}\right)$$

Open code

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2 = 5.45821\, i\,\pi\left\lfloor\frac{\arg\left(-x+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)}{2\pi}\right\rfloor+2.7291\log(x)-2.7291\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)^k}{k} \quad \text{for } x<0$$

Integral representation:

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2 = 2.7291\int_1^{\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}}\frac{1}{t}\,dt$$

ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * ((1.652)^2)) * 72

Input:

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 1.652^2\times 72$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1728.04\ldots$

The result -1728,04 is practically in the range of the mass of the candidate "glueball" $f_0(1710)$.

Series representations:

- More

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2\times 72 = -196.495\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2\times 72 = 196.495\log\left(\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{8}\right)^k\left(-\frac{1}{2}\right)_k\left(\left(-11+\sqrt{17}\right)^k-\left(-3+\sqrt{17}\right)^k\right)}{k!}\right)^{24}\right)$$

Open code

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2\times 72 =$$

$$392.991\, i\,\pi \left\lfloor \frac{\arg\left(-x+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)}{2\pi} \right\rfloor + 196.495 \log(x) -$$

$$196.495 \sum_{k=1}^{\infty} \frac{(-1)^k x^{-k} \left(-x+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)^k}{k} \quad \text{for } x < 0$$

Integral representation:

$$\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.652^2\times 72 =$$

$$196.495 \int_1^{\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}} \frac{1}{t}\,dt$$

1/6 ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * ((1.655784548676)^2))

Input interpretation:

$$\frac{1}{6}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 1.655784548676^2$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

-4.018438145918...

Note that:

Input interpretation:

$$\sqrt[3]{4.018438}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.589836...

This value is very near to the Hausdorff dimension 1,5849

This result -4,018438 is in the range of the mass of hypothetical dark matter particles with minus sign.

Series representations:

- More

$$\frac{1}{6}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.6557845486760000^2 = -0.45693707860569750\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{6}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.6557845486760000^2 = 0.45693707860569750\log\left(\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{8}\right)^k\left(-\frac{1}{2}\right)_k\left(\left(-11+\sqrt{17}\right)^k-\left(-3+\sqrt{17}\right)^k\right)}{k!}\right)^{24}\right)$$

Open code

$$\frac{1}{6}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.6557845486760000^2 = 0.9138741572113950\, i\pi\left\lfloor\frac{\arg\left(-x+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)}{2\pi}\right\rfloor + 0.45693707860569750\log(x)-0.45693707860569750\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)^k}{k} \quad \text{for } x<0$$

Integral representation:

$$\frac{1}{6}\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)1.6557845486760000^2 = 0.45693707860569750\int_1^{\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}}\frac{1}{t}\,dt$$

e * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 108

Input:

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 108$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$2592\, e \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

$-2581.779359665869479352606880533192668365991367263871830 28...$

Continued fraction:

- Linear form

$$-2581+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-7+\cfrac{1}{-4+\cfrac{1}{-53+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-3+\cfrac{1}{-5+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}$$

Series representations:

- More

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 108 = -2592\, e \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 108 = -2592\, e \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 108 = 5184\, i\, e\, \pi \left\lfloor \frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)} + \frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - x\right)}{2\pi} \right\rfloor + 2592\, e \log(x) - 2592\, e \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)} + \frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

Integral representation:

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 108 = 2592\, e \int_1^{-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}} \frac{1}{t}\, dt$$

The result -2581,779 is very near to the rest mass of charmed Xi prime baryon 2577.9±2.9 with minus sign

e * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 64

Input:

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) \times 64$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$1536\, e \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - \frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

−1529.94332424644117294969296624189195162429118060081293646...

Open code

Continued fraction:

- Linear form

$$-1529+\cfrac{1}{-1+\cfrac{1}{-16+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-4+\cfrac{1}{-3+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-69+\cfrac{1}{-2+\cfrac{1}{-9+\cfrac{1}{-2+\cfrac{1}{-3+\cfrac{1}{\dots}}}}}}}}}}}}}}}$$

Series representations:

- More

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)64 = -1536\, e \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)64 = -1536\, e \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)64 = 3072\, i\, e\, \pi \left\lfloor \frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)}{2\pi} \right\rfloor + 1536\, e \log(x) - 1536\, e \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

Integral representation:

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 64 =$$

$$1536\, e \int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)} \frac{1}{t}\, dt$$

This result -1529,943 is very near to the rest mass of Xi baryon 1531.80±0.32 with minus sign

e * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 72

Input:

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) \times 72$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$1728\, e \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

−1721.1862397724631956840458702212844557732757817591455352...

Open code

result that is practically in the range of the mass of the candidate "glueball" $f_0(1710)$.

Continued fraction:

- Linear form

$$-1721+\cfrac{1}{-5+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-2+\cfrac{1}{-2+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-8+\cfrac{1}{-3+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-2+\cfrac{1}{-8+\cfrac{1}{\cdots}}}}}}}}}}}}}}}$$

Series representations:

- More

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)72 = -1728\, e \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)72 = -1728\, e \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)72 = 3456\, i\, e\, \pi \left\lfloor \frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)}{2\pi} \right\rfloor + 1728\, e \log(x) - 1728\, e \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

Integral representation:

$$e \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)72 = 1728\, e \int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)} \frac{1}{t}\, dt$$

Pi * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 96

Input:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 96$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$2304\,\pi \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - \frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

$$-2652.296015192478422723509704208508598519888622812233979\,80\ldots$$

Open code

Continued fraction:

- Linear form

$$-2652+\cfrac{1}{-3+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-4+\cfrac{1}{-3+\cfrac{1}{-1+\cfrac{1}{-294+\cfrac{1}{-16+\cfrac{1}{-56+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{\ldots}}}}}}}}}}}}}}$$

Series representations:

- More

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 96 = -2304\,\pi \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 96 = -2304\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 96 =$$

$$4608\, i\, \pi^2 \left\lfloor \frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)} + \frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - x\right)}{2\pi} \right\rfloor + 2304\,\pi \log(x) -$$

$$2304\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)} + \frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

Integral representation:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 96 =$$

$$2304\,\pi \int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)} \frac{1}{t}\, dt$$

The result -2652,296 is very near to the rest mass of charmed Xi baryon 2645.9±0.5 with minus sign

Pi * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 48

Input:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) \times 48$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$1152\,\pi \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)} - \frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

−1326.148007596239211361754852104254299259944311406116989990...

Open code

Continued fraction:

- Linear form

$$-1326+\cfrac{1}{-6+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-9+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-589+\cfrac{1}{-8+\cfrac{1}{-113+\cfrac{1}{-6+\cfrac{1}{-1+\cfrac{1}{-15+\cfrac{1}{-4+\cfrac{1}{\ldots}}}}}}}}}}}}}}$$

Series representations:

- More

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)48 = -1152\,\pi\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)48 = -1152\,\pi\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)48 = 2304\,i\,\pi^2\left\lfloor\frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)}{2\pi}\right\rfloor+1152\,\pi\log(x)-1152\,\pi\sum_{k=1}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)^k x^{-k}}{k}\quad \text{for } x<0$$

Integral representation:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)48 =$$

$$1152\,\pi \int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)} \frac{1}{t}\,dt$$

This result -1326,148 is very near to the rest mass of Xi baryon 1321.71±0.07 with minus sign

Pi * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 216

Input:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 216$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$5184\,\pi \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

−5967.666034183076451127896834469144346669749401327526454 55...

Open code

Continued fraction:

- Linear form

$$-5967+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-175+\cfrac{1}{-131+\cfrac{1}{-36+\cfrac{1}{-25+\cfrac{1}{-6+\cfrac{1}{-1+\cfrac{1}{-71+\cfrac{1}{-2+\cfrac{1}{-2+\cfrac{1}{\dots}}}}}}}}}}}}}$$

Series representations:

- More

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 216 = -5184\,\pi \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 216 = -5184\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 216 = 10\,368\, i\, \pi^2 \left\lfloor \frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)}{2\pi} \right\rfloor + 5184\,\pi \log(x) - 5184\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

Integral representation:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)} - \sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 216 = 5184\,\pi \int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)} \frac{1}{t}\,dt$$

This value -5967,6 is a good approximation to the rest mass of bottom Xi baryon 5945.5±0.8±2.2 with minus sign

Pi * ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 192

Input:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) \times 192$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$4608\,\pi \log\left(\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{17}-3\right)}\right)$$

Decimal approximation:

- More digits

$-5304.592030384956845447019408417017197039777245624467959 60\ldots$

Open code

Continued fraction:

- Linear form

$$-5304+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-4+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-147+\cfrac{1}{-32+\cfrac{1}{-28+\cfrac{1}{\ldots}}}}}}}}}}}}}}$$

Series representations:

- More

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 192 = -4608\,\pi \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-4-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right) 192 = -4608\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k \left(-1-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}\right)^k}{k}$$

Open code

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)192 =$$

$$9216\, i\, \pi^2 \left\lfloor \frac{\arg\left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)}{2\pi} \right\rfloor + 4608\,\pi \log(x) -$$

$$4608\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\sqrt{\frac{1}{2}\left(-3+\sqrt{17}\right)}+\frac{1}{2}\sqrt{\frac{1}{2}\left(5+\sqrt{17}\right)}-x\right)^k x^{-k}}{k} \quad \text{for } x < 0$$

Integral representation:

$$\pi \log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)192 =$$

$$4608\,\pi \int_1^{\frac{1}{4}\left(-\sqrt{2\left(-3+\sqrt{17}\right)}+\sqrt{2\left(5+\sqrt{17}\right)}\right)} \frac{1}{t}\, dt$$

This value -5304,592 is a good approximation to the rest mass of B meson 5325.1±0.5 with minus sign

Now:

(((((- ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * ((1.645)^2)) *1/((1.08663428)^13)) *10^53)))))

Input interpretation:

$$\left(\left(-\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 1.645^2\right)\times \frac{1}{1.08663428^{13}}\right)\times 10^{53}$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$8.08069\ldots \times 10^{53}$

≈ the size of the Monster group ($\approx 8.1\times10^{53}$)

Series representations:

- More

$$\frac{10^{53}\left(-\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)1.645^2\right)}{1.08663^{13}}=$$

$$9.18856\times10^{52}\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1+\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{10^{53}\left(-\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)1.645^2\right)}{1.08663^{13}}=$$

$$-9.18856\times10^{52}\log\left(\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{8}\right)^k\left(-\frac{1}{2}\right)_k\left((-11+\sqrt{17})^k-(-3+\sqrt{17})^k\right)}{k!}\right)^{24}\right)$$

Open code

$$\frac{10^{53}\left(-\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)1.645^2\right)}{1.08663^{13}}=$$

$$-1.83771\times10^{53}\,i\,\pi\left\lfloor\frac{\arg\left(-x+\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)}{2\pi}\right\rfloor-$$

$$9.18856\times10^{52}\log(x)+9.18856\times10^{52}\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}\left(-x+\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)^k}{k}\quad\text{for } x<0$$

Integral representation:

$$\frac{10^{53}\left(-\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)1.645^2\right)}{1.08663^{13}}=$$

$$-9.18856\times10^{52}\int_1^{\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}}\frac{1}{t}\,dt$$

ln(((((- ln ((([sqrt(((5+sqrt(17))/8))) - sqrt(((sqrt(17)-3))/8)))]^24))) * 2Pi/((1.08663428)^13)) *10^53)))))

Input interpretation:

$$\log\left(\left(-\log\left(\left(\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(\sqrt{17}-3\right)}\right)^{24}\right)\times 2\times\frac{\pi}{1.08663428^{13}}\right)\times 10^{53}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

124.9688835...

Series representations:

- More

$$\log\left(\frac{10^{53}(-1)\left(\pi\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)2\right)}{1.08663^{13}}\right)=$$

$$\log\left(-1-6.79119\times 10^{52}\,\pi\log\left(\left(\sqrt{\frac{1}{8}\left(-3+\sqrt{17}\right)}-\sqrt{\frac{1}{8}\left(5+\sqrt{17}\right)}\right)^{24}\right)\right)-$$

$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(-1-6.79119\times 10^{52}\,\pi\log\left(\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)\right)^{-k}}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\log\left(\frac{10^{53}(-1)\left(\pi\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)2\right)}{1.08663^{13}}\right)=$$

$$\log\left(-6.79119\times 10^{52}\,\pi\log\left(\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{8}\right)^k\left(-\frac{1}{2}\right)_k\left(\left(-11+\sqrt{17}\right)^k-\left(-3+\sqrt{17}\right)^k\right)}{k!}\right)^{24}\right)\right)$$

Open code

$$\log\left(\frac{10^{53}(-1)\left(\pi\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)2\right)}{1.08663^{13}}\right)=$$

$$2 i\pi\left\lfloor\frac{\arg\left(-x-6.79119\times10^{52}\,\pi\log\left(\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)\right)}{2\pi}\right\rfloor+$$

$$\log(x)-\sum_{k=1}^{\infty}\frac{(-1)^k x^{-k}\left(-x-6.79119\times10^{52}\,\pi\log\left(\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)\right)^k}{k}$$

for $x < 0$

Integral representations:

$$\log\left(\frac{10^{53}(-1)\left(\pi\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)2\right)}{1.08663^{13}}\right)=$$

$$\int_1^{-6.79119\times10^{52}\,\pi\log\left(\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)}\frac{1}{t}\,dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\log\left(\frac{10^{53}(-1)\left(\pi\log\left(\left(\sqrt{\frac{1}{8}(5+\sqrt{17})}-\sqrt{\frac{1}{8}(\sqrt{17}-3)}\right)^{24}\right)2\right)}{1.08663^{13}}\right)=$$

$$\frac{1}{2 i\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{1}{\Gamma(1-s)}\Gamma(-s)^2\,\Gamma(1+s)\left(-1-6.79119\times10^{52}\,\pi\log\left(\left(\sqrt{\frac{1}{8}(-3+\sqrt{17})}-\sqrt{\frac{1}{8}(5+\sqrt{17})}\right)^{24}\right)\right)^{-s}ds \quad \text{for } -1<\gamma<0$$

This value 124,968 is practically equal to the mass of Higgs boson 125.18 ± 0.16 GeV/*c*

Now, from:

AN OVERVIEW OF RAMANUJAN'S NOTEBOOKS

BRUCE C. BERNDT

Let $\chi(q) = (-q;q^2)_\infty$. If $q = \exp(-\pi\sqrt{n})$, where n is any positive rational number, then Ramanujan's two class invariants G_n and g_n are defined by

$$G_n := 2^{-1/4}q^{-1/24}\chi(q) \qquad \text{and} \qquad g_n := 2^{-1/4}q^{-1/24}\chi(-q).$$

And

NOTES ON RAMANUJAN'S SINGULAR MODULI

BRUCE C. BERNDT AND HENG HUAT CHAN

1. Introduction

Singular moduli arise in the calculation of class invariants, and so we first define the class invariants of Ramanujan and Weber. Set

$$(a;q)_\infty = \prod_{n=0}^{\infty}(1-aq^n), \qquad |q| < 1,$$

and

$$\chi(q) = (-q;q^2)_\infty. \tag{1.1}$$

If

$$q - \exp(-\pi\sqrt{n}), \tag{1.2}$$

where n is a positive integer, the *class invariants* G_n and g_n are defined by

$$G_n := 2^{-1/4}q^{-1/24}\chi(q) \qquad \text{and} \qquad g_n := 2^{-1/4}q^{-1/24}\chi(-q). \tag{1.3}$$

In the notation of Weber [8], $G_n =: 2^{-1/4}f(\sqrt{-n})$ and $g_n =: 2^{-1/4}f_1(\sqrt{-n})$.

As usual, in the theory of elliptic functions, let $k := k(q)$, $0 < k < 1$, denote the modulus. The singular modulus k_n is defined by $k_n := k(e^{-\pi\sqrt{n}})$, where n is a natural number. Following Ramanujan, set $\alpha_n = k_n^2$.

And

$$g_n = \left\{4\alpha_n(1-\alpha_n)^{-2}\right\}^{-1/24}$$

For k = 0.5 and n = 4, we obtain:

((((4(((0.5 *e^(-2Pi))^2))) * (1-((0.5 *e^(-2Pi))^2))^-2))))^-1/24

Input:

$$\left(\frac{4\left(0.5\,e^{-2\pi}\right)^2}{\left(1-\left(0.5\,e^{-2\pi}\right)^2\right)^2}\right)^{-1/24}$$

Open code

Result:

- More digits

1.688092...

This result is very near to the Hausdorff dimension 1,6826

For n = 4 and g_n = 1,688092..., we have that:

[(((2)^1/4)))] / [((1.688092)*(e^(4Pi))))]^1/24]

Input interpretation:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.688092\,e^{4\pi}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.68926560...

This result is very near to the Haudorff dimension of Asymmetric Cantor set 0,6942 and 1,688092 is very near to the Hd 1,6826

Series representations:

- More

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.68809\,e^{4\pi}}} = \frac{1.16354}{\sqrt[24]{\left(\sum_{k=0}^{\infty}\frac{1}{k!}\right)^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.68809\,e^{4\pi}}} = \frac{1.16354}{\sqrt[24]{\left(\sum_{k=0}^{\infty}\frac{(-1+k)^2}{k!}\right)^{16\sum_{k=0}^{\infty}(-1)^k/(1+2k)}}}$$

Open code

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.68809\, e^{4\pi}}} = \frac{1.16354}{\sqrt[24]{\left(\sum_{k=0}^{\infty} \frac{1}{k!}\right)^{16} \sum_{k=1}^{\infty} \tan^{-1}(1/F_{1+2k})}}$$

Open code

Integral representations:

- More

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.68809\, e^{4\pi}}} = \frac{1.16354}{\sqrt[24]{e^{8 \int_0^{\infty} 1/(1+t^2)\, dt}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.68809\, e^{4\pi}}} = \frac{1.16354}{\sqrt[24]{e^{16 \int_0^1 \sqrt{1-t^2}\, dt}}}$$

Open code

$$\frac{\sqrt[4]{2}}{\sqrt[24]{1.68809\, e^{4\pi}}} = \frac{1.16354}{\sqrt[24]{e^{8 \int_0^{\infty} \sin(t)/t\, dt}}}$$

[(((2)^1/4)))] / [(((1/64)*(e^(Pi/2))))]^1/24]

Input:

$$\frac{\sqrt[4]{2}}{\sqrt[24]{\frac{1}{64}\, e^{\pi/2}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\sqrt{2}\, e^{-\pi/48}$$

Decimal approximation:

- More digits

1.324617506375591934471444314212719187621133840185559647559...

Open code

This value is very near to the Hausdorff dimension of “5 circles inversion fractal” 1,328

Property:

$\sqrt{2}\, e^{-\pi/48}$ is a transcendental number

Now, we have that for $64g_{2n} = G_n * g_n$; $g_{2n} = (G_n * g_n)/64$:

(1.3246175063755919344714443142127191876211338401855596475 59 * 1.688092)/64

Result:

- More digits

0.0349386908683216521850901464885621493573396104147894024446...

Continued fraction:

- Linear form

$$\cfrac{1}{28+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{24+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}}$$

(3Pi)/2 * ln(((1.324617506375591934471444314212719187621133840185559647559 * 1.688092)/64))

Input interpretation:

$$\frac{3\pi}{2}\log\left(\frac{1}{64}\,1.324617506375591934471444314212719187621133840185559647559\times 1.688092\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-15.806109\ldots$

Series representations:

- More

$$\frac{1}{2}\log\left(\frac{1}{64}\right. 1.324617506375591934471444314212719187621133840185559647559 0000 \times 1.68809\left.\right)(3\pi) = -\frac{3}{2}\pi\sum_{k=1}^{\infty}\frac{(-1)^k(-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\log\left(\frac{1}{64}\right. 1.324617506375591934471444314212719187621133840185559647559 0000 \times 1.68809\left.\right)(3\pi) = 3 i \pi^2 \left\lfloor \frac{\arg(0.0349387 - x)}{2\pi} \right\rfloor + \frac{3}{2}\pi\log(x) - \frac{3}{2}\pi\sum_{k=1}^{\infty}\frac{(-1)^k(0.0349387 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$\frac{1}{2}\log\left(\frac{1}{64}\right. 1.324617506375591934471444314212719187621133840185559647559 0000 \times 1.68809\left.\right)(3\pi) = 3 i \pi^2 \left\lfloor -\frac{-\pi + \arg\left(\frac{0.0349387}{z_0}\right) + \arg(z_0)}{2\pi} \right\rfloor + \frac{3}{2}\pi\log(z_0) - \frac{3}{2}\pi\sum_{k=1}^{\infty}\frac{(-1)^k(0.0349387 - z_0)^k z_0^{-k}}{k}$$

Integral representation:

$$\frac{1}{2}\log\left(\frac{1}{64}\right. 1.324617506375591934471444314212719187621133840185559647559 0000 \times 1.68809\left.\right)(3\pi) = \frac{3\pi}{2}\int_1^{0.0349387}\frac{1}{t}\,dt$$

Open code

This result -15,806 is practically equal to the black hole entropy (see Table)

-0.688092 + ln(((1.324617506375591934471444314212719187621133840185559647559 * 1.688092)/64))

Input interpretation:

$$-0.688092 + \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647559 \times 1.688092\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-4.042252...$

Note that:

Input interpretation:

$$\sqrt[3]{4.042252}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.592971...$

This result is very near to the Hausdorff dimension 1,5849

Series representations:

- More

$$-0.688092 + \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596475590000 \times 1.68809\right) = -0.688092 - \sum_{k=1}^{\infty} \frac{(-1)^k (-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-0.688092 + \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900\cdot 00 \times 1.68809\right) = -0.688092 + 2 i \pi \left\lfloor \frac{\arg(0.0349387 - x)}{2 \pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$-0.688092 + \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647559 0000 \times 1.68809\right) = -0.688092 + \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - z_0)^k z_0^{-k}}{k}$$

Open code

Integral representation:

$$-0.688092 + \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596475590000 \times 1.68809\right) = -0.688092 + \int_1^{0.0349387} \frac{1}{t}\, dt$$

The result -4,042 is in the range of the mass of hypothetical dark matter particles with minus sign.

512 * ln (((1.324617506375591934471444314212719187621133840185559647559 * 1.688092)/64))

Input interpretation:

$$512 \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647559 \times 1.688092\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1717.3301\ldots$

Series representations:

- More

$$512 \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596475590000 \times 1.68809\right) = -512 \sum_{k=1}^{\infty} \frac{(-1)^k (-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$512 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900\ldots 00 \times 1.68809\right) = 1024 i \pi \left\lfloor \frac{\arg(0.0349387 - x)}{2\pi} \right\rfloor + 512 \log(x) - 512 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$512 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900000 \times 1.68809\right) = 512 \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + 512 \log(z_0) + 512 \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log(z_0) - 512 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - z_0)^k z_0^{-k}}{k}$$

Open code

Integral representation:

$$512 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900000 \times 1.68809\right) = 512 \int_1^{0.0349387} \frac{1}{t} \, dt$$

Open code

The result -1717,33 is practically in the range of the mass of the candidate "glueball" $f_0(1710)$ with minus sign.

16 - 25^2 * ln (((1.324617506375591934471444314212719187621133840185559647559 * 1.688092)/64))

Input interpretation:

$$16 - 25^2 \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647559 \times 1.688092\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

2112.3503...

Series representations:

- More

$$16 - 25^2 \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596475590000 \times 1.68809\right) = 16 + 625 \sum_{k=1}^{\infty} \frac{(-1)^k (-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$16 - 25^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900000 \times 1.68809\right) = 16 - 1250\, i \pi \left\lfloor \frac{\arg(0.0349387 - x)}{2\pi} \right\rfloor - 625 \log(x) + 625 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$16 - 25^2 \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596475590000 \times 1.68809\right) = 16 - 625 \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) - 625 \log(z_0) - 625 \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log(z_0) + 625 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - z_0)^k z_0^{-k}}{k}$$

Open code

Integral representation:

$$16 - 25^2 \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596475590000 \times 1.68809\right) = 16 - 625 \int_1^{0.0349387} \frac{1}{t}\, dt$$

Open code

This result 2112,35 is practically equal to the rest mass of strange D meson 2112.3±0.5

8 - 27^2 * ln (((1.324617506375591934471444314212719187621133840185559647559 * 1.688092)/64))

Input interpretation:

$$8 - 27^2 \log\left(\frac{1}{64}\, 1.324617506375591934471444314212719187621133840185559647559 \times 1.688092\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

2453.1830...

Series representations:

- More

$$8 - 27^2 \log\left(\frac{1}{64}\, 1.32461750637559193447144431421271918762113384018555964755900\cdot.\, 00 \times 1.68809\right) = 8 + 729 \sum_{k=1}^{\infty} \frac{(-1)^k (-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$8 - 27^2 \log\left(\frac{1}{64}\, 1.324617506375591934471444314212719187621133840185559647559\cdot.\, 0000 \times 1.68809\right) = 8 - 1458\, i\, \pi \left\lfloor \frac{\arg(0.0349387 - x)}{2\,\pi} \right\rfloor - 729 \log(x) + 729 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - x)^k\, x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$8 - 27^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900\text{⋯} 00 \times 1.68809\right) = 8 - 729 \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) - 729 \log(z_0) - 729 \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log(z_0) + 729 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - z_0)^k z_0^{-k}}{k}$$

Open code

Integral representation:

$$8 - 27^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964755900\text{⋯} 00 \times 1.68809\right) = 8 - 729 \int_1^{0.0349387} \frac{1}{t}\, dt$$

This result 2453,18 is very near to the rest mass of charmed Sigma baryon 2452.9±0.4

(((18 - 27^2 * ln (((1.32461750637559193447144431421271918762113384018555964755 9 * 1.688092)/64))))*1/2

Input interpretation:

$$\left(18 - 27^2 \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647559 \times 1.688092\right)\right) \times \frac{1}{2}$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1231.5915...

Series representations:

- More

$$\frac{1}{2}\left(18 - 27^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964 75\text{`.} \; 590000 \times 1.68809\right)\right) = 9 + \frac{729}{2}\sum_{k=1}^{\infty}\frac{(-1)^k(-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\left(18 - 27^2 \log\left(\frac{1}{64} 1.3246175063755919344714443142127191876211338401855596 47\text{`.} \; 5590000 \times 1.68809\right)\right) = 9 - 729\, i\, \pi \left\lfloor \frac{\arg(0.0349387 - x)}{2\pi} \right\rfloor - \frac{729 \log(x)}{2} + \frac{729}{2}\sum_{k=1}^{\infty}\frac{(-1)^k (0.0349387 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$\frac{1}{2}\left(18 - 27^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964 75\text{`.} \; 590000 \times 1.68809\right)\right) = 9 - \frac{729}{2}\left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) - \frac{729 \log(z_0)}{2} - \frac{729}{2}\left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log(z_0) + \frac{729}{2}\sum_{k=1}^{\infty}\frac{(-1)^k (0.0349387 - z_0)^k z_0^{-k}}{k}$$

Open code

Integral representation:

$$\frac{1}{2}\left(18 - 27^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964 75\text{`.} \; 590000 \times 1.68809\right)\right) = 9 - \frac{729}{2}\int_1^{0.0349387}\frac{1}{t}\, dt$$

Open code

This result 1231,59 is very near to the rest mass of Delta baryon 1232±2

(((192 + 33^2 * ln (((1.324617506375591934471444314212719187621133840185559647559 * 1.688092)/64))))*1/2

Input interpretation:

$$\left(192+33^2 \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647559 \times 1.688092\right)\right) \times \frac{1}{2}$$

Open code

log(x) is the natural logarithm

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1730.3404\ldots$

Series representations:

- More

$$\frac{1}{2}\left(192+33^2 \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647 5^{\cdot.} 590000 \times 1.68809\right)\right) = 96 - \frac{1089}{2} \sum_{k=1}^{\infty} \frac{(-1)^k (-0.965061)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\left(192+33^2 \log\left(\frac{1}{64} 1.32461750637559193447144431421271918762113384018555964 7^{\cdot.} 5590000 \times 1.68809\right)\right) = 96 + 1089\, i \pi \left\lfloor \frac{\arg(0.0349387 - x)}{2\pi} \right\rfloor + \frac{1089 \log(x)}{2} - \frac{1089}{2} \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$\frac{1}{2}\left(192+33^2 \log\left(\frac{1}{64} 1.324617506375591934471444314212719187621133840185559647 5^{\cdot.} 590000 \times 1.68809\right)\right) = 96 + \frac{1089}{2} \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \frac{1089 \log(z_0)}{2} + \frac{1089}{2} \left\lfloor \frac{\arg(0.0349387 - z_0)}{2\pi} \right\rfloor \log(z_0) - \frac{1089}{2} \sum_{k=1}^{\infty} \frac{(-1)^k (0.0349387 - z_0)^k z_0^{-k}}{k}$$

Open code

- Integral representation:

$$\frac{1}{2}\left(192+33^2 \log\left(\frac{1}{64}\right.\right.$$
$$1.3246175063755919344714443142127191876211338401855596475\dots$$
$$\left.\left.590000\times 1.68809\right)\right) = 96 + \frac{1089}{2}\int_1^{0.0349387}\frac{1}{t}\,dt$$

-

$-1730.3403611978473281397739214452655954195161786464 32$

Continued fraction:

- Linear form

$$-1730+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-15+\cfrac{1}{-6+\cfrac{1}{-1+\cfrac{1}{-35+\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-43+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{\dots}}}}}}}}}}}}}}$$

The result -1730,34 is practically in the range of the mass of the candidate "glueball" $f_0(1710)$ with minus sign.

We have the following interesting formula:

sqrt((((((1.93*10^88*2.03*10^88) * (((1/(6*10^54)))/(6*10^87)))*744*10^-3)))))))

Input interpretation:

$$\sqrt{\left((1.93\times 10^{88}\times 2.03\times 10^{88})\times \frac{\frac{1}{6\times 10^{54}}}{6\times 10^{87}}\right)\times 744\times 10^{-3}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$8.99832947459323326000840140122619485182329830808693 86\ldots\times 10^{16}$

89.983.294.745.932.332,6 ≈ 9 * 10^{16}

TABLE 1. The entropy of the universe including the Gibbons-Hawking entropy of the cosmic event horizon as well as the entropy of the dominant components contained within the cosmic event horizon. See Egan & Lineweaver (2009) for details.

Component	Entropy S [k]
Cosmic Event Horizon	$2.6 \pm 0.3 \times 10^{122}$
SMBHs	$1.2^{+1.1}_{-0.7} \times 10^{103}$
*Stellar BHs ($42 - 140\ M_{\odot}$)	$1.2 \times 10^{98^{+0.8}_{-1.6}}$
Stellar BHs ($2.5 - 15\ M_{\odot}$)	$2.2 \times 10^{96^{+0.6}_{-1.2}}$
Photons	$2.03 \pm 0.15 \times 10^{88}$
Relic Neutrinos	$1.93 \pm 0.15 \times 10^{88}$
Dark Matter	$6 \times 10^{86 \pm 1}$
Relic Gravitons	$2.3 \times 10^{86^{+0.2}_{-3.1}}$
ISM & IGM	$2.7 \pm 2.1 \times 10^{80}$
Stars	$3.5 \pm 1.7 \times 10^{78}$
Total	$\mathbf{2.6 \pm 0.3 \times 10^{122}}$

We have calculated the value of c^2 inserting in the above formula the following components: the Relic Neutrinos, the Photons, the inverse of Cosmological Constant $6 \times 10^{54}\ \mathrm{eV}^2$, the Dark Matter multiplied $744 * 10^{-3}$, where 744 is a coefficient of the well-known q-series of Monstrous Moonshine

$j = q^{-1} + 744 + 196884q + 21493760q^2 + ...$

If the universe is described by an effective local quantum field theory down to the Planck scale, then we would expect a cosmological constant of the order of M_{pl}^2 ($6 \times 10^{54}\ \mathrm{eV}^2$ in natural unit or 1 in reduced Planck unit)

Ramanujan Mock theta functions

From:

Mock Theta Function and... Youn-Seo Choi -School of Mathematics
Korea Institute for Advanced Study - Oct. 17. 2008

9

$\phi(q) = $ [illegible] (19)

$\psi(q) = $ [illegible]

$\chi(q) = 1 - \frac{q}{(1+q)(1+q^3)} + \frac{q^4}{(1+q)(1+q^2)(1+q^3)(1+q^5)} - \cdots$

$\chi(q) = \frac{1}{1+q} + \frac{q^4}{(1+q)(1+q^2)(1+q^3)} + \frac{q^8}{(1+q)(1+q^2)(1+q^3)} \cdots$ [illegible]

(1) [illegible]

(2) [illegible]

(3) [illegible]

(4) [illegible]

(5) [illegible]

(6) [illegible]

(7) $\int_0^\infty \frac{e^{-\pi n x^2}}{\cosh \frac{2\pi x}{\sqrt{5}}} dx$ [illegible]

(8) $\int_0^\infty \frac{e^{-\pi n x^2}}{\cosh \frac{2\pi x}{\sqrt{5}}} dx$ [illegible]

See below eqs. (7) and (8)

$$\int_0^\infty \frac{e^{-\pi n x^2}}{\cosh \frac{2\pi x}{\sqrt{5}} + \frac{1+\sqrt{5}}{4}} dx + \frac{1}{\sqrt{n}} e^{\frac{\pi}{5n}} \psi\left(-e^{-\frac{\pi}{n}}\right)$$

$$= \sqrt{\frac{5+\sqrt{5}}{2}} e^{-\frac{\pi n}{5}} \phi\left(-e^{-\pi n}\right) - \frac{\sqrt{5}+1}{2\sqrt{n}} e^{-\frac{\pi}{5n}} \phi\left(-e^{-\frac{\pi}{n}}\right)$$

and

$$\int_0^\infty \frac{e^{-\pi n x^2}}{\cosh \frac{2\pi x}{\sqrt{5}} + \frac{1-\sqrt{5}}{4}} dx + \frac{1}{\sqrt{n}} e^{\frac{\pi}{5n}} \psi\left(-e^{-\frac{\pi}{n}}\right)$$

$$= -\sqrt{\frac{5-\sqrt{5}}{2}} e^{\frac{\pi n}{5}} \psi\left(-e^{-\pi n}\right) + \frac{\sqrt{5}-1}{2\sqrt{n}} e^{-\frac{\pi}{5n}} \phi\left(-e^{-\frac{\pi}{n}}\right).$$

(Equations (7) and (8))

φ = 1.08094974; ψ = -1.08185 and for n = 0.5, we have:

((sqrt((5+sqrt(5))/2)) * e^-((0.5Pi)/5)) * (1.08094974)* (-e^(-0.5Pi)) - (((sqrt(5)+1)/(2(sqrt(0.5))) * e^(-Pi/2.5) * (1.08094974) * (-e^(-Pi/0.5))

Input interpretation:

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\, e^{-(0.5\pi)/5}\right) \times 1.08094974 \left(-e^{-0.5\pi}\right) - \frac{\sqrt{5}+1}{2\sqrt{0.5}} e^{-\pi/2.5} \times 1.08094974 \left(-e^{-\pi/0.5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

-0.31087322561542081575068142201814385596616647123405200398...

Series representations:

$$(1.08095(-e^{-0.5\pi}))\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\; e^{-1/5(0.5\pi)} - \frac{e^{-\pi/2.5}\left(\left(\sqrt{5}+1\right)1.08095\left(-e^{-\pi/0.5}\right)\right)}{2\sqrt{0.5}} =$$

$$-\left(\left(1.08095\, e^{-3\pi}\left(-0.5\, e^{0.6\pi} - 0.5\, e^{0.6\pi}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (5-z_0)^k z_0^{-k}}{k!} + e^{2.4\pi}\sqrt{z_0}^2 \sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_1!\,k_2!}(-1)^{k_1+k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2} (0.5-z_0)^{k_1}\left(\frac{1}{2}\left(5+\sqrt{5}\right)-z_0\right)^{k_2} z_0^{-k_1-k_2}\right)\right)\right) \Big/ \left(\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (0.5-z_0)^k z_0^{-k}}{k!}\right)$$

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

Enlarge Data Customize A Plaintext Interactive

$$(1.08095(-e^{-0.5\pi}))\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\; e^{-1/5(0.5\pi)} - \frac{e^{-\pi/2.5}\left(\left(\sqrt{5}+1\right)1.08095\left(-e^{-\pi/0.5}\right)\right)}{2\sqrt{0.5}} =$$

$$-\left(\left(1.08095\, e^{-3\pi}\left(-0.5\, e^{0.6\pi} - 0.5\, e^{0.6\pi}\exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!} + e^{2.4\pi}\exp\left(i\pi\left\lfloor\frac{\arg(0.5-x)}{2\pi}\right\rfloor\right)\exp\left(i\pi\left\lfloor\frac{\arg\left(-x+\frac{1}{2}\left(5+\sqrt{5}\right)\right)}{2\pi}\right\rfloor\right)\sqrt{x}^2\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_1!\,k_2!}(-1)^{k_1+k_2}(0.5-x)^{k_1} x^{-k_1-k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}\left(-x+\frac{1}{2}\left(5+\sqrt{5}\right)\right)^{k_2}\right)\right)\right) \Big/ \left(\exp\left(i\pi\left\lfloor\frac{\arg(0.5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k (0.5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$

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

$$(1.08095(-e^{-0.5\pi}))\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\, e^{-1/5(0.5\pi)} - \frac{e^{-\pi/2.5}\left(\left(\sqrt{5}+1\right)1.08095\left(-e^{-\pi/0.5}\right)\right)}{2\sqrt{0.5}} =$$

$$-\Bigg(\Bigg(1.08095\, e^{-3\pi}\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor} z_0^{-1-1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor}$$

$$\Bigg(-0.5\, e^{0.6\pi}\sqrt{z_0} - 0.5\, e^{0.6\pi}\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}$$

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

$$e^{2.4\pi}\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor+1/2\left\lfloor\arg\left(\frac{1}{2}\left(5+\sqrt{5}\right)-z_0\right)/(2\pi)\right\rfloor}$$

$$z_0^{3/2+1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor+1/2\left\lfloor\arg\left(\frac{1}{2}\left(5+\sqrt{5}\right)-z_0\right)/(2\pi)\right\rfloor}$$

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

$$\frac{(-1)^{k_1+k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}(0.5-z_0)^{k_1}\left(\frac{1}{2}\left(5+\sqrt{5}\right)-z_0\right)^{k_2} z_0^{-k_1-k_2}}{k_1!\,k_2!}$$

$$\Bigg)\Bigg)\Bigg/\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(0.5-z_0)^k z_0^{-k}}{k!}\right)\Bigg)$$

And

((-sqrt((5-sqrt(5))/2)) * e^((0.5Pi)/5)) *(-1.08185) (-e^(-0.5Pi)) + (((sqrt(5)-1)/(2(sqrt(0.5))) * e^(-Pi/2.5) * (1.08094974)* (-e^(-Pi/0.5))

Input interpretation:

$$\left(-\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\, e^{(0.5\pi)/5}\right)\times(-1.08185)\left(-e^{-0.5\pi}\right) + \frac{\sqrt{5}-1}{2\sqrt{0.5}}\, e^{-\pi/2.5}\times 1.08094974\left(-e^{-\pi/0.5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

$$-0.362465987148116964212065292353404532448726719860369561 45\ldots$$

Series representations:

$$(-1.08185(-e^{-0.5\pi}))\left(-\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\right)e^{(0.5\pi)/5}+\frac{\left(e^{-\pi/2.5}\left(\sqrt{5}-1\right)1.08095\right)(-1)e^{-\pi/0.5}}{2\sqrt{0.5}}=-\left(\left(1.08185\,e^{-2.8\pi}\left(-0.499584\,e^{0.4\pi}+0.499584\,e^{0.4\pi}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}+e^{2.4\pi}\sqrt{z_0}^{\,2}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_1!\,k_2!}(-1)^{k_1+k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}(0.5-z_0)^{k_1}\left(\frac{1}{2}\left(5-\sqrt{5}\right)-z_0\right)^{k_2}z_0^{-k_1-k_2}\right)\right)\Big/\left(\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(0.5-z_0)^k z_0^{-k}}{k!}\right)\right)$$

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

Enlarge Data Customize A Plaintext Interactive

$$(-1.08185(-e^{-0.5\pi}))\left(-\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\right)e^{(0.5\pi)/5}+\frac{\left(e^{-\pi/2.5}\left(\sqrt{5}-1\right)1.08095\right)(-1)e^{-\pi/0.5}}{2\sqrt{0.5}}=-\left(\left(1.08185\,e^{-2.8\pi}\left(-0.499584\,e^{0.4\pi}+0.499584\,e^{0.4\pi}\exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+e^{2.4\pi}\exp\left(i\pi\left\lfloor\frac{\arg(0.5-x)}{2\pi}\right\rfloor\right)\exp\left(i\pi\left\lfloor\frac{\arg\left(-x+\frac{1}{2}\left(5-\sqrt{5}\right)\right)}{2\pi}\right\rfloor\right)\sqrt{x}^{\,2}\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{1}{k_1!\,k_2!}(-1)^{k_1+k_2}(0.5-x)^{k_1}x^{-k_1-k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}\left(-x+\frac{1}{2}\left(5-\sqrt{5}\right)\right)^{k_2}\right)\right)\Big/\left(\exp\left(i\pi\left\lfloor\frac{\arg(0.5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(0.5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\right)$$

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

$$(-1.08185(-e^{-0.5\pi}))\left(-\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\right)e^{(0.5\pi)/5}+\frac{\left(e^{-\pi/2.5}\left(\sqrt{5}-1\right)1.08095\right)(-1)\,e^{-\pi/0.5}}{2\sqrt{0.5}}=$$

$$-\left(\left(1.08185\,e^{-2.8\pi}\left(\frac{1}{z_0}\right)^{-1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor}z_0^{-1-1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor}\right.\right.$$

$$\left(-0.499584\,e^{0.4\pi}\sqrt{z_0}+0.499584\,e^{0.4\pi}\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor}\right.$$

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

$$e^{2.4\pi}\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor+1/2\left\lfloor\arg\left(\frac{1}{2}\left(5-\sqrt{5}\right)-z_0\right)/(2\pi)\right\rfloor}$$

$$z_0^{3/2+1/2\lfloor\arg(0.5-z_0)/(2\pi)\rfloor+1/2\left\lfloor\arg\left(\frac{1}{2}\left(5-\sqrt{5}\right)-z_0\right)/(2\pi)\right\rfloor}$$

$$\sum_{k_1=0}^{\infty}\sum_{k_2=0}^{\infty}\frac{(-1)^{k_1+k_2}\left(-\frac{1}{2}\right)_{k_1}\left(-\frac{1}{2}\right)_{k_2}(0.5-z_0)^{k_1}\left(\frac{1}{2}\left(5-\sqrt{5}\right)-z_0\right)^{k_2}z_0^{-k_1-k_2}}{k_1!\,k_2!}$$

$$\left.\left.\left.\right)\right)\right)\Bigg/\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(0.5-z_0)^k z_0^{-k}}{k!}\right)$$

Note that:

Input interpretation:

−0.31087322561542081575068142201814385596616647123405 2 −
0.36246598714811696421206529235340453244872671986036 9

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

−0.67333921276353777996274671437154838841489319109442 1

Open code

-0.673339212763537779962746714371548388414893191094421

Note that -1-0.673339 = -1.673339 that as absolute value, is very near to the Hausdorff dimension 1,6667 = ln(32)/ln(8) and that 0,673339 is a good approximation to the Hausdorff dimension 0,6942 that is the Asymmetric Cantor set.

Continued fraction:

- Linear form

$$\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-16+\cfrac{1}{-3+\cfrac{1}{-7+\cfrac{1}{-4+\cfrac{1}{-3+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-5+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-5+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}$$

We have:

e * [((1 / -(-0.67333921276353777996274671437154838841489319109442 1)))]

Input interpretation:

$$e\left(-\frac{1}{-0.673339212763537779962746714371548388414893191094421}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.03701696994980631018541928627816563053920043314063...

Note that:

Input interpretation:

$$\sqrt[3]{4.0370169}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.5922827...

This result 1,5922827 is a good approximation to the Hausdorff dimension 1,5849 and the inverse:

Input interpretation:

$$\frac{1}{\sqrt[3]{4.0370169}}$$

Open code

Result:

- More digits

0.62802916...

Thence 0,62802916 is a good approximation to the Hausdorff dimension of Cantor set 0,6309...

Continued fraction:

- Linear form

$$4+\cfrac{1}{27+\cfrac{1}{68+\cfrac{1}{3+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{20+\cfrac{1}{3+\cfrac{1}{118+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{106+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{8+\cfrac{1}{28+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}$$

This result is 4,037 is in the range of the mass of hypothetical dark matter particles.

We have:

sqrt(13) ln((1/ -(-0.310873225615420815750681422018143855966166471234052))

Input interpretation:

$$\sqrt{13}\,\log\left(-\frac{1}{-0.310873225615420815750681422018143855966166471234052}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.21261824869160308863731338142036955875936560433069...

Series representations:

- More

$$\sqrt{13}\log\left(-\frac{1}{-0.31087322561542081575068142201814385596616647123405200000}\right) = \log(3.2167453405495052153713784324637631845250051552167634 64)\sqrt{12}\sum_{k=0}^{\infty}12^{-k}\binom{\frac{1}{2}}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt{13}\log\left(-\frac{1}{-0.31087322561542081575068142201814385596616647123405200000}\right) = \sqrt{12}\left(\log(2.2167453405495052153713784324637631845250051552167634 64) - \sum_{k=1}^{\infty}\frac{(-1)^k e^{-0.7960400573470481571424119438199956940198947491609884 36k}}{k}\right)\sum_{k=0}^{\infty}12^{-k}\binom{\frac{1}{2}}{k}$$

Open code

$$\sqrt{13}\log\left(-\frac{1}{-0.31087322561542081575068142201814385596616647123405200000}\right) = \sqrt{12}\left(\log(2.2167453405495052153713784324637631845250051552167634 64) - \sum_{k=1}^{\infty}\frac{(-1)^k e^{-0.7960400573470481571424119438199956940198947491609884 36k}}{k}\right)\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{12}\right)^k\left(-\frac{1}{2}\right)_k}{k!}$$

Integral representations:

$$\sqrt{13}\log\left(-\frac{1}{-0.31087322561542081575068142201814385596616647123405200000}\right) = \sqrt{13}\int_1^{3.2167453405495052153713784324637631845250051552167634 64}\frac{1}{t}\,dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt{13}\,\log\left(-\frac{1}{-0.3108732256154208157506814220181438559661664712340520000}\right) = \frac{\sqrt{13}}{2\,i\,\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-0.7960400573470481571424119438199956940198947491609884436\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

This result is 4,2126 is in the range of the mass of hypothetical dark matter particles.

Note that:

(((4.2126182))^1/3))

Input interpretation:

$\sqrt[3]{4.2126182}$

Open code

Result:

- More digits

1.6150428...

This result 1,6150428 is a good approximation to the Hausdorff dimension 1,61803 of golden dragon

sqrt(17) ln ((1/(-(-0.3624659871481169642120652923534045324487267198603 69)))

Input interpretation:

$\sqrt{17}\,\log\left(-\frac{1}{-0.362465987148116964212065292353404532448726719860369}\right)$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.1842291724956910231494634556277227730215903816 3279...

Series representations:

- More

$$\sqrt{17}\log\left(-\frac{1}{-0.3624659871481169642120652923534045324487267198603690000}\right)=\log(2.758879551342187415307606438400576615115288209959761472)\sqrt{16}\sum_{k=0}^{\infty}16^{-k}\binom{\frac{1}{2}}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt{17}\log\left(-\frac{1}{-0.3624659871481169642120652923534045324487267198603690000}\right)=\sqrt{16}\left(\log(1.758879551342187415307606438400576615115288209959761472)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-0.5646769877668477468569831574036992263888660376480111184\,k}}{k}\right)\sum_{k=0}^{\infty}16^{-k}\binom{\frac{1}{2}}{k}$$

Open code

$$\sqrt{17}\log\left(-\frac{1}{-0.3624659871481169642120652923534045324487267198603690000}\right)=\sqrt{16}\left(\log(1.758879551342187415307606438400576615115288209959761472)-\sum_{k=1}^{\infty}\frac{(-1)^k e^{-0.5646769877668477468569831574036992263888660376480111184\,k}}{k}\right)\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{16}\right)^k\left(-\frac{1}{2}\right)_k}{k!}$$

Integral representations:

$$\sqrt{17}\log\left(-\frac{1}{-0.3624659871481169642120652923534045324487267198603690000}\right)=\sqrt{17}\int_1^{2.758879551342187415307606438400576615115288209959761472}\frac{1}{t}\,dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt{17}\log\left(-\frac{1}{-0.362465987148116964212065292353404532448726719860369000 0}\right) = \frac{\sqrt{17}}{2 i \pi} \int_{-i\infty+\gamma}^{i\infty+\gamma} \frac{e^{-0.564676987766847746856983157403699226388660376480111184 s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

This result is 4,1842 is in the range of the mass of hypothetical dark matter particles.

Note that:

(((4.184229))^1/3))

Input interpretation:

$\sqrt[3]{4.184229}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.611407...

This result 1,611407 is a good approximation to the Hausdorff dimension 1,61803 of golden dragon

(4.21261824869160308863731338142036955875936560433069)^1/3

Input interpretation:

$\sqrt[3]{4.21261824869160308863731338142036955875936560433069}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.61504279600340171926075018400507186322824426760482...

Note that:

(1.61504279600340171926075018400507186322824426760482 * 10^3)+55

Input interpretation:

$1.61504279600340171926075018400507186322824426760482\times 10^3 + 55$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
1670.042796003401719260750184005071863228244267604822
Open code

Furthermore we have:

(1.61504279600340171926075018400507186322824426760482 * 10^3)+(27*4)

Input interpretation:
$1.61504279600340171926075018400507186322824426760482 \times 10^3 + 27 \times 4$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
1723.04279600340171926075018400507186322824426760482
(4.18422917249569102314946345562772277302159038163279)^1/3

Input interpretation:
$\sqrt[3]{4.18422917249569102314946345562772277302159038163279}$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

1.61140666031711163201746792557793237599163192097148...
Note that:

(1.61140666031711163201746792557793237599163192097148 * 10^3)+55

Input interpretation:
$1.61140666031711163201746792557793237599163192097148 \times 10^3 + 55$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
1666.40666031711163201746792557793237599163192097148
Open code

Furthermore we have:
(1.61140666031711163201746792557793237599163192097148 * 10^3)+(27*4)

Input interpretation:
$1.61140666031711163201746792557793237599163192097148 \times 10^3 + 27 \times 4$
Open code

Enlarge Data Customize A Plaintext Interactive

Result:

1719.4066603171116320174679255779323759916319 2097148

The results 1723,0427 and 1719,406 are in the range of the mass of f_0(1710) candidate glueball

The results 1670,042 and 1666,406 are very near to the rest mass of Omega baryon.

Now:

Pi*0.67333921276 ln ((1.6114066603171116320174679255779323759916319 2097148 * 10^3) * (1.6150427960034017192607501840050718632282442676 0482 * 10^3))

Input interpretation:

$$\pi \times 0.67333921276 \log((1.61140666031711163201746792557793237599163192097148 \times 10^3) (1.61504279600340171926075018400507186322824426760482 \times 10^3))$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

31.248018010...

Series representations:

- More

$$\pi\, 0.673339212760000 \log((1.615042796003401719260750184005071863228244267604820000 \times 10^3)\, 1.611406660317111632017467925577932375991631920971480000 \times 10^3) = 0.673339212760000\,\pi \log(2.602489718177051769890916367214143839978082841352207266 \times 10^6) - 0.673339212760000\,\pi \sum_{k=1}^{\infty} \frac{(-1)^k e^{-14.77197912871496561891031327855584037716230890470279935 3 k}}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi\, 0.673339212760000 \log\left(\left(1.615042796003401719260750184005071863228244267604820000 \times 10^3\right) 1.611406660317111632017467925577932375991631920971480000 \times 10^3\right) = 1.34667842552000\, i\, \pi^2 \left\lfloor \frac{1}{2\pi} \arg\left(2.602490718177051769890916367214143839978082841352207266 \times 10^6 - x\right) \right\rfloor + 0.673339212760000\, \pi \log(x) - 0.673339212760000\, \pi \sum_{k=1}^{\infty} \frac{1}{k} (-1)^k \left(2.602490718177051769890916367214143839978082841352207266 \times 10^6 - x\right)^k x^{-k} \quad \text{for } x < 0$$

Open code

$$\pi\, 0.673339212760000 \log\left(\left(1.615042796003401719260750184005071863228244267604820000 \times 10^3\right) 1.611406660317111632017467925577932375991631920971480000 \times 10^3\right) = 1.34667842552000\, i\, \pi^2 \left\lfloor -\frac{1}{2\pi} \left(-\pi + \arg\left(2.60249071817705176989091636721414383997808284135220726\ldots66 \times 10^6 / z_0\right) + \arg(z_0)\right) \right\rfloor + 0.673339212760000\, \pi \log(z_0) - 0.673339212760000\, \pi \sum_{k=1}^{\infty} \frac{1}{k} (-1)^k \left(2.602490718177051769890916367214143839978082841352207266 \times 10^6 - z_0\right)^k z_0^{-k}$$

Integral representations:

$$\pi\, 0.673339212760000 \log\left(\left(1.615042796003401719260750184005071863228244267604820000 \times 10^3\right) 1.611406660317111632017467925577932375991631920971480000 \times 10^3\right) = 0.673339212760000\, \pi \int_1^{2.602490718177051769890916367214143839978082841352207266 \times 10^6} \frac{1}{t}\, dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\pi\, 0.673339212760000 \log\left((1.6150427960034017192607501840050718632282442676048200000 \times 10^3)\; 1.6114066603171116320174679255779323759916319209714800000 \times 10^3\right) = \frac{0.336669606380000}{i} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-14.771979128714965618910313278555840377162308904702799353\, s}\, \Gamma(-s)^2\, \Gamma(1+s)}{\Gamma(1-s)}\, ds \quad \text{for } -1 < \gamma < 0$$

This result 31,248 is very near to the value of black hole entropy 31,346

Now:

((((54* ln ((1.61140666031711163201746792557793237599163192097148 * 10^3) * (1.61504279600340171926075018400507186322824426760482 * 10^3))))-16

Input interpretation:

$$54 \log\left((1.61140666031711163201746792557793237599163192097148 \times 10^3)(1.61504279600340171926075018400507186322824426760482 \times 10^3)\right) - 16$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

781.6868936999656713912981415000634157712595841186551...

Series representations:

- More

$$54 \log\left((1.6150427960034017192607501840050718632282442676048200000 \times 10^3)\; 1.6114066603171116320174679255779323759916319209714800000 \times 10^3\right) - 16 = -16 + 54 \log\left(2.602489718177051769890916367214143839978082841352207266 \times 10^6\right) - 54 \sum_{k=1}^{\infty} \frac{(-1)^k\, e^{-14.771979128714965618910313278555840377162308904702799353\, k}}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$54 \log((1.615042796003401719260750184005071863228244267604820000 \times 10^3) 1.611406660317111632017467925577932375991631920971480000 \times 10^3) - 16 = -16 + 108 i \pi \left\lfloor \frac{1}{2\pi} \arg(2.602490718177051769890916367214143839978082841352207266 \times 10^6 - x) \right\rfloor + 54 \log(x) - 54 \sum_{k=1}^{\infty} \frac{1}{k} (-1)^k (2.602490718177051769890916367214143839978082841352207266 \times 10^6 - x)^k x^{-k} \quad \text{for } x < 0$$

Open code

$$54 \log((1.615042796003401719260750184005071863228244267604820000 \times 10^3) 1.611406660317111632017467925577932375991631920971480000 \times 10^3) - 16 = -16 + 54 \left\lfloor \frac{1}{2\pi} \arg(2.602490718177051769890916367214143839978082841352207266 \times 10^6 - z_0) \right\rfloor \log\left(\frac{1}{z_0}\right) + 54 \log(z_0) + 54 \left\lfloor \frac{1}{2\pi} \arg(2.602490718177051769890916367214143839978082841352207266 \times 10^6 - z_0) \right\rfloor \log(z_0) - 54 \sum_{k=1}^{\infty} \frac{1}{k} (-1)^k (2.602490718177051769890916367214143839978082841352207266 \times 10^6 - z_0)^k z_0^{-k}$$

Integral representations:

$$54 \log((1.615042796003401719260750184005071863228244267604820000 \times 10^3) 1.611406660317111632017467925577932375991631920971480000 \times 10^3) - 16 = -16 + 54 \int_1^{2.602490718177051769890916367214143839978082841352207266 \times 10^6} \frac{1}{t} \, dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$54 \log((1.615042796003401719260750184005071863228244267604820000 \times 10^3) 1.611406660317111632017467925577932375991631920971480000 \times 10^3) - 16 = -16 + \frac{27}{i \pi} \int_{-i \infty + \gamma}^{i \infty + \gamma} \frac{e^{-14.77197912871496561891031327855584037716230890470279935 s} \, \Gamma(-s)^2 \, \Gamma(1+s)}{\Gamma(1-s)} \, ds \quad \text{for } -1 < \gamma < 0$$

This result 781,68 is very near to the rest mass of Omega meson 782,65

Add. Ms. a 94 (5) (35)

$$F(q) = 1 + \frac{q}{1 - 2q\cos\frac{2n\pi}{5} + q^2}$$

$$+ \frac{q^4}{(1-2q\cos\frac{2n\pi}{5}+q^2)(1-2q^2\cos\frac{2n\pi}{5}+q^4)}$$

$$+ \cdots \qquad n = 1, 2.$$

$$\phi(q) = \frac{1}{1-q} + \frac{q^5}{(1-q)(1-q^4)(1-q^6)}$$

$$+ \frac{q^{20}}{(1-q)(1-q^4)(1-q^6)(1-q^9)(1-q^{11})} + \cdots$$

$$\psi(q) = \frac{1}{1-q^2} + \frac{q^5}{(1-q^2)(1-q^3)(1-q^7)}$$

$$+ \frac{q^{20}}{(1-q^2)(1-q^3)(1-q^7)(1-q^8)(1-q^{12})} + \cdots$$

$$F(q^{\frac{1}{5}}) = \frac{1-q^2-q^3+\cdots}{(1-q)^2(1-q^4)^2(1-q^6)^2\cdots} - 4\sin^2\frac{n\pi}{5}\{\phi(q)-1\}$$

$$+ q^{\frac{1}{5}}\cdot\frac{(1-q^5)(1-q^{10})(1-q^{15})\cdots}{(1-q)(1-q^4)(1-q^6)\cdots}$$

$$+ 2q^{\frac{2}{5}}\cos\frac{2n\pi}{5}\cdot\frac{(1-q^5)(1-q^{10})(1-q^{15})}{(1-q^2)(1-q^3)(1-q^7)\cdots}$$

$$+ q^{\frac{3}{5}}\left\{2\cos\frac{2n\pi}{5}\left\{\frac{(1-\cdots q^5+q^7+\cdots)}{(1-q^2)^2(1-q^3)^2(1-q^7)^2} + 4\sin^2\frac{2n\pi}{5}\right.\right.$$

$$\frac{1}{q}\{\psi(q^5)-1\} + \frac{1}{(1-q)(1-q^4)(1-q^6)\cdots} \quad \frac{\{(1-q^5)(1-q^{10})\}^2}{(1-q^{15})(1-q^{20})} -$$

$$= \frac{1}{1-q} + \frac{q^{15}}{(1-q)(1-q^{14})(1-q^{16})} + \cdots + \frac{q^4}{1-q^4} + \frac{q^{11}}{(1-q^5)(1-q^{11})}$$

$$\phi(q^5)-1 + \frac{1}{1-q^2} + \cdots \quad - \frac{1}{q^2}\left(\frac{q^7}{1-q^7} \cdots\right)$$

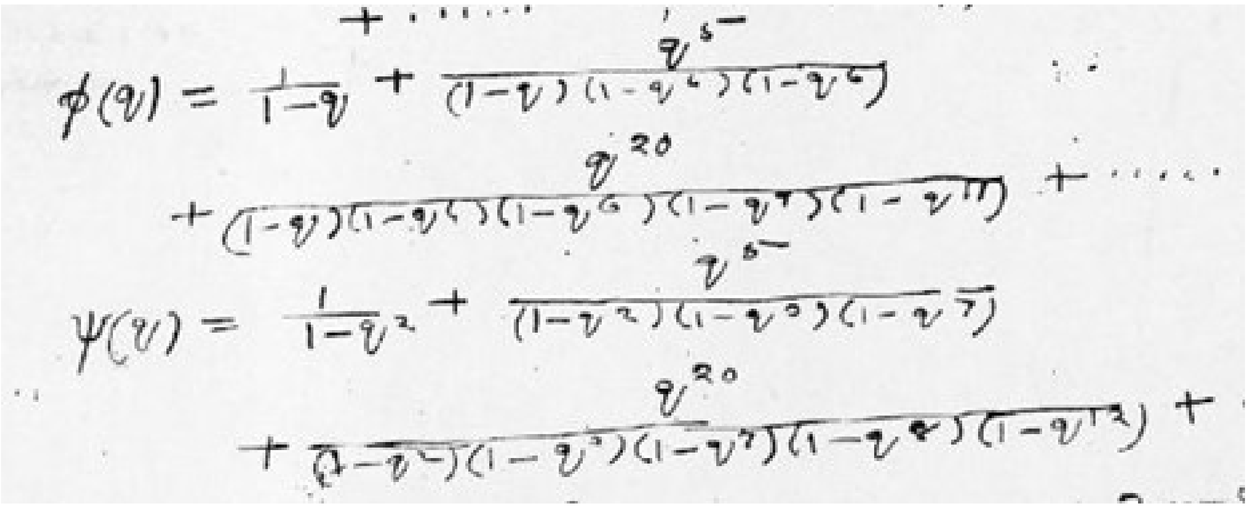
$$= \frac{1}{(1-q^2)(1-q^3)\cdots} \quad \frac{(1-q^5)(1-q^{10})}{(1-q^{15})(1-q^{20})}$$

~~$a_7 + a_5 + a_1 + a_1 + \cdots + a_1(a_2+1) + a_2+1$~~

$$3a_2 + 2a_1 + 2a_3 + a_1 \qquad a_2$$

$$+ a_2 + d \qquad 2 - 2\cos\frac{4\pi}{5}$$

Now, we have:



$$\phi(q) = \frac{1}{1-q} + \frac{q^5}{(1-q)(1-q^4)(1-q^6)} + \frac{q^{20}}{(1-q)(1-q^4)(1-q^6)(1-q^9)(1-q^{11})} + \cdots$$

$$\psi(q) = \frac{1}{1-q^2} + \frac{q^6}{(1-q^2)(1-q^3)(1-q^7)} + \frac{q^{20}}{(1-q^2)(1-q^3)(1-q^7)(1-q^8)(1-q^{12})} + \cdots$$

Now, we have calculated new values for φ and ψ. We have obtained φ = -0.0818492; ψ = -0.005756894276. If we take n = 16, we have, from the eqs. (7) and (8):

((-sqrt((5-sqrt(5))/2)) * e^((16Pi)/5)) *(-0.005756894276) (-e^(-16Pi)) + (((sqrt(5)-1)/(2(sqrt(16))) * e^(-Pi/80) * (-0.0818492)* (-e^(-Pi/16))

Input interpretation:

$$\left(-\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\, e^{(16\pi)/5}\right)\times(-0.005756894276)\left(-e^{-16\pi}\right) + \frac{\sqrt{5}-1}{2\sqrt{16}}\, e^{-\pi/80}\times(-0.0818492)\left(-e^{-\pi/16}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.00999168...

((sqrt((5+sqrt(5))/2)) * e^-((16Pi)/5)) * (-0.0818492)* (-e^(-16Pi)) - (((sqrt(5)+1)/(2(sqrt(16))) * e^(-Pi/80) * (-0.0818492) * (-e^(-Pi/16))

Input interpretation:

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\, e^{-(16\pi)/5}\right)\times(-0.0818492)\left(-e^{-16\pi}\right) - \frac{\sqrt{5}+1}{2\sqrt{16}}\, e^{-\pi/80}\times(-0.0818492)\left(-e^{-\pi/16}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits
  $-0.0261586\ldots$

We have that:

12* 1/(-0.0261586+0.00999168)

Input interpretation:

$$12\times\frac{1}{-0.0261586+0.00999168}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits
  $-742.25641000264738119567610899293124478874145477307984452 2\ldots$

And

28* 1/(-0.0261586+0.00999168)

Input interpretation:

$$28\times\frac{1}{-0.0261586+0.00999168}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits
  $-1731.93162333951055612324425431683957117373006113718630388\ldots$

Where -742,2564 and -1731,93162 are results very near to the values of rest mass of the Charged rho meson 775,4 and to the range of the mass of $f_0(1710)$ candidate glueball (with minus sign).

1/((3*5*(-0.0261586+0.00999168)))

Input interpretation:

$$\frac{1}{3\times5\,(-0.0261586+0.00999168)}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits

$-4.12364672223692989553153393884961802660411919318377691401...$

Open code

(((4.1236467))^1/3))

Input interpretation:

$$\sqrt[3]{4.1236467}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.6035918...$

This result is about the mean of two Hausdorff dimensions: 1,5849 and 1,61803 (1,601465)

This result, -4,123646 is in the range of the mass of hypothetical dark matter particles, with minus sign.

Now, if we take n = 0.5 , we have, from the eqs. (7) and (8):

((-sqrt((5-sqrt(5))/2)) * e^((0.5Pi)/5)) *(-0.005756894276) (-e^(-0.5Pi)) + (((sqrt(5)-1)/(2(sqrt(0.5))) * e^(-Pi/2.5) * (-0.0818492)* (-e^(-Pi/0.5))

Input interpretation:

$$\left(-\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\, e^{(0.5\,\pi)/5}\right)\times(-0.005756894276)\left(-e^{-0.5\,\pi}\right)+\frac{\sqrt{5}-1}{2\sqrt{0.5}}\, e^{-\pi/2.5}\times(-0.0818492)\left(-e^{-\pi/0.5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-0.00188811...$

((sqrt((5+sqrt(5))/2)) * e^-((0.5Pi)/5)) * (-0.0818492)* (-e^(-0.5Pi)) - (((sqrt(5)+1)/(2(sqrt(0.5))) * e^(-Pi/2.5) * (-0.0818492) * (-e^(-Pi/0.5))

Input interpretation:

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\, e^{-(0.5\,\pi)/5}\right)\times(-0.0818492)\left(-e^{-0.5\,\pi}\right)-\frac{\sqrt{5}+1}{2\sqrt{0.5}}\, e^{-\pi/2.5}\times(-0.0818492)\left(-e^{-\pi/0.5}\right)$$

Open code

Result:

- More digits

0.0235392...

Now, we have:

38 * 1/(0.0235392-0.00188811) – 27

Input interpretation:

$$38\times\frac{1}{0.0235392-0.00188811}-27$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1728.107941447751591259377703385834154308166471064505297423...

Continued fraction:

- Linear form

$$1728+\cfrac{1}{9+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{40+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}$$

This result 1728,1079 is in the range of the mass of $f_0(1710)$ candidate glueball.

-0.61803398 + ln (-(-0.0235392-0.00188811)))

Input interpretation:

$-0.61803398+\log(-(-0.0235392-0.00188811))$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

-4.289965...

Note that:

(((4.289965))^1/3))

Input interpretation:

$$\sqrt[3]{4.289965}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.624867...

This result is very near to the value of the Hausdorff dimension 1,6309

Continued fraction:

- Linear form

$$-4+\cfrac{1}{-3+\cfrac{1}{-2+\cfrac{1}{-4+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-2+\cfrac{1}{-4+\cfrac{1}{-1+\cfrac{1}{-6+\cfrac{1}{-3+\cfrac{1}{-1+\cfrac{1}{-108+\cfrac{1}{-3+\cfrac{1}{-5+\cfrac{1}{-1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}$$

This result -4,289965 is very near to the range of the mass of hypothetical dark matter particles, with minus sign.

8 ln ((0.0235392-0.00188811)))

Input interpretation:

$$8 \log(0.0235392 - 0.00188811)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

-30.66160...

Series representations:

- More

$$8 \log(0.0235392 - 0.00188811) = -8 \sum_{k=1}^{\infty} \frac{(-1)^k (-0.978349)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$8 \log(0.0235392 - 0.00188811) = 16 i \pi \left\lfloor \frac{\arg(0.0216511 - x)}{2\pi} \right\rfloor + 8 \log(x) - 8 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0216511 - x)^k x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$8 \log(0.0235392 - 0.00188811) = 8 \left\lfloor \frac{\arg(0.0216511 - z_0)}{2\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + 8 \log(z_0) + 8 \left\lfloor \frac{\arg(0.0216511 - z_0)}{2\pi} \right\rfloor \log(z_0) - 8 \sum_{k=1}^{\infty} \frac{(-1)^k (0.0216511 - z_0)^k z_0^{-k}}{k}$$

Integral representation:

$$8 \log(0.0235392 - 0.00188811) = 8 \int_1^{0.0216511} \frac{1}{t} \, dt$$

This result -30,66160 is very near to the value of the black hole entropy 30,5963 wit minus sign.

64*7* ln ((0.0235392-0.00188811)))

Input interpretation:

$$64 \times 7 \log(0.0235392 - 0.00188811)$$

Open code

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

Result:

- More digits

$-1717.049\ldots$

Continued fraction:

- Linear form

$$-1717 + \cfrac{1}{-20 + \cfrac{1}{-3 + \cfrac{1}{-1 + \cfrac{1}{-8 + \cfrac{1}{-1 + \cfrac{1}{-4 + \cfrac{1}{-60 + \cfrac{1}{-1 + \cfrac{1}{-3 + \cfrac{1}{-3 + \cfrac{1}{-7 + \cfrac{1}{-9 + \cfrac{1}{-2 + \cfrac{1}{-3 + \cfrac{1}{\ldots}}}}}}}}}}}}}}}$$

This result -1717,049 is in the range of the mass of $f_0(1710)$ candidate glueball, with minus sign.
2Pi* ((32 ln ((0.0235392-0.00188811)))

Input interpretation:

$2\pi\,(32\log(0.0235392 - 0.00188811))$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-770.6100\ldots$

Continued fraction:

- Linear form

$$-770+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-2+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-3+\cfrac{1}{-16+\cfrac{1}{-1+\cfrac{1}{-7+\cfrac{1}{-1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}$$

Series representations:

- More

$$(2\pi)\,32\log(0.0235392 - 0.00188811) = -64\pi\sum_{k=1}^{\infty}\frac{(-1)^k\,(-0.978349)^k}{k}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$(2\pi)\,32\log(0.0235392 - 0.00188811) = 128\,i\,\pi^2\left\lfloor\frac{\arg(0.0216511 - x)}{2\pi}\right\rfloor + 64\pi\log(x) - 64\pi\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.0216511 - x)^k\,x^{-k}}{k} \quad \text{for } x < 0$$

Open code

$$(2\pi)\,32\log(0.0235392-0.00188811)=128\,i\,\pi^2\left\lfloor -\frac{-\pi+\arg\left(\frac{0.0216511}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor+$$
$$64\,\pi\log(z_0)-64\,\pi\sum_{k=1}^{\infty}\frac{(-1)^k\,(0.0216511-z_0)^k\,z_0^{-k}}{k}$$

Integral representation:

$$(2\pi)\,32\log(0.0235392-0.00188811)=64\,\pi\int_1^{0.0216511}\frac{1}{t}\,dt$$

This result -770,61 is very near to the values of rest mass of the Charged rho meson 775,4.

With regard the new values of φ and ψ, i.e. φ = -0.0818492; ψ = -0.005756894276. If we take:

1/((sqrt(-ln(0.0818492)))

Input interpretation:

$$\frac{1}{\sqrt{-\log(0.0818492)}}$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

0.6320919625851998756510477625250617009857978609566640923 17...

Series representations:

- More

$$\frac{1}{\sqrt{-\log(0.0818492)}}=\frac{1}{\sqrt{\sum_{k=1}^{\infty}\frac{(-1)^k\,(-0.918151)^k}{k}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{\sqrt{-\log(0.0818492)}}=\frac{1}{\sqrt{-1-\log(0.0818492)}\,\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}(-1-\log(0.0818492))^{-k}}$$

Open code

$$\frac{1}{\sqrt{-\log(0.0818492)}} = \frac{1}{\sqrt{-1-\log(0.0818492)}\ \sum_{k=0}^{\infty} \frac{(-1)^k (-1-\log(0.0818492))^{-k} \left(-\frac{1}{2}\right)_k}{k!}}$$

Open code

Integral representation:

$$\frac{1}{\sqrt{-\log(0.0818492)}} = \frac{1}{\sqrt{-\int_1^{0.0818492} \frac{1}{t}\,dt}}$$

and

1/((sqrt-(ln(0.0818492-0.005756894276)))

Input interpretation:

$$\frac{1}{\sqrt{-\log(0.0818492 - 0.005756894276)}}$$

Open code

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

Result:

- Fewer digits
- More digits

0.623079188304950556144309691883832486635176228840268800996...

Series representations:

- More

$$\frac{1}{\sqrt{-\log(0.0818492 - 0.00575689)}} = \frac{1}{\sqrt{\sum_{k=1}^{\infty} \frac{(-1)^k (-0.923908)^k}{k}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{\sqrt{-\log(0.0818492 - 0.00575689)}} = \frac{1}{\sqrt{-1-\log(0.0760923)}\ \sum_{k=0}^{\infty} \binom{\frac{1}{2}}{k} (-1-\log(0.0760923))^{-k}}$$

Open code

$$\frac{1}{\sqrt{-\log(0.0818492 - 0.00575689)}} = \frac{1}{\sqrt{-1-\log(0.0760923)}\ \sum_{k=0}^{\infty} \frac{(-1)^k (-1-\log(0.0760923))^{-k} \left(-\frac{1}{2}\right)_k}{k!}}$$

Integral representation:

$$\frac{1}{\sqrt{-\log(0.0818492 - 0.00575689)}} = \frac{1}{\sqrt{-\int_1^{0.0760923} \frac{1}{t}\,dt}}$$

We obtain two results: 0,6320919 and 0,62307918 both a good approximation of the value of Hausdorff dimension of Cantor set: ≈ 0,6309 =

ln(2)/ln(3) = 0,63092975357145.....

We remember that: the Cantor set is uncountable. An **uncountable set** (or **uncountably infinite set**) is an infinite set that contains too many elements to be countable

Now, from:

SOME INTEGRALS OF THETA FUNCTIONS IN RAMANUJAN'S LOST NOTEBOOK

SEUNG HWAN SON

Dedicated to Bruce C. Berndt

Theorem 3.2. *For* $0 < q < 1$,

$$q^{1/4}\frac{\psi(\ q^3)}{\psi(-q)} = \exp\left(\frac{1}{4}\int \varphi^2(q)\varphi^2(q^3)\,\frac{dq}{q}\right).$$

Ramanujan expressed Theorem 3.2 in terms of an indefinite integral, because both sides tend to ∞ as q tends to $1-$. To see this, we apply (2.5) to find that

$$\frac{\psi(-q^3)}{\psi(-q)} = \frac{f(-q^3,-q^9)}{f(-q,-q^3)} \sim \sqrt{\frac{1}{3}}\exp\left(-\frac{\pi^2}{12\log q}\right) \to \infty.$$

We have three cases:

((([(sqrt(1/3))* exp [-(Pi^2)/(12ln(-e^-0.5)*(-21.79216)])))

Input interpretation:

$$\sqrt{\frac{1}{3}} \exp\left(-\frac{\pi^2}{12 \log\left(-\frac{1}{e^{0.5}}\right) \times (-21.79216)}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.57623509... −
0.0067518710... i

And

7 * (0.57623509-0.0067518710 i^2)

Input interpretation:

$$7\,(0.57623509 + i^2 \times (-0.0067518710))$$

Open code

- i is the imaginary unit

Result:

4.080908727

This result is very near to the range of the mass of hypothetical dark matter particles.

Note that:

Input interpretation:

$$\frac{1}{\sqrt[3]{4.080908727}}$$

Open code

Result:

- More digits

0.6257694726...

This result is very near to the value of Hausdorff dimension 0,6309

((([(sqrt(1/3))* exp [-(Pi^2)/(12ln(-e^-0.5)*(0.61803398)])))

Input interpretation:

$$\sqrt{\frac{1}{3}} \exp\left(-\frac{\pi^2}{12 \log\left(-\frac{1}{e^{0.5}}\right) \times 0.61803398}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.5647126... +
0.2475497... i

And

sqrt(1.61803398)* 1/(0.5647126 +0.2475497 i^2)

Input interpretation:

$$\sqrt{1.61803398} \times \frac{1}{0.5647126 + 0.2475497 i^2}$$

Open code

- i is the imaginary unit

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.010619...

This result is very near to the range of the mass of hypothetical dark matter particles.

And

Input interpretation:

$$\frac{1}{\sqrt[3]{4.010619}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.6294040...

This result is very near to the value of Hausdorff dimension 0,6309

((([(sqrt(1/3))* exp [-(Pi^2)/(12ln(-e^-1.61803398)])))

Input interpretation:

$$\sqrt{\frac{1}{3}} \exp\left(-\frac{\pi^2}{12 \log\left(-\frac{1}{e^{1.61803398}}\right)}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.628575316... +
0.131948930... i

And

(((2.06))) * 1/(0.628575316 +0.131948930 i^2)

where 2.06 is a Hausdorff dimension

Input interpretation:

$$2.06 \times \frac{1}{0.628575316 + 0.131948930\, i^2}$$

Open code

- i is the imaginary unit

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.147987416842567845358099841275851984231864796648158762953...

This result is very near to the range of the mass of hypothetical dark matter particles.

Input interpretation:

$$\sqrt[3]{4.147987416842567845358099841275851984231864796648158762953}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.606740756397494603979558161822044515749140386587878188313...

This result is very near to the value of Hausdorff dimension of golden dragon 1,61803.

From:

Asymmetric Dark Matter: Theories, Signatures, and Constraints
Kathryn M. Zurek - arXiv:1308.0338v2

Now, we have:

The connection between the DM and baryon densities arises naturally when the DM has an asymmetry in the number density of matter over anti-matter similar to baryons.[1] The DM density is then set by its asymmetry, which can be directly connected to the baryon asymmetry, rather than by its annihilation cross-section. Thus we have

$$n_X - n_{\bar{X}} \sim n_b - n_{\bar{b}}, \qquad (2)$$

where n_X, $n_{\bar{X}}$ are the DM and anti-DM number densities, and n_b, $n_{\bar{b}}$ are the baryon and anti-baryon asymmetries. The asymmetry is approximately one part in 10^{10} in comparison

to the thermal abundance, since

$$\eta \equiv \frac{n_B}{n_\gamma} = \frac{n_b - n_{\bar{b}}}{n_\gamma} \approx 6 \times 10^{-10}, \qquad (3)$$

with the last relation being obtained most precisely from Cosmic Microwave Background (CMB) data [7]. Since $\rho_{DM}/\rho_B \sim 5$, the relation of Eq. 2 suggests $m_X \sim 5m_p \simeq 5$ GeV.

This natural relationship is broken in two instances. First, if DM-number violating process creating the DM asymmetry decouples (at a temperature T_D) after the DM becomes non-relativistic, in which case there is a Boltzmann suppression in the asymmetry which scales as e^{-m_X/T_D}, where m_X is the DM mass.

We have $m_X \approx 5$ GeV = 4.5 * 10^{17} GeV (energy)

The number density of DM in the universe today scales inversely with the mass of the DM particle. Because of the high number density and consequently high annihilation rate of light DM (DM with mass $m_X \lesssim 10$ GeV), the CMB can be sensitive to light DM annihilation. The ionizing radiation from DM annihilation can distort the CMB spectrum, so that observations place a constraint on the DM annihilation.

We have $m_X \approx 10$ GeV = 9 * 10^{17} GeV (energy)

From the following Mock Theta function (5th order), we have obtained that

ψ(q) = (32844.3)+(1.33208 × 10^10)+(9.39267 × 10^17) =

= 9.392670133208328443 × 10^{17}

We note that the value of the function is practically equal to the energy of m_X = 9 * 10^{17} GeV (energy) and that:

Input interpretation:

$\frac{1}{2} \times 9.392670133208328443 \times 10^{17}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$4.696335066604164221 5 \times 10^{17}$

Open code

where 4,696 * 10^{17} is a good approximation to the value 4.5 * 10^{17} GeV (energy).

We note that: (4.696*10^17)^1/8

$\sqrt[8]{4.696 \times 10^{17}}$

$1.617953407616211113 \times 10^{2}$

Result:

161.7953407616211113

and this value 1,6179534 * 10^{2} is practically a multiple of the Hausdorff dimension of golden dragon 1,61803

Collapse to Black Hole: In order for the black hole to continue to grow to consume the neutron star, the accretion rate must exceed the Hawking evaporation rate. The Bondi Hoyle accretion rate is $\pi(GM_{BH}/v_s^2)^2\rho_B v_s$, with the sound speed $v_s \sim 10^5$ km/s where ρ_B the baryon energy density. The Hawking evaporation rate is $1/(15360\pi G^2 M_{BH}^2)$. Balancing these against each other, the critical black hole mass where the black hole will continue to grow is $M_{BH}^{crit} \simeq 1.2 \times 10^{37}$ GeV.

We have $M_{BH}^{crit} \approx$ 1,2 * 10^{37} GeV = 1.08 * 10^{54} GeV (energy)

We note immediately, that the value of mass 1,2 * 10^{37} GeV is a multiple practically equal to the Hausdorff dimension of Fibonacci word fractal 60° that is 1,2083 =

$$3\frac{\log(\varphi)}{\log\left(\frac{3+\sqrt{13}}{2}\right)}$$

While with regard the value of the energy 1.08 * 10^{54} GeV is a multiple practically equal to the Hausdorff dimension 1.0812

Note that $M_{BH}^{crit} \approx$ 1,2 * 10^{37} GeV can be obtained by the following multiplication of three results of Mock theta function previously calculated:

Input interpretation:

$(3.07735 \times 10^{13})(1.63161 \times 10^{20}) \times 2498.279$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

12543946382457346500000000000000000000

Scientific notation:

$1.2543946382457346 5 \times 10^{37}$

The result 1.254 * 10^{37} is indeed equal to the $M_{BH}^{crit} \approx$ 1,2 * 10^{37} GeV

Furthermore: (1.254 * 1/2) * 10^{37} = 0,627 * 10^{37} that is a multiple very near to the Hausdorff dimension of Cantor set 0.6309

In the standard WIMP paradigm, DM carries little or no self-interactions. On the other hand, with the introduction of light dark forces, for example to annihilate the thermal relic abundance, as in Sec. IV, or to set the mass scale in the DM sector, as we just described above, self-interactions appear naturally. The scattering cross-section through a force ϕ with dark structure constant α_X coupling to the DM is

$$\sigma_X \approx 5 \times 10^{-23}\ \mathrm{cm}^2 \left(\frac{\alpha_X}{0.01}\right)^2 \left(\frac{m_X}{10\ \mathrm{GeV}}\right)^2 \left(\frac{10\ \mathrm{MeV}}{m_\phi}\right)^4, \tag{56}$$

so that self-scattering can be important even for moderate self-coupling.

The scattering cross-section is $\sigma_X \approx 5 * 10^{-23}$

The ADM mechanism itself, through the operators Eq. 15, need not provide a direct detection (DD) signal, though in some cases, depending on the UV completion, it will. For example, the operator $Xu^c d^c d^c$ has, as one possible UV completion, interactions of the form $\lambda_X X u^c U + \lambda_U U^c d^c d^c + m_U U U^c$. The heavy particle U may mediate t-channel scattering off of nucleons, though the scattering cross-section is generically very small, even if the state is near the weak scale [9]:

$$\sigma_{n,X} \simeq \frac{\lambda_X^4 \mu_n^2}{\pi m_U^4} \frac{\left[\frac{2}{3} Z^2 + \frac{1}{3}(A-Z)^2\right]}{[Z^2 + (A-Z)^2]}$$
$$\simeq 5 \times 10^{-45}\ \mathrm{cm}^2 \left(\frac{\lambda_X^2/m_U}{100\ \mathrm{TeV}}\right)^2 \left(\frac{1\ \mathrm{TeV}}{m_U}\right)^2, \qquad (74)$$

where μ_n is the DM-nucleon reduced mass, we have taken $A = 28,\ Z = 14,\ m_X = 10$ GeV, and we have inserted meson oscillation constraints on λ^2/m_U of around 100 TeV.

The scattering cross-section off of nucleons, i.e. the particles component of atomic nucleus (protons or neutrons) is $\sigma_{n,X} \approx 5 * 10^{-45}$

$\epsilon F'_{\mu\nu} F^{\mu\nu}$. This mixing both sets the mass scale of the DM, as in Sec. V, and provides a connection to the visible sector for direct detection. The scattering cross-section via kinetic mixing off the proton is

$$\sigma_{p,X} = \frac{4}{\pi} \frac{g_Y^2 g_X^2 c_W^4 \epsilon^2 \mu_n^2}{m_{\gamma_d}^4} \qquad (75)$$
$$\simeq 4 \times 10^{-41}\ \mathrm{cm}^2 \left(\frac{g_X}{0.1}\right)^2 \left(\frac{\epsilon}{10^{-3}}\right)^2 \left(\frac{10\ \mathrm{GeV}}{m_{\gamma_d}}\right)^4,$$

where g_X is the $U(1)_X$ gauge coupling, μ_n is the DM-nucleon reduced mass, and m_{γ_d} is the mass of the dark photon. This is naturally in the same range observed by DAMA [217],

The scattering cross-section via kinetic mixing off the proton is $\sigma_{p,X} \approx 4 * 10^{-41}$

The various values of scattering cross-section, can be obtained from the following multiplication of various results of Mock theta function previously calculated:

(-5.74968 * 10^-40) * (-1.0058343895 * 10^-12) * (-2498.279)*(-2122.1867) * (1.6402) where 1,6402 is a Hausdorff dimension

Input interpretation:

$$-\frac{5.74968}{10^{40}} \left(-\frac{1.0058343895}{10^{12}}\right) \times (-2498.279) \times (-2122.1867) \times 1.6402$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$5.0291140894887498026838582597549 6 \times 10^{-45}$

Open code

(-5.74968 * 10^-40) * (-0.0814135)

Input interpretation:

$-\frac{5.74968}{10^{40}} \times (-0.0814135)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$4.6810157268 \times 10^{-41}$

Open code

(((sqrt((-5.74968 * 10^-40))) * 1/((-(-4.929062 * 10^6))) * (4267.24) * (1.61803)^2

where 1,61803 is the Hausdorff dimension of golden dragon

Input interpretation:

$\sqrt{-\frac{5.74968}{10^{40}}} \left(-\frac{1}{-4.929062 \times 10^6}\right) \times 4267.24 \times 1.61803^2$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$5.43473... \times 10^{-23}\, i$

We note that:

sqrt(17) ((1/(((-5.74968 * 10^-40) * (-1.0058343895 * 10^-12))))))^2

Input interpretation:

$\sqrt{17} \left(\frac{1}{-\frac{5.74968}{10^{40}} \left(-\frac{1.0058343895}{10^{12}}\right)}\right)^2$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.23278... \times 10^{103}$

The result is the SMBHs entropy contained within the Cosmic Event Horizon and is a multiple of the mean of two Hausdorff dimensions: 1.2083 and 1.2619

Note that:

$$\left(\frac{1}{2} \times 1.23278\right) \times 10^{103}$$

$0.61639 * 10^{103}$ that is a multiple very near to the Hausdorff dimension of Cantor set 0.6309

From:

Dark matter monopoles, vectors and photons
Valentin V. Khoze and Gunnar Ro - arXiv:1406.2291v3

We have that:

3.2.3 Current density of Monopoles

To determine the current density in monopoles we first have to determine the type of the Dark sector phase transition and compute the initial monopole production density accordingly. If the initial production density is lower than the estimated density after monopole-anti-monopole annihilation (3.39), the effect of annihilations is unimportant and the initial monopole density survives. If on the other hand the initial density is higher than the annihilation density, the final monopole density is set by monopole-anti-monopole annihilations expression.

The conversion from monopole density, $n_{\rm m}/s$ or $n_{\rm m}/T$, to $\Omega_{\rm m}h^2$ is standard,

$$\Omega_{\rm m}h^2 = \rho_{\rm m}\frac{1}{\rho_{\rm crit}h^{2}}, \tag{3.40}$$

$$\rho_{\rm m}h = \frac{n_{\rm m}}{s}M_{\rm m}\,s_0 = \frac{n_{\rm m}}{T^3}M_{\rm m}T_0^3, \tag{3.41}$$

where subscript 0 refers to the current time or temperature and the normalisation factors are given by,

$$\rho_{\rm crit}h^{-2} = 1.9\times10^{-29}{\rm gcm}^{-3} = 7.53\times10^{-47}\,{\rm GeV}^4, \tag{3.42}$$

$$s_0 = \frac{2\pi^2}{45}g_*(t=t_0)T_0^3, \tag{3.43}$$

with $T_0 = T_{CMB} = 2.73\,\mathrm{K} = 2.35 \times 10^{-13}\,\mathrm{GeV}$ and $g_\star(t = t_0) = 2$ in the Dark sector and 3.94 in the SM. Thus

$$\Omega_{\mathrm{m}} h^2 = \frac{n_{\mathrm{m}}}{s} \times \frac{M_{\mathrm{m}}}{1\,\mathrm{TeV}} \times 1.5 \times 10^{11}\,, \tag{3.44}$$

$$= \frac{n_{\mathrm{m}}}{T^3} \times \frac{M_{\mathrm{m}}}{1\,\mathrm{TeV}} \times 1.7 \times 10^{11}\,. \tag{3.45}$$

The current relic density of monopoles for a first order phase transition computed using (3.18), is shown in Fig 3. We see that relic density depends strongly on the dark scalar field vev $w = \langle\phi\rangle$ as this sets both the mass of the monopoles and the critical temperature of the phase transition. The density increases with lower coupling g_D as the mass of the monopoles increase.

We have that, in the Dark sector:

$s_0 = 1{,}13855 * 10^{-38}$

Input:

$$\left(\frac{1}{45}(4\pi^2)\right)\left(\frac{2.35}{10^{13}}\right)^3$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.13855... \times 10^{-38}$

And

Input:

$$\sqrt[9]{\frac{1}{\left(\frac{1}{45}(4\pi^2)\right)\left(\frac{2.35}{10^{13}}\right)^3}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

16442.24143946671024408267314676800976796389493989807649839...

16442.241439466710244082673146768009767963894939898076

1.6442241439466710244082673146768009767963894939898076 * 10^4

Result:

16442.241439466710244082673146768009767963894939898076

Continued fraction:

- Linear form

$$16442+\cfrac{1}{4+\cfrac{1}{7+\cfrac{1}{19+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

This result 1,644224 * 10^4 is a multiple very near to the Hausdorff dimension 1,6402.

We have also that:

1/((4*Pi^2)/45 * (2.35 * 10^-13)^3)) * 1/2.06   where 2.06 is a Hausdorff dimension

Input:

$$\frac{1}{\left(\frac{1}{45}\left(4\pi^2\right)\right)\left(\frac{2.35}{10^{13}}\right)^3}\times\frac{1}{2.06}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.26365\ldots\times10^{37}$

Integral representations:

- More

$$\frac{1}{\frac{1}{45}\times2.06\left(\left(4\pi^2\right)\left(\frac{2.35}{10^{13}}\right)^3\right)}=\frac{1.05201\times10^{38}}{\left(\int_0^\infty\frac{1}{1+t^2}\,dt\right)^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{\frac{1}{45}\times2.06\left(\left(4\pi^2\right)\left(\frac{2.35}{10^{13}}\right)^3\right)}=\frac{2.63004\times10^{37}}{\left(\int_0^1\sqrt{1-t^2}\,dt\right)^2}$$

Open code

$$\frac{1}{\frac{1}{45} \times 2.06 \left((4\pi^2)\left(\frac{2.35}{10^{13}}\right)^3\right)} = \frac{1.05201 \times 10^{38}}{\left(\int_0^\infty \frac{\sin(t)}{t}\, dt\right)^2}$$

This result 4,26365 is a multiple very near to the range of the mass of hypothetical dark matter particles.

1/((4*Pi^2)/45 * (2.35 * 10^-13)^3)) * 1/10^37 * e

Input:

$$\frac{1}{\left(\frac{1}{45}(4\pi^2)\right)\left(\frac{2.35}{10^{13}}\right)^3} \times \frac{1}{10^{37}}\, e$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

23.8750...

This result, is practically equal to the value of black hole entropy 23,9078.

We have also:

Input:

$$\frac{1}{\left(\frac{1}{45}(4\pi^2)\right)\left(\frac{2.35}{10^{13}}\right)^3} \times \frac{1}{10^{37}} \times 14^2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1721.49300198495351537716472363502841400546004759872968575O...

Continued fraction:

- Linear form

$$1721 + \cfrac{1}{2 + \cfrac{1}{35 + \cfrac{1}{4 + \cfrac{1}{2 + \cfrac{1}{5 + \cfrac{1}{5 + \cfrac{1}{2 + \cfrac{1}{4 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{6 + \cfrac{1}{8 + \cfrac{1}{1 + \cfrac{1}{5 + \cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

This result 1721,493 is in the range of the mass of $f_0(1710)$ candidate glueball.

In conclusion, note that:

Input:

$$\left(\left(\frac{1}{45}(4\pi^2)\right)\left(\frac{2.35}{10^{13}}\right)^3\right)^4$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$1.68036... \times 10^{-152}$

This result $1,68036 * 10^{-152}$ is a sub-multiple very near to the Hausdorff dimension 1,6826.

We have also that

Input interpretation:

$$2 \times 1.61803\left(\left(\frac{1}{45}(4\pi^2)\right)\left(\frac{2.35}{10^{13}}\right)^3\right)^2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.19487... \times 10^{-76}$

This result 4,19487 is a sub-multiple very near to the range of the mass of hypothetical dark matter particles.

We observe that $s_0 = 1{,}13855 * 10^{-38}$ can be obtained also with the following result of Mock theta function previously calculated

10^2 (-(-5.74968*10^-40))/(3*1.6826)   where 1,6826 is a Hausdorff dimension

Input interpretation:

$$10^2 \left(-\frac{-5.74968 \times 10^{-40}}{3 \times 1.6826}\right)$$

Open code

Result:

- More digits
  $1.1390467134197075953880898609295138476167835492689884... \times 10^{-38}$

This result $1{,}139046 * 10^{-38}$ is practically equal to the value of $s_0 = 1{,}13855 * 10^{-38}$ (We have that, in the Dark sector: $s_0 = 1{,}13855 * 10^{-38}$)

Now, for $7{,}53 * 10^{-47}$, we have, with the following results of Mock theta functions previously calculated, that:

((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5)

Input interpretation:

$$\frac{-5.74968 \times 10^{-40}}{-4.9290621621 \times 10^6} \times \frac{\pi}{5}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $7.32925... \times 10^{-47}$

This result $7{,}32925 * 10^{-47}$ is a good approximation to the value $7{,}53 * 10^{-47}$.

Note that:

((((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5))) * 1/(1.7712)

where 1,7712 is a Hausdorff dimension

Input interpretation:

$$\left(\frac{-5.74968 \times 10^{-40}}{-4.9290621621 \times 10^6} \times \frac{\pi}{5}\right) \times \frac{1}{1.7712}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$4.13801\ldots \times 10^{-47}$

This result 4,13801 * 10^{-47} is a sub-multiple very near to the range of the mass of hypothetical dark matter particles.

We have:

(64*2+108) * ((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5)

Input interpretation:

$$(64\times 2+108)\times \frac{-5.74968\times 10^{-40}}{-4.9290621621\times 10^{6}}\times \frac{\pi}{5}$$

Open code

Result:
- More digits
$1.72970\ldots \times 10^{-44}$

This result, that can be written also 1729,7 * 10^{-47} is a sub-multiple that is in the range of the mass of $f_0(1710)$ candidate glueball.

3^5 * ((((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5))^1/26))

Input interpretation:

$$3^5\sqrt[26]{\frac{-5.74968\times 10^{-40}}{-4.9290621621\times 10^{6}}\times \frac{\pi}{5}}$$

Open code

Result:
- More digits
$4.084938\ldots$

This result 4,084938... is very near to the range of the mass of hypothetical dark matter particles

((((3^5 * ((((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5))^1/26)))))^1/e

Input interpretation:

$$\sqrt[e]{3^5\sqrt[26]{\frac{-5.74968\times 10^{-40}}{-4.9290621621\times 10^{6}}\times \frac{\pi}{5}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:

- More digits
  1.6781956...

This result is very near to the Hausdorff dimension 1,6826 and is a good approximation to the value of the fourteenth root of Ramanujan's class invariant 1164.2696 and very near to the mass of the proton.
Indeed:

We have the following Ramanujan's class invariant $Q = \left(G_{505}/G_{101/5}\right)^3 =$ 1164,2696

$$\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3 = 1164{,}269601267364$$

and

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

48+10^3((((3^5 * ((((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5))^1/26)))))^1/e

Input interpretation:

$$48 + 10^3 \sqrt[e]{3^5 \sqrt[26]{\frac{-5.74968\times 10^{-40}}{-4.9290621621\times 10^6}\times\frac{\pi}{5}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  1726.1956...

This result 1726,1956 is in the range of the mass of $f_0(1710)$ candidate glueball.

In conclusion:

-441+10^3((((3^5 * ((((-5.74968*10^-40)) / (-4.9290621621*10^6)) * (Pi/5))^1/26)))))^1/e

Input interpretation:

$$-441 + 10^3 \sqrt[e]{3^5 \sqrt[26]{\frac{-5.74968 \times 10^{-40}}{-4.9290621621 \times 10^6} \times \frac{\pi}{5}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1237.196...

This result 1237,196 is very near to the rest mass of Delta baryon 1232±2

For 1,7 * 10^{11} we have, with the following results of Mock theta functions previously calculated, that:

(((3.0773505768*10^13))*(0.005756894276)))

Input interpretation:

$3.0773505768 \times 10^{13} \times 0.005756894276$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$1.77159819208252183968 \times 10^{11}$

Open code

This result is practically equal to the value 1,7 * 10^{11} and vary near to the Hausdorff dimension 1,7712

We note that:

(0.69897+1.6309) (((3.0773505768*10^13))*(0.005756894276)))

where 0.69897 and 1,6309 are two Hausdorff dimensions

Input interpretation:

$(0.69897 + 1.6309)(3.0773505768 \times 10^{13} \times 0.005756894276)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$4.127593479787305158615 2416 \times 10^{11}$

Open code

This result 4,1275 * 10^{11} is a multiple very near to the range of the mass of hypothetical dark matter particles.

(729-288-24) * (0.69897+1.6309) (((3.0773505768*10^13))*(0.005756894276)))

Input interpretation:

$(729 - 288 - 24)(0.69897 + 1.6309)(3.0773505768 \times 10^{13} \times 0.005756894276)$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$1.7212064810713062511425557472 \times 10^{14}$

Open code

$1.7212064810713062511425557472 \times 10^{14} = 1721{,}2 * 10^{11}$

This result 1721,2 * 10^{11} is a multiple that is in the range of the mass of $f_0(1710)$ candidate glueball.

Now, from:

Composite Twin Dark Matter - John Terning , Christopher B. Verhaaren , and Kyle Zora **-** arXiv:1902.08211v2

If the recombination of these particles into twin atoms is not sufficiently efficient then the DM remains primarily a plasma, which can develop instabilities that affect galaxy collisions, like the Bullet Cluster [2]. This translates into a bound on the twin fine structure constant α' as a function of m_D [67]:

$$\frac{\alpha'^4}{\xi}\left(\frac{\Omega_D h^2}{0.11}\right)\left(\frac{\text{GeV}}{m_D}\right)^2\left[\frac{(1+R)^2}{R}-\frac{1}{2}\alpha'^2\right]^2 \gtrsim 7.5\times 10^{\ 11}, \tag{4.4}$$

where $\Omega_D h^2$ is the relic density of dark matter and ξ is the ratio of the present day temperature of the dark radiation to the CMB temperature

$$\xi = \left(\frac{T_D}{T_{\text{CMB}}}\right)\Big|_{z=0}. \tag{4.5}$$

Recall from Fig. 1 that larger values of $m_{t'}$ also lead to larger $m_{\Delta'}$. In addition, it is clear that if $\lambda_{b'} > \lambda_b$ then even larger values of $m_{t'}$ and $m_{\Delta'}$ would be required to agree with experiment. Thus, direct detection and naturalness (preferring lighter $m_{t'}$) push us toward twin bottom Yukawas that are smaller than the SM value. This, in turn, reduces $m_{\Delta'}$, pushing it toward the naive ADM expectation of $\sim$5 GeV.

asymmetric dark matter (ADM)

The mass of the dark atom m_D

In short, twin atoms can make up an interesting ADM population. To have m_D values closest to 5 GeV, the τ' mass should be close to $m_{\Delta'}$, so that $R \sim 1$. These lightest mass atoms also require the α' coupling be somewhat stronger than in the visible sector. In addition, the velocity dependence of the self-interaction of these twin atoms agrees with self-interaction estimates better than DM with a velocity independent self-interaction cross section.

Thence, we have the following values: 7.5 * 10^{-11} and ≈ 5 GeV = 4.5 * 10^{17}

For 7.5 * 10^{-11}, we have, with the following results of Mock theta functions previously calculated, that:

(1.0933+0.6942)^3 (((-1.0058343895 × 10^-12) / (-0.07609064))) where 1.0933 and 0.6942 are two Hausdorff dimensions (0.6942 is the Asymmetric Cantor set)

Input interpretation:

$$(1.0933 + 0.6942)^3 \times \frac{-1.0058343895 \times 10^{-12}}{-0.07609064}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$7.549764319876398244005438776701050221157293459484635 6... \times 10^{-11}$

Open code

This result 7.54976 * 10^{-11} is practically equal to the value 7.5 * 10^{-11}

Now:

[(1.0933+0.6942)^3 (((-1.0058343895 × 10^-12) / (-0.07609064)))]*10^11 * 1/(0.9239102+0.9243408)

Input interpretation:

$$\left((1.0933 + 0.6942)^3 \times \frac{-1.0058343895 \times 10^{-12}}{-0.07609064}\right) \times 10^{11} \times \frac{1}{0.9239102 + 0.9243408}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.084815493066903923766544033630199697528795309449114699453...

Continued fraction:

- Linear form

$$4+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{198+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{9+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

This result 4,0848 is very near to the range of the mass of hypothetical dark matter particles.

Note that:

1/ (4.0848154930669039237665440336301996975287953094491146994537)^1/3

Input interpretation:

$$\frac{1}{\sqrt[3]{4.0848154930669039237665440336301996975287953094491146994537}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

0.625569911218934987390105583126329273010378781609950451981...

The result 0.62556991121893498739.... is very near to the Hausdorff dimension of Cantor set 0.6309

Continued fraction:

- Linear form

$$\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{27+\cfrac{1}{24+\cfrac{1}{14+\cfrac{1}{1+\cfrac{1}{30+\cfrac{1}{3+\cfrac{1}{11+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

Possible closed forms:

More

- $\tan\left(\log\left(\frac{6639065}{3796054}\right)\right) \approx 0.62556991121893498962508$

Enlarge Data Customize A Plaintext Interactive

$$\frac{25\sqrt[3]{\frac{6416366}{443081}}}{\pi^4} \approx 0.62556991121893495 5265$$

$$\frac{38432 - 151\pi - 2278\pi^2}{7874\pi} \approx 0.62556991121893498746781$$

•

and that:

1/(0.62556991121893498739)*10^3 + (64*2)

Input interpretation:

$$\frac{1}{0.62556991121893498739} \times 10^3 + 64 \times 2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

More digits

- 1726.542356443392222791362864084984580964987647684490367572...

Open code

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

For 4.5 * 10^{17}, we have, with the following results of Mock theta functions previously calculated, that:

((9.39267*10^17))*1/(0.923910+1.08753454+0.0814135-0.081816+0.07609)

Input interpretation:

$$9.39267\times 10^{17}\times \frac{1}{0.923910+1.08753454+0.0814135-0.081816+0.07609}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $4.500275890546915278057827141592824189503602273289810 6\ldots\times 10^{17}$

This result 4,5 * 10^{17} is practically equal to the above value 4.5 * 10^{17}

Note that:

((9.39267*10^17))*1/(0.6309+1.61803) * 1/10^17

where 0.6309 and 1.61803 are two Hausdorff dimensions (0.6309 is the Cantor set)

Input interpretation:

$$9.39267\times 10^{17}\times \frac{1}{0.6309+1.61803}\times \frac{1}{10^{17}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  4.176506160707536472900445989870738528989341598004384307203...

Open code

The result 4,176 is very near to the range of the mass of hypothetical dark matter particles.

(((((9.39267*10^17)))*(0.0814135+0.081816+0.07609064)))^1/6

Input interpretation:

$$\sqrt[6]{9.39267\times 10^{17}\,(0.0814135+0.081816+0.07609064)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  779.7608...

This result 779,7608 is very near to the rest mass of the Omega meson 782.65±0.12

sqrt(5) * [(((((9.39267*10^17)))*(0.0814135+0.081816+0.07609064)))^1/6] – 16

Input interpretation:

$$\sqrt{5}\,\sqrt[6]{9.39267\times 10^{17}\,(0.0814135+0.081816+0.07609064)}-16$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1727.598...

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

Now, from:

Searching a dark photon with HADES

HADES CollaborationG.Agakishiev[g]A.Balanda[c]D.Belver[r]A.Belyaev[g]J.C.Berger-Chen[i]A.Blanco[b]M.Böhmer[j]J.L.Boyard[p]P.Cabanelas[r]S.Chernenko[g]A.Dybczak[c]E.Epple[i]L.Fabbietti[i]O.Fateev[g]P.Finocchiaro[a]P.Fonte[b1]J.Friese[j]…Y.Zanevsky[g]

Show more

https://doi.org/10.1016/j.physletb.2014.02.035

ABSTRACT

We present a search for the e^+e^- decay of a hypothetical dark photon, also named U vector boson, in inclusive dielectron spectra measured by HADES in the p(3.5 GeV) + p, Nb reactions, as well as the Ar (1.756 GeV/u) + KCl reaction. An upper limit on the kinetic mixing parameter squared ϵ^2 at 90% CL has been obtained for the mass range $M_U = 0.02–0.55$ GeV/c^2 and is compared with the present world data set. For masses 0.03–0.1 GeV/c^2, the limit has been lowered with respect to previous results, allowing now to exclude a large part of the parameter region favored by the muon $g-2$ anomaly. Furthermore, an improved upper limit on the branching ratio of 2.3×10^{-6} has been set on the helicity-suppressed direct decay of the eta meson, $\eta \to e^+e^-$, at 90% CL.

at 90% CL on the mixing $\epsilon^2 = \alpha'/\alpha$ of a hypothetical dark photon U in the mass range $M_U = 0.02–0.6$ GeV/c^2. Our UL sets a tighter constraint than the recent WASA search at low masses excluding

We have a range of mass 0.02-0.55-0.6 GeV/c^2 , thence:

$1.8 * 10^{15}$; $4.95 * 10^{16}$ and $5.4 * 10^{16}$

For $4.95 * 10^{16}$, we have, with the following results of Mock theta functions previously calculated, that:

2.05((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949+1.08185+0.0814135-0.081816)^9* 0.005756894)))

Input interpretation:

$$2.05\left(9.39267\times 10^{17}\times \frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $4.954480177056606203254746657109091210015435877784386\ldots\times 10^{16}$

This result is practically equal to the first upper bound of dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$)

and:

[(((((2.05((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949+1.08185+0.0814135 -0.081816)^9* 0.005756894))))))))]^1/27

Input interpretation:

$$\left(2.05\left(9.39267\times 10^{17}\times \frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)\right)\verb|^|(1/27)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  4.152726...

This result is very near to the range of the mass of hypothetical dark matter particles.

We have that:

[((((((1.61803+0.6309)*((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949+1.08185+0.0814135-0.081816)^9* 0.005756894))))))))]

Input interpretation:

$$(1.61803+0.6309)\left(9.39267\times 10^{17}\times \frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $5.435258099798982140822291414425535851190250833469397 1\ldots\times 10^{16}$

This result is practically equal to the second upper bound of dark photon energy range (4.95 * 10^{16} – 5.4 * 10^{16})
Note that:

[((((((1.61803+0.6309)*((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949+1.08185+0.0814135-0.081816)^9* 0.005756894)))))))] * (1.00615716/5 + 1.08753454/2) * 1/10^16

Input interpretation:

$$\left((1.61803+0.6309)\left(9.39267\times 10^{17}\times \frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)\right)\left(\frac{1.00615716}{5}+\frac{1.08753454}{2}\right)\times \frac{1}{10^{16}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
4.049260229385228155833788316412768284791202025989118998152...

Or:

[((((((1.61803+0.6309)*((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949+1.08185+0.0814135-0.081816)^9* 0.005756894)))))))] * (1.5236/2) * 1/10^16

where 1.5236 is the following Hausdorff dimension

$$\log_2\left(\frac{1+\sqrt[3]{73-6\sqrt{87}}+\sqrt[3]{73+6\sqrt{87}}}{3}\right)$$

and the reciprocal is 1 /1.5236 = 0,65634024678.....

Input interpretation:

$$\left((1.61803+0.6309)\left(9.39267\times 10^{17}\times \frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)\right)\times \frac{1.5236}{2}\times \frac{1}{10^{16}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits

4.14057962042686459487842159950937321143673308493698671275 3...

The two results 4.04926 and 4.140579 are very near to the range of the mass of hypothetical dark matter particles.

Furthermore, we have that:

-7^2 + 5^2 * [(((((((((((((1.61803+0.6309)*((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949 +1.08185+0.0814135-0.081816)^9* 0.005756894))))))))*(1.5236/2) * 1/10^16))))))))]^3

Input interpretation:

$$-7^2+5^2\left(\left((1.61803+0.6309)\left(9.39267\times10^{17}\times\frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)\right)\times\frac{1.5236}{2}\times\frac{1}{10^{16}}\right)^3$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1725.6937889905199440289404085365541399584733192310282818 56...

Continued fraction:

- Linear form

$$1725+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{33+\cfrac{1}{7+\cfrac{1}{14+\cfrac{1}{420+\cfrac{1}{19+\cfrac{1}{1+\cfrac{1}{25+\cfrac{1}{3+\dots}}}}}}}}}}}}}}}}}}$$

This result 1725,6937 is very near to the range of the mass of $f_0(1710)$ candidate glueball.

And:

(8+3) * [((((((((((((1.61803+0.6309)*((((9.39267*10^17))*(2122.1867+2498.27)/(1.080949 +1.08185+0.0814135-0.081816)^9* 0.005756894))))))))*(1.5236/2) * 1/10^16))))))))]^3

Input interpretation:

$$(8+3)\left(\left(\left(1.61803+0.6309\right)\left(9.39267\times 10^{17}\times \frac{2122.1867+2498.27}{(1.080949+1.08185+0.0814135-0.081816)^9}\times 0.005756894\right)\right)\times \frac{1.5236}{2}\times \frac{1}{10^{16}}\right)^3$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

780.8652671558287753727337797560838215817282604616524440166...

This result is very near to the value of the rest mass of Omega meson 782.65±0.12

Now, from:

The Dark Top

David Poland, Jesse Thaler - https://arxiv.org/abs/0808.1290v2

In contrast, for the simple group model, the dark top has a large $SU(2)$ doublet component and (co)annihilates very efficiently through the channels $T\overline{T}' \to WW/WZ/ZZ$ and $T\overline{T}' \to W^* \to \psi\overline{\psi}'$ where ψ represents standard model fermions. Because there is only a small splitting between the lightest mass eigenstates, coannihilation effects are important. With such efficient annihilation, the preferred dark top mass is somewhat large, 980 GeV $< m_{\rm dark} <$ 1040 GeV, and potential contributions from UV physics only increase the preferred mass range further. Because annihilations to Higgs and through Higgses are subdominant, the preferred mass range shows very little sensitivity to the physical Higgs mass.

The range is 980 GeV < m_{dark} < 1040 GeV, i.e. 8.82-9.36 * 10^{19} GeV

From the following Mock Theta function (5th order), we have obtained that

ψ(q) = (32844.3)+(1.33208 × 10^10)+(9.39267 × 10^17) =

= 9.392670133208328443 × 10^{17}

And

(8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135) * [(32844.3)+(1.33208 × 10^10)+(9.39267 × 10^17)]

Input interpretation:

$(8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135)$
$(32\,844.3+1.33208\times 10^{10}+9.39267\times 10^{17})$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$9.31411556410735316105810116 42\times 10^{19}$

Or:

Input interpretation:

$(8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135)\times 9.392670133208328443\times 10^{17}$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$9.3141155641073531610581011642\times 10^{19}$

We note that the value of the function is very near to the energy of $m_{dark} = 9.36 * 10^{19}$ GeV (energy)

We have that:

1/10^77 * (1.6667+0.6309) *((((8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135)*(9.392670133208328443 * 10^17))))^4 where 0.6309 and 1.6667 are two Hausdorff dimensions

Input interpretation:

$$\frac{1}{10^{77}}(1.6667+0.6309)\left((8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135)(9.392670133208328443\times 10^{17})\right)^4$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1729.1828158097986255919304399452313640841259920671537531 54...

Open code

Continued fraction:

- Linear form

$$1729+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{3+\cfrac{1}{88+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{8+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

Open code

This result 1729.182 is very near to the range of the mass of $f_0(1710)$ candidate glueball.

We have also:

1/10^77 * (1.006157) *((((8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135)*(9.392670133208328443 * 10^17))))^4

Input interpretation:

$$\frac{1}{10^{77}}\times 1.006157\left(\left(8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135\right)\left(9.392670133208328443\times 10^{17}\right)\right)^4$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

757.2377238887271743252524180292366615567513735203304399429...

This result is very near to the value of the rest mass of Charged rho meson 775.4±0.4

We have that:

1/(1.61803+0.6309) * (8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135) * [(32844.3)+(1.33208 × 10^10)+(9.39267 × 10^17)] * 1/10^19

where 1.61803 and 0.6309 are two Hausdorff dimensions

Input interpretation:

$$\frac{1}{1.61803 + 0.6309}(8^2 + 5^2 + 3^2 + 0.9243408 + 0.07609064 + 0.081816 + 0.0814135)\left((32\,844.3 + 1.33208 \times 10^{10} + 9.39267 \times 10^{17}) \times \frac{1}{10^{19}}\right)$$

Open code

Result:

- More digits
  4.141576467078723286655476677442161383413445505195804226899...

Open code

Enlarge Data Customize A Plaintext Interactive

Repeating decimal:

- More digits
  4.141576467078723286655476677442161383413445505195804226899...

(period 52912)

This result 4,141576 is very near to the range of the mass of hypothetical dark matter particles.

We have that:

(0.538+0.6309) * 1/(1.61803+0.6309) * (8^2+5^2+3^2+0.9243408+0.07609064+0.081816+0.0814135) * [(32844.3)+(1.33208 × 10^10)+(9.39267 × 10^17)] *1/10^3

Input interpretation:

$$(0.538 + 0.6309) \times \frac{1}{1.61803 + 0.6309}(8^2 + 5^2 + 3^2 + 0.9243408 + 0.07609064 + 0.081816 + 0.0814135)\left((32\,844.3 + 1.33208 \times 10^{10} + 9.39267 \times 10^{17}) \times \frac{1}{10^3}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits
  $4.841088732368319649771586688262142441071976451023375 5... \times 10^{16}$

Open code

Repeating decimal:

- More digits
  $4.8410887323683196497715866882621424410719764510233755... \times 10^{16}$

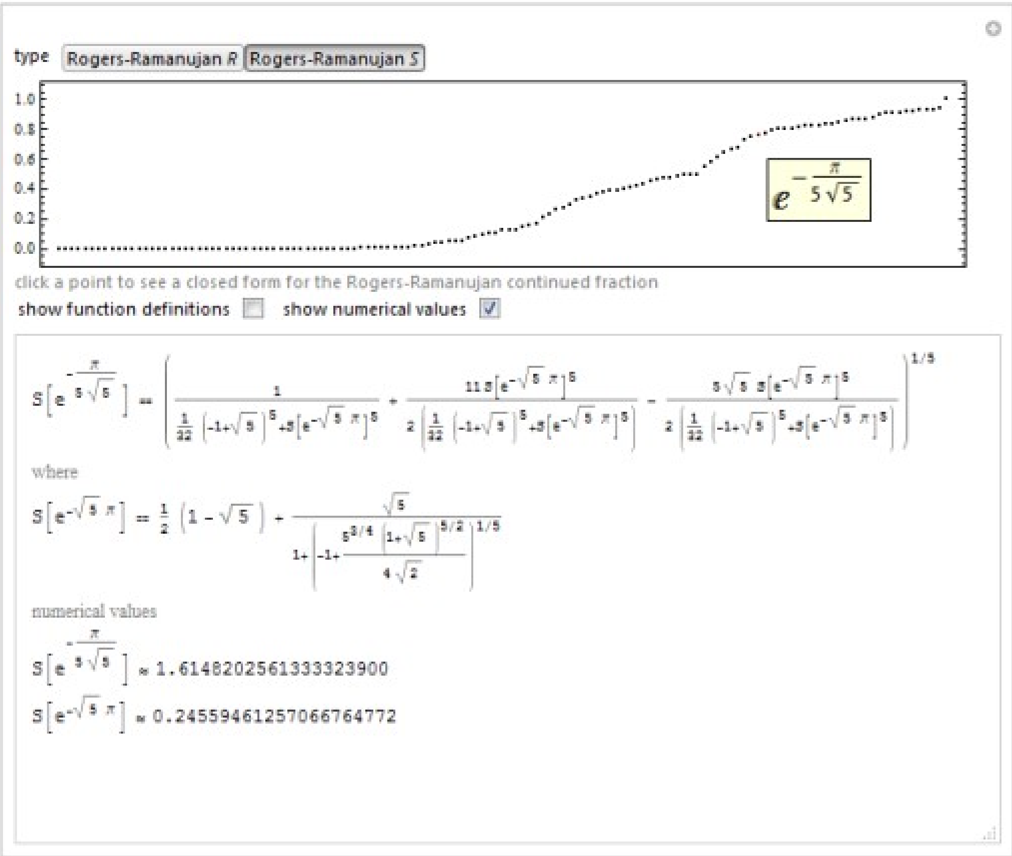
(period 52912)

This result $4.84108 * 10^{16}$ is very near to the first upper bound of dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$)

Ramanujan and Phi

From:

https://blog.wolfram.com/2013/05/01/after-100-years-ramanujan-gap-filled/



1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))

Input:

$$\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{1}{\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}}$$

Decimal approximation:

- More digits

  11.090169943749474241022934171828190588601545899028814310 67...

  Open code

(11*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))

Input:

$$\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{55\, e^{-25\sqrt{5}\,\pi^5}}{2\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)}$$

Decimal approximation:

- More digits

  $9.9929022507071872307053630412945712274243697626 5255\ldots\times 10^{-7428}$

  Open code

(5sqrt(5)*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))

Input:

$$\frac{5\sqrt{5}\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{25\sqrt{5}\, e^{-25\sqrt{5}\,\pi^5}}{2\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)}$$

Decimal approximation:

- More digits

  $1.0156731238678143887477757629564691789882352909 8784\ldots\times 10^{-7427}$

  Open code

Input interpretation:

$$\left(1\Big/\left(\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)-\frac{9.99290225070718723070536304129457122742436976265255}{10^{7428}}-\frac{1.01567312386781438874777576295646917898823529098784}{10^{7427}}\right)\right)\hat{\ }(1/5)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6180339887498948482045868343656381177203091798057628621354...

Or:

((((1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))-(-1.6382898797095665677239458827012056245798314722584 × 10^-7429)))^1/5

Input interpretation:

$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)--\frac{1.6382898797095665677239458827012056245798314722584}{10^{7429}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.6180339887498948482045868343656381177203091798057628621354...

The result, thence, is:

1.6180339887498948482045868343656381177203091798057628

This is a wonderful golden ratio, fundamental constant of various fields of mathematics and physics

Continued fraction:

- Linear form

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

Possible closed forms:

- More

$\phi \approx 1.61803398874989484820458683436563811772030917980576286213 5$

Enlarge Data Customize A Plaintext Interactive

$\Phi + 1 \approx 1.618033988749894848204586834365638117720309179805762862135$

$\frac{1}{\Phi} \approx 1.618033988749894848204586834365638117720309179805762862135$

Now, we take the three results and calculate the following interesting expressions:

(1.0156731238678143887477757629564691789882352909 8784 × 10^-7427) / (9.9929022507071872307053630412945712274243697626 5255 × 10^-7428)

Input interpretation:

$$\frac{\frac{1.01567312386781438874777576295646917898823529098784}{10^{7427}}}{\frac{9.99290225070718723070536304129457122742436976265255}{10^{7428}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.016394535227177134731442576696034652473008345277961510888...

The result is:

1.016394535227177134731442576696034652473008345277961510888

Rational approximation:

$$\frac{84\,753\,381\,552\,557\,490\,451\,770\,790\,712}{83\,386\,301\,888\,777\,894\,022\,056\,258\,371} = 1 + \frac{1\,367\,079\,663\,779\,596\,429\,714\,532\,341}{83\,386\,301\,888\,777\,894\,022\,056\,258\,371}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Continued fraction:

- Linear form

$$1 + \cfrac{1}{60 + \cfrac{1}{1 + \cfrac{1}{244 + \cfrac{1}{1 + \cfrac{1}{60 + \cfrac{1}{2 + \cfrac{1}{60 + \cfrac{1}{1 + \cfrac{1}{244 + \cfrac{1}{1 + \cfrac{1}{60 + \cfrac{1}{2 + \cfrac{1}{60 + \cfrac{1}{1 + \cfrac{1}{244 + \cfrac{1}{1 + \cfrac{1}{60 + \cfrac{1}{\dots}}}}}}}}}}}}}}}}}}$$

Possible closed forms:

- More

$$\frac{5\sqrt{5}}{11} \approx 1.0163945352271771347314425766960346524730083452779662383$$

Enlarge Data Customize A Plaintext Interactive

$$\frac{5}{11}(2\Phi + 1) \approx 1.0163945352271771347314425766960346524730083452779662383$$

$$\frac{10}{11\Phi} - \frac{5}{11} \approx 1.0163945352271771347314425766960346524730083452779662383$$

- Φ is the golden ratio conjugate

[(1.0156731238678143887477757629564691789882352909878 4 × 10^-7427) / (9.9929022507071872307053630412945712274243697626525 5 × 10^-7428)]^31

Input interpretation:

$$\left(\frac{\frac{1.01567312386781438874777576295646917898823529098784}{10^{7427}}}{\frac{9.99290225070718723070536304129457122742436976265255}{10^{7428}}}\right)^{31}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1.655510584358883198709997446159741616946175065249919104301...

The result is:

1.655510584358883198709997446159741616946175065249919104301

Rational approximation:

$$\frac{69673893686116680947888837251}{42086045443858489000117795970} = 1 + \frac{27587848242258191947771041281}{42086045443858489000117795970}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{24+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{11+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Possible closed forms:

- More

$$\frac{2729646287\,\pi}{5179934700} \approx 1.655510584358883198752922$$

Enlarge Data Customize A Plaintext Interactive

root of $555x^4 - 633x^3 + 80x^2 + 6070x - 11565$ near $x = 1.65551$ ≈ 1.6555105843588831987078084

$$\frac{1}{11}\sqrt{\frac{1}{2}(-7728 + 2352e + 40\pi + 2701\log(2))} \approx 1.65551058435888831990329$$

We note that 1,65551058... is very near to the fourteenth root of following Ramanujan's class invariant $Q = (G_{505}/G_{101/5})^3 = 1164{,}2696$

$$\left(\sqrt{\frac{113+5\sqrt{505}}{8}}+\sqrt{\frac{105+5\sqrt{505}}{8}}\right)^3 = 1164{,}269601267364$$

Indeed:

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

11.09016994374947424102293417182819058860154589902881431067 +
(1.01567312386781438874777576295646917898823529098784 × 10^-7427) /
(9.99290225070718723070536304129457122742436976265255 × 10^-7428)

Input interpretation:

$$11.09016994374947424102293417182819058860154589902881431067+\frac{\frac{1.0156731238678143887477757629564691789882352909878 4}{10^{7427}}}{\frac{9.9929022507071872307053630412945712274243697626525 5}{10^{7428}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

12.106564478976651375754376748524225241074554244306775821 55...

The result is:
12.106564478976651375754376748524225241074554244306775821 55 and is very near to the black hole entropy value 12.1904 (that is equal to the ln of 196883)

Rational approximation:

$$\frac{308989299311928902774738082929}{25522459311103200467827553378} = 12+\frac{2719787578690497160807442393}{25522459311103200467827553378}$$

Open code

Continued fraction:

- Linear form

$$12+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1597+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

Possible closed forms:

- More

$\frac{1}{22}\left(121+65\sqrt{5}\right) \approx$ 12.10656447897665137575437674852422524107455424430678 0548

Enlarge Data Customize A Plaintext Interactive

$\frac{1}{11}(65\Phi+93) \approx$ 12.10656447897665137575437674852422524107455424430678 0548

$\frac{37-9\Phi}{11(2\Phi-1)} \approx$ 12.10656447897665137575437674852422524107455424430678 0548

- Φ is the golden ratio conjugate

((11.09016994374947424102293417182819058860154589902881431067+(1.01567312386781438874777576295646917898823529098784 × 10^-7427)/(9.99290225070718723070536304129457122742436976265255 × 10^-7428))^3

Input interpretation:

$$\left(11.09016994374947424102293417182819058860154589902881431067+\frac{\frac{1.01567312386781438874777576295646917898823529098784}{10^{7427}}}{\frac{9.99290225070718723070536304129457122742436976265255}{10^{7428}}}\right)^3$$

Open code

Result:

- More digits
  1774.4458806373413609298981378884376104987967034786497005555...

The result is:

1774.4458806373413609298981378884376104987967034786497005555

Rational approximation:

$$\frac{2497836262005287330445683785493}{1407671143573068730650200572} = 1774 + \frac{627653306663402272227970765}{1407671143573068730650200572}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Continued fraction:

- Linear form

$$1774 + \cfrac{1}{2 + \cfrac{1}{4 + \cfrac{1}{8 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{13 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{4 + \cfrac{1}{3 + \cfrac{1}{6 + \cfrac{1}{10 + \cfrac{1}{2 + \cfrac{1}{11 + \cfrac{1}{1 + \cfrac{1}{6 + \cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}$$

From:

1774.4458806373413609298981378884376104987967034786497005555 – 48 =

= 1726.4458806373413609298981378884376104987967034786497005554

Result that is very near to the range of the mass of $f_0(1710)$ candidate glueball.

[exp(11.090169943749474241+(1.015673123867814388747 × 10^-7427)/(9.9929022507071872307 × 10^-7428))]^1/8

Input interpretation:

$$\sqrt[8]{\exp\left(11.090169943749474241 + \frac{\frac{1.0156731238678143887 47}{10^{7427}}}{\frac{9.9929022507071872307}{10^{7428}}}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.5417870587209305302...

This value 4,541787... is practically equal to the value of mass of the dark atom ≈ 5 GeV = 4.5 * 10^{17}

and

[exp(11.090169943749474241+(1.015673123867814388747 × 10^-7427)/(9.9929022507071872307 × 10^-7428))]^1/8 * 0.92434086

Input interpretation:

$$\sqrt[8]{\exp\left(11.090169943749474241+\frac{\frac{1.015673123867814388747}{10^{7427}}}{\frac{9.9929022507071872307}{10^{7428}}}\right)}\times 0.92434086$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.1981594...

Continued fraction:

- Linear form

$$4+\cfrac{1}{5+\cfrac{1}{21+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{8+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

The result is: 4.1981593557949754262673688150151612371075821776437263 and is a very near to the range of the mass of hypothetical dark matter particles.

(((((([exp(11.090169943749474241+(1.0156731238678143887 47 × 10^-7427)/(9.9929022507071872307 × 10^-7428))]^1/8 * (1.0061571663-0.081816+0.0814135-0.07609064)))))^1/3

Input interpretation:

$$\left(\sqrt[8]{\exp\left(11.090169943749474241+\frac{\frac{1.0156731238678143887 47}{10^{7427}}}{\frac{9.9929022507071872307}{10^{7428}}}\right)}\ (1.0061571663-0.081816+0.0814135-0.07609064)\right)\hat{}(1/3)$$

Open code

Result:

- More digits

1.616283718780967119038391999282118987049390234042755292944...

The result is: 1.6162837187809671190383919992821189870493902340427552

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{28+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{42+\cfrac{1}{2+\cfrac{1}{22+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

From:

1.6162837187809671190383919992821189870493902340427552 * 3 =

= 4.8488511563429013571151759978463569611481707021282656

and

1.6162837187809671190383919992821189870493902340427552 * 2.5849 =

= 4.17793178467692190600233947894434936962396881597711791648 where 2.5849 is a Hausdorff dimension.

The results 4,8488 and 4,1779 are very near to the values of the first of upper bound dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$) and of the range of the mass of hypothetical dark matter particles.

Note that:

1/[(5sqrt(5)*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))]

Input:

$$\frac{1}{\frac{5\sqrt{5}\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{2\, e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)}{25\sqrt{5}}$$

Decimal approximation:

- More digits

$9.845687323022498522853504497386406211369747193708929... \times 10^{7426}$

Alternate forms:

- More

$$\frac{10-11\, e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\, e^{25\sqrt{5}\,\pi^5}}{25\sqrt{5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{125}\left(10-11\, e^{25\sqrt{5}\,\pi^5}\right)\sqrt{5}+\frac{1}{5}\, e^{25\sqrt{5}\,\pi^5}$$

$$\frac{e^{25\sqrt{5}\,\pi^5}\left(\left(\sqrt{5}-1\right)^5+160\, e^{-25\sqrt{5}\,\pi^5}\right)}{400\sqrt{5}}$$

ln ((((((1/[(5sqrt(5)*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))]))))))

Input:

$$\log\left(\frac{1}{\frac{5\sqrt{5}\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)$$

Open code

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

Exact result:

$$\log\left(\frac{2\, e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)}{25\sqrt{5}}\right)$$

Decimal approximation:

- More digits

17101.28393409786327530804780300529221259899171561940725254...

Open code

Alternate forms:

- More

$$\log\left(10-11\, e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\; e^{25\sqrt{5}\,\pi^5}\right)-\frac{5\log(5)}{2}$$

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\left(2\log\left(10-11\, e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\; e^{25\sqrt{5}\,\pi^5}\right)-5\log(5)\right)$$

$$\log\left(\frac{2\, e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{2}\left(5\sqrt{5}-11\right)+5\, e^{-25\sqrt{5}\,\pi^5}\right)}{25\sqrt{5}}\right)$$

and:

1/Pi^2 * ln ((((((1/[(5sqrt(5)*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))]))))))

Input:

$$\frac{1}{\pi^2}\log\left(\frac{1}{\frac{5\sqrt{5}\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{\log\left(\frac{2 e^{25\sqrt{5}\pi^5}\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5 e^{-25\sqrt{5}\pi^5}\right)}{25\sqrt{5}}\right)}{\pi^2}$$

Decimal approximation:

- More digits

1732.7223300064901558839072178096767682076299741947913908 49...

Continued fraction:

- Linear form

$$1732+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{28+\cfrac{1}{41+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{\log\left(\frac{1}{\frac{5\sqrt{5}\,5 e^{\left(-\sqrt{5}\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5 e^{\left(-\sqrt{5}\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{\log\left(-1+\frac{2}{5\sqrt{5}}+\left(\frac{1}{5}-\frac{11}{25\sqrt{5}}\right)e^{25\sqrt{5}\pi^5}\right)}{\pi^2} - \frac{\sum_{k=1}^{\infty}\frac{125^k\left(\frac{1}{125-10\sqrt{5}+\left(-25+11\sqrt{5}\right)e^{25\sqrt{5}\pi^5}}\right)^k}{k}}{\pi^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\log\left(\frac{1}{\frac{5\sqrt{5}\,5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{\log\left(-1+\frac{2\,e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)}{25\sqrt{5}}\right)}{\pi^2} - \frac{\sum_{k=1}^{\infty}\frac{125^k\left(\frac{1}{125-10\sqrt{5}+\left(-25+11\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}}\right)^k}{k}}{\pi^2}$$

$$\frac{\log\left(\frac{1}{\frac{5\sqrt{5}\,5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{2\,i\left\lfloor\frac{\arg\left(\frac{2\,e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)}{25\sqrt{5}}-x\right)}{2\pi}\right\rfloor}{\pi} + \frac{\log(x)}{\pi^2} - \frac{\sum_{k=1}^{\infty}\frac{(-1)^k\left(\frac{2}{5\sqrt{5}}+\left(\frac{1}{5}-\frac{11}{25\sqrt{5}}\right)e^{25\sqrt{5}\,\pi^5}-x\right)^k x^{-k}}{k}}{\pi^2} \quad \text{for } x < 0$$

Integral representations:

$$\frac{\log\left(\frac{1}{\frac{5\sqrt{5}\,5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{1}{\pi^2}\int_1^{\frac{10+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}}{25\sqrt{5}}}\frac{1}{t}\,dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\log\left(\frac{1}{\frac{5\sqrt{5}\,5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = -\frac{i}{2\pi^3}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{\left(-1+\frac{2\,e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)}{25\sqrt{5}}\right)^{-s}\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \text{ for } -1<\gamma<0$$

We have that:

1/[(11*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))]

Input:

$$\frac{1}{\frac{11\times5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{2}{55}\,e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)$$

Decimal approximation:

- More digits

$$1.000710279067556221617981291357761768984865098218399\ldots\times10^{7427}$$

Alternate forms:

- More

$$\frac{1}{55}\left(10-11\,e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\,e^{25\sqrt{5}\,\pi^5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{2}{11}-\frac{1}{5}\,e^{25\sqrt{5}\,\pi^5}+\frac{1}{11}\sqrt{5}\,e^{25\sqrt{5}\,\pi^5}$$

Open code

$$\frac{1}{880}\,e^{25\sqrt{5}\,\pi^5}\left(\left(\sqrt{5}-1\right)^5+160\,e^{-25\sqrt{5}\,\pi^5}\right)$$

ln ((((1/[(11*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))])))))

Input:

$$\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\log\left(\frac{2}{55}\, e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)\right)$$

Decimal approximation:

- More digits

17101.300195693716055325886998427166364758458410796872611 94...

Alternate forms:

- More

$$\log\left(\frac{1}{55}\left(10-11\, e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\, e^{25\sqrt{5}\,\pi^5}\right)\right)$$

Enlarge Data Customize A Plaintext Interactive

$$\log\left(\frac{2}{55}\, e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{2}\left(5\sqrt{5}-11\right)+5\, e^{-25\sqrt{5}\,\pi^5}\right)\right)$$

Open code

$$25\sqrt{5}\,\pi^5-\log\left(\frac{55}{2}\right)+\log\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)$$

and:

1/Pi^2 * ln ((((1/[(11*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))])))))

Input:

$$\frac{1}{\pi^2}\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)$$

Open code

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

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{\log\left(\frac{2}{55} e^{25 \sqrt{5} \pi^5} \left(\frac{1}{32} (\sqrt{5} - 1)^5 + 5 e^{-25 \sqrt{5} \pi^5}\right)\right)}{\pi^2}$$

Decimal approximation:

- More digits

1732.723977650629872886393641942839475932747804889887454392...

Alternate forms:

- More

$$\frac{\log\left(\frac{1}{55} \left(10 - 11 e^{25 \sqrt{5} \pi^5} + 5 \sqrt{5} e^{25 \sqrt{5} \pi^5}\right)\right)}{\pi^2}$$

Enlarge Data Customize A Plaintext Interactive

$$\frac{\log\left(\frac{2}{55} e^{25 \sqrt{5} \pi^5} \left(\frac{1}{2} (5 \sqrt{5} - 11) + 5 e^{-25 \sqrt{5} \pi^5}\right)\right)}{\pi^2}$$

Open code

$$\frac{25 \sqrt{5} \pi^5 - \log\left(\frac{55}{2}\right) + \log\left(\frac{1}{32} (\sqrt{5} - 1)^5 + 5 e^{-25 \sqrt{5} \pi^5}\right)}{\pi^2}$$

Open code

Continued fraction:

- Linear form

$$1732 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{6 + \cfrac{1}{1 + \cfrac{1}{3 + \cfrac{1}{1 + \cfrac{1}{18 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{28 + \cfrac{1}{1 + \cfrac{1}{8 + \cfrac{1}{2 + \cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{\log\left(\frac{1}{55}\left(-45+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}\right)\right)}{\pi^2} - \frac{\sum_{k=1}^{\infty}\frac{\left(-\frac{55}{-45+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}}\right)^k}{k}}{\pi^2}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{\log\left(-1+\frac{2}{55}\, e^{25\sqrt{5}\,\pi^5}\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}\right)\right)}{\pi^2} - \frac{\sum_{k=1}^{\infty}\frac{\left(-\frac{55}{-45+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}}\right)^k}{k}}{\pi^2}$$

Open code

$$\frac{\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{2\, i \left\lfloor \frac{\arg\left(10+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}-55\,x\right)}{2\,\pi} \right\rfloor}{\pi} + \frac{\log(x)}{\pi^2} - \frac{\sum_{k=1}^{\infty}\frac{\left(-\frac{1}{55}\right)^k \left(10+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}-55\,x\right)^k x^{-k}}{k}}{\pi^2} \quad \text{for } x < 0$$

Integral representations:

$$\frac{\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} = \frac{1}{\pi^2}\int_1^{\frac{1}{55}\left(10+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}\right)} \frac{1}{t}\,dt$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\log\left(\frac{1}{\frac{11\times 5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}\right)}{\pi^2} =$$

$$-\frac{i}{2\pi^3}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{\left(\frac{55}{-45+\left(-11+5\sqrt{5}\right)e^{25\sqrt{5}\,\pi^5}}\right)^s \Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

The two results 1732,72233 and 1732,72397 are very similar and are very near to the range of the mass of $f_0(1710)$ candidate glueball.

Now, we have that:

27*3 + 10^3 * sqrt((exp((((((1 / (((((1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))))))^1/(1164*2-32)))))))

Input:

$$27\times 3+10^3\sqrt{\exp\left(\frac{1}{\sqrt[1164\times 2-32]{\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\, e^{\left(-\sqrt{5}\,\pi\right)^5}}}}\right)}$$

Open code

Exact result:

$$81+1000\, e^{\frac{1}{2}\sqrt[2296]{\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\, e^{-25\sqrt{5}\,\pi^5}}}$$

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

1728.858072736919434280617815816864915168670165258188187538...

Alternate forms:

- More

$$81 + 1000 e^{\frac{1}{2} \sqrt[2296]{-\frac{11}{2} + \frac{5\sqrt{5}}{2} + 5 e^{-25\sqrt{5}\pi^5}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$1000 \exp\left(\frac{1}{2} \sqrt[2296]{\frac{1}{2}\left(5\sqrt{5} - 11\right) + 5 e^{-25\sqrt{5}\pi^5}}\right) + 81$$

Open code

$$81 + 1000 e^{\frac{\sqrt[2296]{\left(\sqrt{5}-1\right)^5 + 160 e^{-25\sqrt{5}\pi^5}}}{2 \times 2^{5/2296}}}$$

Continued fraction:

- Linear form

$$1728 + \cfrac{1}{1 + \cfrac{1}{6 + \cfrac{1}{21 + \cfrac{1}{1 + \cfrac{1}{4 + \cfrac{1}{9 + \cfrac{1}{4 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{16 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{6 + \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{3 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

We have that:

1 / (((((((((((11*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5))))))))^1/(2*1164-32))))))))

Input:

$$\frac{1}{\sqrt[2\times1164-32]{\frac{11\times5 e^{\left(-\sqrt{5}\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5 + 5 e^{\left(-\sqrt{5}\pi\right)^5}\right)}}}$$

Open code

Exact result:

$$e^{(25\sqrt{5}\,\pi^5)/2296}\sqrt[2296]{\frac{2}{55}\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)}$$

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

1716.944401114722818821471990021882723351969991809758315223...

Alternate forms:

- More

$$\sqrt[2296]{\frac{1}{55}\left(10+\left(5\sqrt{5}-11\right)e^{25\sqrt{5}\,\pi^5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{\sqrt[2296]{\frac{55}{10-11\,e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\,e^{25\sqrt{5}\,\pi^5}}}}$$

Open code

$$e^{(25\sqrt{5}\,\pi^5)/2296}\sqrt[2296]{\frac{2}{55}\left(\frac{1}{2}\left(5\sqrt{5}-11\right)+5\,e^{-25\sqrt{5}\,\pi^5}\right)}$$

Continued fraction:

- Linear form

$$1716+\cfrac{1}{1+\cfrac{1}{16+\cfrac{1}{1+\cfrac{1}{70+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{23+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{21+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{1}{\sqrt[2\times1164-32]{\frac{11\left(5e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}} =$$

$$\frac{\sqrt[2296]{\frac{2}{55}}}{\sqrt[2296]{\frac{\exp\left(-\frac{\pi^5\left(\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)^5}{32\sqrt{\pi}^5}\right)}{5\exp\left(-\frac{\pi^5\left(\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)^5}{32\sqrt{\pi}^5}\right)+\frac{1}{32}\left(-1+\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)^5}}}$$

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{\sqrt[2\times1164-32]{\frac{11\left(5e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}} =$$

$$\frac{\sqrt[2296]{\frac{2}{55}}}{\sqrt[2296]{\frac{\exp\left(-\pi^5\sqrt{z_0}^5\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^5\right)}{5\exp\left(-\pi^5\sqrt{z_0}^5\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^5\right)+\frac{1}{32}\left(-1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^5}}}$$

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

$$\frac{1}{\sqrt[2\times1164-32]{\frac{11\left(5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}} =$$

$$\left(\sqrt[2296]{\frac{2}{55}}\right) \Big/ \left(\left(\exp\left(-\pi^5 \exp^5\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}^5\left(\sum_{k=0}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\right) \Big/ \left(5\exp\left(-\pi^5\exp^5\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}^5\left(\sum_{k=0}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right) + \frac{1}{32}\left(-1+\exp\left(i\pi\left\lfloor\frac{\arg(5-x)}{2\pi}\right\rfloor\right)\sqrt{x}\sum_{k=0}^{\infty}\frac{(-1)^k(5-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\right)\text{^}(1/2296) \quad \text{for } (x\in\mathbb{R} \text{ and } x<0)$$

We have that:

1/ (((((((((((((5sqrt(5)*5*(e^((-sqrt(5)*Pi))^5))) / (((2*(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5))))))))^1/(2*1164-32)))))))))

Input:

$$\frac{1}{\sqrt[2\times1164-32]{\frac{5\sqrt{5}\times5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}}$$

Open code

Exact result:

$$\frac{e^{\left(25\sqrt{5}\,\pi^5\right)/2296}\sqrt[2296]{2\left(\frac{1}{32}\left(\sqrt{5}-1\right)^5+5\,e^{-25\sqrt{5}\,\pi^5}\right)}}{5^{5/4592}}$$

Decimal approximation:

- More digits

1716.932240767562897713904103115924197988364844525361104020...

Alternate forms:

$$\frac{\sqrt[2296]{10-11\,e^{25\sqrt{5}\,\pi^5}+5\sqrt{5}\,e^{25\sqrt{5}\,\pi^5}}}{5^{5/4592}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{e^{(25\sqrt{5}\,\pi^5)/2296}\sqrt[2296]{(\sqrt{5}-1)^5+160\,e^{-25\sqrt{5}\,\pi^5}}}{\sqrt[574]{2}\;5^{5/4592}}$$

Continued fraction:

- Linear form

$$1716+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{46+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$\frac{1}{\sqrt[2\times1164-32]{\frac{5\left(\sqrt{5}\;5\,e^{\left(-\sqrt{5}\;\pi\right)^5}\right)}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\;\pi\right)^5}\right)}}} =$$

$$\left(\sqrt[2296]{2}\right)\Big/\left(\sqrt[1148]{5}\left(\left(\exp\left(-\pi^5\left(\frac{1}{z_0}\right)^{5/2\lfloor\arg(5-z_0)/(2\pi)\rfloor} z_0^{5/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)} \left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^5\right)\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)\Big/ \left(5\exp\left(-\pi^5\left(\frac{1}{z_0}\right)^{5/2\lfloor\arg(5-z_0)/(2\pi)\rfloor} z_0^{5/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)} \left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^5\right)+ \frac{1}{32}\left(-1+\left(\frac{1}{z_0}\right)^{1/2\lfloor\arg(5-z_0)/(2\pi)\rfloor} z_0^{1/2(1+\lfloor\arg(5-z_0)/(2\pi)\rfloor)} \sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^5\right)\right)\text{^}(1/2296)\right)$$

$$\frac{1}{\sqrt[2\times1164-32]{\frac{5\left(\sqrt{5}\;5\,e^{\left(-\sqrt{5}\;\pi\right)^5}\right)}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\;\pi\right)^5}\right)}}} =$$

$$1\Big/\left(\sqrt[574]{2}\;\sqrt[1148]{5}\left(\left(\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)\Big/\left(160-e^{\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}+ 5\,e^{\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}- 10\,e^{\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}\sqrt{4}^2\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^2+ 10\,e^{\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}\sqrt{4}^3\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^3- 5\,e^{\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}\sqrt{4}^4\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^4+ e^{\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^5\right)\right)\text{^}(1/2296)\right)$$

$$\frac{1}{\sqrt[2\times 1164-32]{\frac{5\left(\sqrt{5}\,5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}{2\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)}}} =$$

$$1\Bigg/\left(\sqrt[574]{2}\ \sqrt[1148]{5}\left(\left(\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)\Bigg/\left(160-\exp\left(\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)+\right.\right.\right.$$

$$5\exp\left(\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}-$$

$$10\exp\left(\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\sqrt{4}^2\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^2+$$

$$10\exp\left(\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\sqrt{4}^3\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^3-$$

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

$$\exp\left(\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\sqrt{4}^5$$

$$\left.\left.\left.\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)\right)\wedge(1/2296)\right)$$

We have that:

((((1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))))^(1.08185+1.087534+1.006157-0.07609064)

Input interpretation:

$$\left(\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}\right)^{1.08185+1.087534+1.006157-0.07609064}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1732.74...

And

((((1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5)))))^((29.7668^(1/3))

where 29.7668 is a value of the Black Hole entropy (see Table)

Input interpretation:

$$\left(\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}\right)^{\sqrt[3]{29.7668}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1731.534151150132597646379570111950361166250299421249406794...

Series representations:

- More

$$\left(\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}\right)^{\sqrt[3]{29.7668}} = \left(\frac{1}{5\,e^{-\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}4^{-k}\binom{1/2}{k}\right)^5}+\frac{1}{32}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^5}\right)^{3.09916}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\left(\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}\right)^{\sqrt[3]{29.7668}} = \left(\frac{1}{5\exp\left(-\pi^5\sqrt{4}^5\left(\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5\right)+\frac{1}{32}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^5}\right)^{3.09916}$$

Open code

$$\left(\frac{1}{\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}}\right)^{\sqrt[3]{29.7668}} =$$

$$\left(1\Bigg/\left(5\exp\left(-\frac{\pi^5\left(\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)\right)^5}{32\sqrt{\pi}^5}\right)+\frac{1}{32}\left(-1+\frac{\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}4^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{2\sqrt{\pi}}\right)^5\right)\right)^{3.09916}$$

Integral representation:

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

All the results: 1728,858 1716,944 1716,932 1732,74 and 1731,53 are very near to the range of the mass of $f_0(1710)$ candidate glueball.

Note that:

Input interpretation:

$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)-\frac{1.6382898797095665677239458827012056245798314722584}{10^{7429}}}}^{\,3}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.2360679774997896964091736687312762354406183596115257242 70...

The result is a very near to the range of the mass of hypothetical dark matter particles.

We have that:

Input interpretation:

$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)-\frac{1.6382898797095665677239458827012056245798314722584}{10^{7429}}}}^{\,\pi}\times 10^{17}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:
- More digits
$4.5347571611551792889915884948567915637887680293971326... \times 10^{17}$

Or

(1.618033988749894848204586834365638117720309179805762862135)^Pi * 10^17

Input interpretation:
$1.618033988749894848204586834365638117720309179805762862135^{\pi} \times 10^{17}$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$4.5347571611551792889915884948567915637887680293971326... \times 10^{17}$

This value is very near to the value of mass of the dark atom ≈ 5 GeV = 4.5 * 10^{17}

We have also that:

((((((((((1/(((1/32(-1+sqrt(5))^5+5*(e^((-sqrt(5)*Pi))^5))-(-1.6382898797095665677239458827012056245798314722584 × 10^-7429)))^1/5))))))^PI * 1.08753454 * 10^16

Input interpretation:
$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)-\left(-\frac{1.6382898797095665677239458827012056245798314722584}{10^{7429}}\right)}}^{\,\pi} \times 1.08753454 \times 10^{16}$$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$4.93170504... \times 10^{16}$

Or:

(1.618033988749894848204586834365638117720309179805762862135)^Pi * 1.08753454 * 10^16

Input interpretation:
$1.618033988749894848204586834365638117720309179805762862135^{\pi} \times 1.08753454 \times 10^{16}$
Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.93170504\ldots \times 10^{16}$

This result is very near to the first value of upper bound dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$)

We have that:

Input interpretation:

$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5 e^{\left(-\sqrt{5}\,\pi\right)^5}\right)--\frac{1.6382898797095665677239458827012056245798314722584}{10^{7429}}}}^{16}-\left(2^9-2^5\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1726.9995468961462151779272055188848221899451604682879449 27...

Continued fraction:

- Linear form

$$1726+\cfrac{1}{1+\cfrac{1}{2205+\cfrac{1}{1+\cfrac{1}{2205+\cfrac{1}{1+\cfrac{1}{2205+\cfrac{1}{1+\cfrac{1}{2205+\cfrac{1}{1+\cfrac{1}{2205+\cfrac{1}{1+\cfrac{1}{2205+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}$$

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

We have that:

Input interpretation:

$$\sqrt[5]{\frac{1}{\left(\frac{1}{32}\left(-1+\sqrt{5}\right)^5+5\,e^{\left(-\sqrt{5}\,\pi\right)^5}\right)--\frac{1.63828987970956656772394588270120562457983147225 84}{10^{7429}}}}^{13}+\left(12^2+8^2\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

729.001919378725499631668732407193681428832038894742746877 5...

This value is practically very near to the Ramanujan expression $6^3 + 8^3 = 9^3 - 1 = 728$

In[8]:= **FullSimplify[%]**

$$\text{Out[8]= } S[q] == \frac{1}{\left(-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}\right)^{1/5}}$$

Clearing denominators, we obtain the above form of the result.

$$\text{In[9]:= } \textbf{Together}\left[\frac{1}{\left(-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}\right)^{1/5}}\right.$$

$$\left.\frac{1}{\left(3-\sqrt{5}+\sqrt{15-6\sqrt{5}}\right)^{1/5}}\right]\left(3-\sqrt{5}+\sqrt{15-6\sqrt{5}}\right)^{1/5}$$

$$\text{Out[9]= } \left(3-\sqrt{5}+\sqrt{15-6\sqrt{5}}\right)^{1/5}$$

1/[((((((((-3+sqrt(5)+((sqrt((15-6sqrt(5)))))))))^1/5]

Input:

$$\frac{1}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

1.1512532253508328497251975828975786279999828438381825809 67...

Open code

Alternate form:

$$\sqrt[5]{3-\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}$$

Now we have that:

Input:

$$\frac{1}{\sqrt[5]{3-\sqrt{5}+\sqrt{15-6\sqrt{5}}}^{3}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{1}{\left(3-\sqrt{5}+\sqrt{15-6\sqrt{5}}\right)^{3/5}}$$

Decimal approximation:

- More digits

0.65537130206751917838441526586352602174611064720140549605 1...

Open code

Alternate forms:

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

Open code

$$\sqrt[5]{-297+131\sqrt{5}+3\sqrt{3\left(6445-2882\sqrt{5}\right)}}$$

Continued fraction:

- Linear form

$$\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{9+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{178+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{22+\cfrac{1}{1+\cfrac{1}{13+\cfrac{1}{1+\cfrac{1}{24+\cfrac{1}{4+\cfrac{1}{174+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

We have that:

Input:

$$\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

4.150902535045726873870326024254275274857801173933180120709...

Open code

The result is a very near to the range of the mass of hypothetical dark matter particles

Alternate forms:

$$\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}}$$

Open code

$$\sqrt{13}\,\sqrt[10]{29-12\sqrt{5}+2\sqrt{6\left(65-29\sqrt{5}\right)}}$$

We have that:

(1.2619-0.07609064) * sqrt(13)/[(((((((((-3+sqrt(5)+((sqrt((15-6sqrt(5))))))))))^1/5] * 1/10^16

where 1.2619 is a Hausdorff dimension (Koch curve)

Input interpretation:

$$(1.2619-0.07609064)\times\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}\times\frac{1}{10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.92218...\times 10^{16}$

This result is very near to the first value of upper bound dark photon energy range ($4.95 * 10^{16} - 5.4 * 10^{16}$)

We have that:

Input:

$$(2\times 8^2+2\times 12^2)\times\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Approximate form
- Step-by-step solution

$$\frac{416\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}$$

Decimal approximation:

- More digits

1726.775454579022379530055626089778514340845288356202930215...

Open code

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

Alternate forms:

$$\frac{416\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{3(5-2\sqrt{5})}}}$$

Open code

$$416\sqrt{13}\sqrt[10]{29-12\sqrt{5}+2\sqrt{6\left(65-29\sqrt{5}\right)}}$$

Continued fraction:

- Linear form

$$1726+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{24+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{11+\cfrac{1}{20+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}$$

We have that:

Input:

$$\sqrt[3]{\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Approximate form
- Step-by-step solution

$$\frac{\sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}$$

Decimal approximation:

- More digits

1.607117062780150613265405655226933358079687962114850128914...

Open code

This result is very near to the electric charge of positron

Alternate forms:

$$\frac{\sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}}$$

Open code

$$\sqrt[6]{13}\ \sqrt[30]{29-12\sqrt{5}+2\sqrt{6\left(65-29\sqrt{5}\right)}}$$

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{49+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{43+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

We have that:

Input:

$$-21+33^2\sqrt[3]{\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{1089\sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}-21$$

Decimal approximation:

- More digits

1729.150481367584017846026758542130426948780190743071790388...

Open code

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

Alternate forms:

$$\frac{1089\sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}}-21$$

Open code

$$\frac{3\left(363\sqrt[6]{13}-7\sqrt[15]{-3+\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}\right)}{\sqrt[15]{-3+\sqrt{5}+\sqrt{3\left(5-2\sqrt{5}\right)}}}$$

Continued fraction:

- Linear form

$$1729+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{4+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{14+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

We have that:

Input:

$$2\sqrt[3]{-21+33^2\sqrt[3]{\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$2 \sqrt[3]{\frac{1089 \sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}} - 21}$$

Decimal approximation:

- More digits

24.00532512100224685708630910953482799028395411314288760753...

Open code

This result is equal to the "modes" that correspond to the physical vibrations of a bosonic string

From (https://en.wikiversity.org/wiki/Why_10_dimensions)

1968 "Veneziano model" Euler beta function describes the strong nuclear force. When a string moves in space-time by splitting and recombining (see worldsheet diagram at right), a large number of mathematical identities must be satisfied. These are the identities of Ramanujan's modular function. The KSV loop diagrams of interacting strings can be described using modular functions. The "Ramanujan function" (an elliptic modular function? satisfies the need for "conformal symmetry") has 24 "modes" that correspond to the physical vibrations of a bosonic string. When the Ramanujan function is generalized, 24 is replaced by 8 (8 + 2 = 10) for fermionic strings.

Continued fraction:

- Linear form

$$24+\cfrac{1}{187+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{12+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{7+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}$$

We have that:

Input:

$$\left(2\sqrt[3]{-19^2+33^2\sqrt[3]{\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}}}\right)^2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$4\left(\frac{1089\sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}-361\right)^{2/3}$$

Decimal approximation:

- More digits

497.9963815274500641193916314725520182093321060701012137095...

Open code

And:

Input:

$$-2+\left(2\sqrt[3]{-19^2+33^2\sqrt[3]{\frac{\sqrt{13}}{\sqrt[5]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}}}\right)^2$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$4\left(\frac{1089\sqrt[6]{13}}{\sqrt[15]{-3+\sqrt{5}+\sqrt{15-6\sqrt{5}}}}-361\right)^{2/3}-2$$

Decimal approximation:

- More digits
-

495.9963815274500641193916314725520182093321060701012137095...

Open code

The number 496 is a very important number in superstring theory. In 1984, Michael Green and John H. Schwarz realized that one of the necessary conditions for a superstring theory to make sense is that the dimension of the gauge group of type I string theory must be 496. The group is therefore SO(32). Their discovery started the first superstring revolution. It was realized in 1985 that the heterotic string can admit another possible gauge group, namely E_8 x E_8.

Continued fraction:

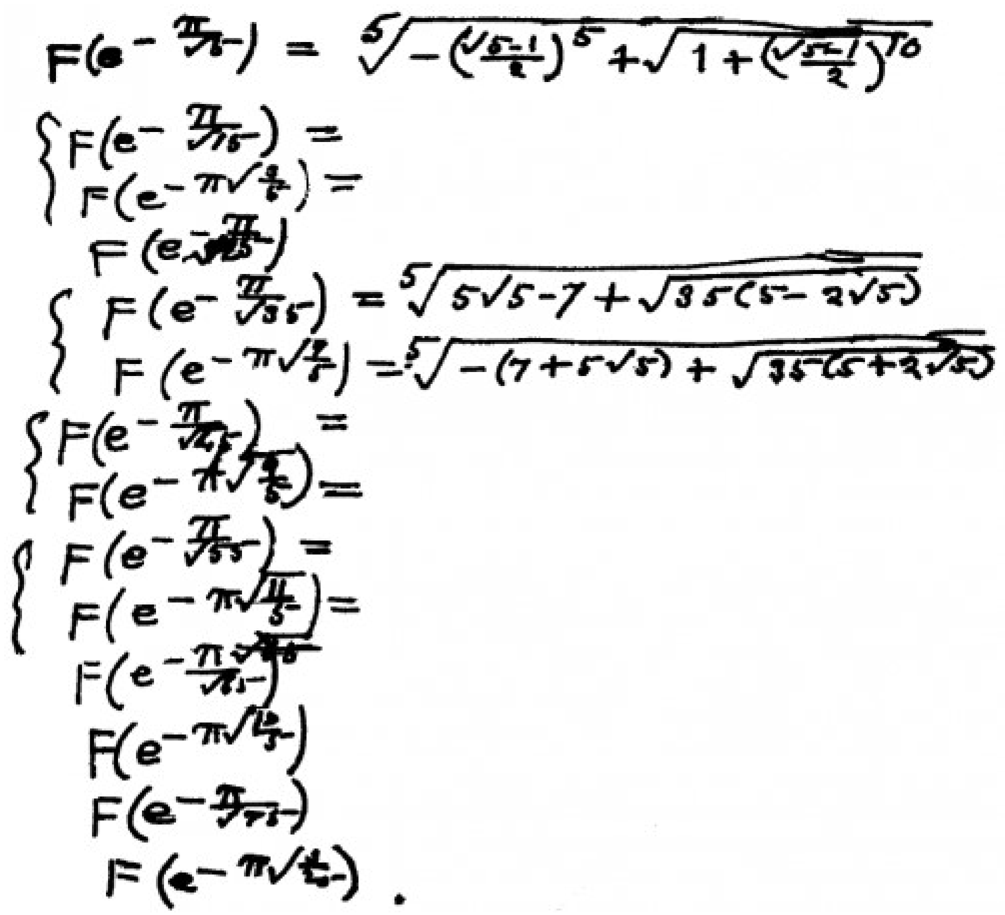
- Linear form

$$495+\cfrac{1}{1+\cfrac{1}{275+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{46+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}}}}}$$

From:

https://blog.wolfram.com/2013/05/01/after-100-years-ramanujan-gap-filled/

After 100 Years, Ramanujan Gap Filled
May 1, 2013 - Oleg Marichev, Integration & Special Function Developer, Wolfram|Alpha Scientific Content - Michael Trott, Chief Scientist, Wolfram|Alpha Scientific Content



We have that:

(((((5sqrt(5)-7+((sqrt(35(5-2sqrt(5))))))^1/5

Input:

$$\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

1.533433933531672725045223292893931793005891204687420376743...

Open code

Alternate form:

- Step-by-step solution

$$\sqrt[5]{\sqrt{175-70\sqrt{5}}+5\sqrt{5}-7}$$

Open code

((((((-(7+5sqrt(5))+((sqrt(35(5+2sqrt(5))))))^1/5

Input:

$$\sqrt[5]{-\left(7+5\sqrt{5}\right)+\sqrt{35\left(5+2\sqrt{5}\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Approximate form
- Step-by-step solution

$$\sqrt[5]{-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}$$

Decimal approximation:

- More digits

0.4873129783915109683642878984389160924219601668976538 22602...

Open code

1/[(((((5sqrt(5)-7+((sqrt(35(5-2sqrt(5))))))^1/5]

Input:

$$\frac{1}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

0.6521311274864553726831231889995637569872230925719956 49304...

Open code

We have that:

2Pi/[(((((5sqrt(5)-7+((sqrt(35(5-2sqrt(5))))))^1/5]

Input:

$$2\times\frac{\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}}$$

Open code

Result:

$$\frac{2\pi}{\sqrt[5]{-7+5\sqrt{5}+\sqrt{35\left(5-2\sqrt{5}\right)}}}$$

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

4.097460718577354170832416348428892848105876641608218235480...

Open code

Property:

$$\frac{2\pi}{\sqrt[5]{-7+5\sqrt{5}+\sqrt{35\left(5-2\sqrt{5}\right)}}} \text{ is a transcendental number}$$

Series representations:

- More

$$\frac{2\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}} = \frac{2\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(5\times 4^{-k}\sqrt{4}+\left(174-70\sqrt{5}\right)^{-k}\sqrt{174-70\sqrt{5}}\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{2\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}} = \frac{2\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)_k\left(5\left(-\frac{1}{4}\right)^k\sqrt{4}+(-1)^k\left(174-70\sqrt{5}\right)^{-k}\sqrt{174-70\sqrt{5}}\right)}{k!}}}$$

Open code

$$\frac{2\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}} = \frac{2\pi}{\sqrt[5]{-7+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(5(5-z_0)^k+\left(175-70\sqrt{5}-z_0\right)^k\right)z_0^{-k}}{k!}}}$$

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

Continued fraction:

- Linear form

$$4+\cfrac{1}{10+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{12+\cfrac{1}{184+\cfrac{1}{16+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

The result is a very near to the range of the mass of hypothetical dark matter particles

(1.2619-0.07609064) * 2Pi/[((((((5sqrt(5)-7+((sqrt(35(5-2sqrt(5))))))^1/5] * 1/10^16

Input interpretation:

$$(1.2619-0.07609064)\times 2\times \frac{\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}\times\frac{1}{10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.85881\ldots\times 10^{16}$

Series representations:

- More

$$\frac{((1.2619-0.0760906)\,2)\,\pi}{\frac{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}}{10^{16}}}=\frac{2.37162\times 10^{16}\,\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(5\times 4^{-k}\sqrt{4}+\left(174-70\sqrt{5}\right)^{-k}\sqrt{174-70\sqrt{5}}\right)}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{((1.2619-0.0760906)\,2)\,\pi}{\frac{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}}{10^{16}}} = \frac{2.37162\times 10^{16}\,\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)_k\left(5\left(-\frac{1}{4}\right)^k\sqrt{4}+(-1)^k\left(174-70\sqrt{5}\right)^{-k}\sqrt{174-70\sqrt{5}}\right)}{k!}}}$$

Open code

$$\frac{((1.2619-0.0760906)\,2)\,\pi}{\frac{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}}{10^{16}}} = \frac{2.37162\times 10^{16}\,\pi}{\sqrt[5]{-7+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(5\,(5-z_0)^k+\left(175-70\sqrt{5}-z_0\right)^k\right)z_0^{-k}}{k!}}}$$

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

Open code

This result is very near to the first value of upper bound dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$)

2/[((((((-(7+5sqrt(5))+((sqrt(35(5+2sqrt(5))))))^1/5]

Input:

$$\frac{2}{\sqrt[5]{-\left(7+5\sqrt{5}\right)+\sqrt{35\left(5+2\sqrt{5}\right)}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Approximate form
- Step-by-step solution

$$\frac{2}{\sqrt[5]{-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}}$$

Decimal approximation:

- More digits

4.104138589949855032072404940339538028930439006427259593429...

Open code

The result is a very near to the range of the mass of hypothetical dark matter particles

Alternate form:

$$2\sqrt[5]{7+5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}$$

We have also that:

(1.2619-0.07609064) * 2/[(((((((-(7+5sqrt(5))+((sqrt(35(5+2sqrt(5))))))^1/5] * 1/10^16

Input interpretation:

$$(1.2619-0.07609064)\times\frac{2}{\sqrt[5]{-(7+5\sqrt{5})+\sqrt{35(5+2\sqrt{5})}}\times\frac{1}{10^{16}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.86673\ldots\times10^{16}$

This result is very near to the first value of upper bound dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$)

We have that:

-12^2 + 8 + [[[[[[((((((([((((2Pi/(((((5sqrt(5)-7+((sqrt(35(5-2sqrt(5))))))^1/5))))]))))^1/3))))))]]]]]]^16

Input:

$$-12^2+8+\sqrt[3]{2\times\frac{\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35(5-2\sqrt{5})}}}}^{16}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\frac{32\sqrt[3]{2}\,\pi^{16/3}}{\left(-7+5\sqrt{5}+\sqrt{35\left(5-2\sqrt{5}\right)}\right)^{16/15}}-136$$

Decimal approximation:

- More digits

1712.1856482844771317223376103822398312402003318670907852 64...

Open code

Property:

$$-136+\frac{32\sqrt[3]{2}\,\pi^{16/3}}{\left(-7+5\sqrt{5}+\sqrt{35\left(5-2\sqrt{5}\right)}\right)^{16/15}}$$ is a transcendental number

Continued fraction:

- Linear form

$$1712+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{10+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

- More

$$-12^2+8+\sqrt[3]{\frac{2\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35\left(5-2\sqrt{5}\right)}}}}^{16}=-136+$$

$$32\sqrt[3]{2}\left(\frac{\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(5\times4^{-k}\sqrt{4}+\left(174-70\sqrt{5}\right)^{-k}\sqrt{174-70\sqrt{5}}\right)}}\right)^{16/3}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-12^2+8+\sqrt[3]{\frac{2\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35(5-2\sqrt{5})}}}}^{16} = -136+32\sqrt[3]{2}\left(\frac{\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{2}\right)_k\left(5\left(-\frac{1}{4}\right)^k\sqrt{4}+(-1)^k\left(174-70\sqrt{5}\right)^{-k}\sqrt{174-70\sqrt{5}}\right)}{k!}}}\right)^{16/3}$$

Open code

$$-12^2+8+\sqrt[3]{\frac{2\pi}{\sqrt[5]{5\sqrt{5}-7+\sqrt{35(5-2\sqrt{5})}}}}^{16} = -136+32\sqrt[3]{2}\left(\frac{\pi}{\sqrt[5]{-7+\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\sqrt{z_0}\left(5(5-z_0)^k+\left(175-70\sqrt{5}-z_0\right)^k\right)z_0^{-k}}{k!}}}\right)^{16/3}$$

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

The result 1712,1856 is very near to the range of the mass of $f_0(1710)$ candidate glueball.

We have that:

[((2*1/((-(7+5sqrt(5))+((sqrt(35(5+2sqrt(5))))))^1/5))]^1/3

Input:

$$\sqrt[3]{2\times\frac{1}{\sqrt[5]{-(7+5\sqrt{5})+\sqrt{35(5+2\sqrt{5})}}}}$$

Result

$$\frac{\sqrt[3]{2}}{\sqrt[15]{-7-5\sqrt{5}+\sqrt{35(5+2\sqrt{5})}}}$$

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

$1.601059011138038389379281715514491523800652829682136099919...$

Open code

This result is very near to the value of electric charge of positron

Alternate form:

$$\sqrt[3]{2}\ \sqrt[15]{7+5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}$$

Open code

We have also that:

Input:

$$-12^2+8+\sqrt[3]{2\times\frac{1}{\sqrt[5]{-\left(7+5\sqrt{5}\right)+\sqrt{35\left(5+2\sqrt{5}\right)}}}}^{16}$$

Open code

Exact result:

$$\frac{32\sqrt[3]{2}}{\left(-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}\right)^{16/15}}-136$$

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

$1728.306990494158687567647006987815309081291879224702656220...$

Open code

Alternate forms:

$$\frac{8\left(4\sqrt[3]{2}-17\left(-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}\right)^{16/15}\right)}{\left(-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}\right)^{16/15}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{32\sqrt[3]{2}}{\left(-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}\right)^{16/15}}+\frac{952}{-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}+\frac{680\sqrt{5}}{-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}-\frac{136\sqrt{35\left(5+2\sqrt{5}\right)}}{-7-5\sqrt{5}+\sqrt{35\left(5+2\sqrt{5}\right)}}$$

Open code

The result 1728,3069 is very near to the range of the mass of $f_0(1710)$ candidate glueball.

We have that:

[((((-(-sqrt(5)-1))/2))^5+sqrt(1+((((sqrt(5)-1))/2))^10)))]^1/5

Input:

$$\sqrt[5]{\left(-\frac{1}{2}\left(-\sqrt{5}-1\right)\right)^5+\sqrt{1+\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)^{10}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$$\sqrt[5]{\frac{1}{32}\left(1+\sqrt{5}\right)^5+\sqrt{1+\frac{\left(\sqrt{5}-1\right)^{10}}{1024}}}$$

Decimal approximation:

- More digits

1.646325190186273091861231700619989791183989209372270111767...

Open code

This result is a good approximation to the value of the mass of proton

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

We have:

Input:

$$\sqrt{6}\sqrt[5]{\left(-\frac{1}{2}\left(-\sqrt{5}-1\right)\right)^5+\sqrt{1+\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)^{10}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

$$\sqrt{6}\sqrt[5]{\frac{1}{32}\left(1+\sqrt{5}\right)^5+\sqrt{1+\frac{\left(\sqrt{5}-1\right)^{10}}{1024}}}$$

Decimal approximation:

- More digits

4.032656666646840839189078105757238311446924192713059068800...

The result is very near to the range of the mass of hypothetical dark matter particles

We have:

-8^2+33^2 * [((((-(-sqrt(5)-1))/2))^5+sqrt(1+((((sqrt(5)-1))/2))^10)))]^1/5

Input:

$$-8^2+33^2\sqrt[5]{\left(-\frac{1}{2}\left(-\sqrt{5}-1\right)\right)^5+\sqrt{1+\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)^{10}}}$$

Open code

Result:

$$1089\sqrt[5]{\frac{1}{32}\left(1+\sqrt{5}\right)^5+\sqrt{1+\frac{\left(\sqrt{5}-1\right)^{10}}{1024}}}-64$$

Decimal approximation:

- More digits

1728.848132112851397036881321975168882599364249006402151714...

Open code

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

We have also:

Input:

$$21^2\sqrt[5]{\left(-\frac{1}{2}\left(-\sqrt{5}-1\right)\right)^5+\sqrt{1+\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)^{10}}}$$

Open code

Result:

$$441\sqrt[5]{\frac{1}{32}\left(1+\sqrt{5}\right)^5+\sqrt{1+\frac{(\sqrt{5}-1)^{10}}{1024}}}$$

Enlarge Data Customize A Plaintext Interactive

Decimal approximation:

- More digits

726.02940887214643351080317997341549791213924133317111192894...

Open code

Alternate forms:

$$\frac{441}{2}\sqrt[5]{\sqrt{10\left(25-11\sqrt{5}\right)}+5\sqrt{5}+11}\ 2^{4/5}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$441\sqrt[5]{\frac{1}{2}\left(11+5\sqrt{5}+\sqrt{250-110\sqrt{5}}\right)}$$

Open code

$$441\sqrt[5]{\frac{1}{2}\left(11+5\sqrt{5}+\sqrt{10\left(25-11\sqrt{5}\right)}\right)}$$

This value is practically very near to the Ramanujan expression $6^3 + 8^3 = 9^3 - 1 = 728$

We know that multiplying all 21 values obtained from the Mock theta functions of the "Ramanujan last letter", we have the following final expressions:

((-1.0058343895*10^-12)*(-5.74968*10^-40)*(-1.08663428)*(-0.081816)*(-0.07609064)*(0.92391)*(-0.0814135)*(-1.00615716)*(0.9243408)))

Input interpretation:

$$-1.0058343895\times 10^{-12}\left(-5.74968\times 10^{-40}\right)\times(-1.08663428)\times(-0.081816)\times(-0.07609064)\times 0.92391\times(-0.0814135)\times(-1.00615716)\times 0.9243408$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-2.7368252918327916655091995391494943566521964877723 00...\times 10^{-55}$

Open code

(((-2.7368252918327916655091 × 10^-55)*(-4.92906*10^6)*(4.04437*10^14)*(3.07735*10^13)*(-2498.279)*(33021.10)*(-2122.186)*(1.63161*10^20)*(9.39267*10^17)*(-4267.24)*(6.596086*10^20)))

Input interpretation:

$$-2.7368252918327916655091 9 \times 10^{-55} \left(-4.92906 \times 10^{6}\right) \times 4.04437 \times 10^{14} \times 3.07735 \times 10^{13} \times (-2498.279) \times 33\,021.10 \times (-2122.186) \times 1.63161 \times 10^{20} \times 9.39267 \times 10^{17} \times (-4267.24) \times 6.596086 \times 10^{20}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$-1.2679253155135415624160519807126734461448377868813 88... \times 10^{54}$

Open code

The final result is -1,26792531 * 10^{54}

(-1.267925315513541562416051980712673446144837786881388 × 10^{54})

We have that:

1/10^18 (2*(1.2619+0.6309)) * (-(-1.267925315513541562416051980712673446144837786881388 × 10^54))^1/3

where 0.6309 and 1.2619 are two Hausdorff dimensions (0.6309 is the dimension of Cantor set)

Input interpretation:

$$\frac{1}{10^{18}} (2 (1.2619 + 0.6309)) \sqrt[3]{-(-1.267925315513541562416051980712673446144837786881388 \times 10^{54})}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.09731...

This result is very near to the range of the mass of hypothetical dark matter particles

1/10^2 * (2*(1.6379+0.6309)) * (-(-1.267925315513541562416051980712673446144837786881388 × 10^54))^1/3

where 0.6309 and 1.6379 are two Hausdorff dimensions (0.6309 is the dimension of Cantor set)

Input interpretation:

$$\frac{1}{10^{2}} (2 (1.6379 + 0.6309)) \sqrt[3]{-(-1.267925315513541562416051980712673446144837786881388 \times 10^{54})}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
- More digits
$4.91124... \times 10^{16}$

This result is very near to the first value of upper bound dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$)

Now:

integrate (-1.2679253155135415624l6 * 10^54)x x,[0, -Pi/2]

Definite integral:
- Step-by-step solution
$$\int_0^{-\frac{\pi}{2}} (-1.267925315513541562416 \times 10^{54})\, x\, x\, dx =$$
1 638 068 464 282 056 961 501 628 710 059 958 232 283 800 180 327 710 720
Open code

i.e.

Decimal approximation:
- More digits
$1.638068464282056961501628710059958232283800180327710 7... \times 10^{54}$
Open code

1,638068464282056961501628710059958232283800180327710720 * 10^{54}

Note that:

3 * (1,638068464282056961501628 71 * 10^{54}) * 1/10^38

Input interpretation:
$$3 \times 1.63806846428205696150162871 \times 10^{54} \times \frac{1}{10^{38}}$$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
$4.914205392846170884504886 13 \times 10^{16}$

and

10^3 ((2*(0.6309+1.2083) * integrate (-1.267925315513541562416 * 10^54)x x,[0, -Pi/2]))^1/4

Input interpretation:
$$10^3 \sqrt[4]{2\,(0.6309 + 1.2083) \int_0^{-\frac{\pi}{2}} (-1.267925315513541562416 \times 10^{54})\, x\, x\, dx}$$
Open code

Enlarge Data Customize A Plaintext Interactive
Result:
4.95448×10^{16}

The results 4,9142 * 10^{16} and 4,95448 * 10^{16} are practically equal to the first value of upper bound dark photon energy range (4.95 * 10^{16} – 5.4 * 10^{16})

Note that:

2.61803398 * 1/10^54 integrate (-1.2679253155135415624 16 * 10^54)x x,[0, -Pi/2]

Input interpretation:

$$2.61803398\times\frac{1}{10^{54}}\int_0^{-\frac{\pi}{2}}(-1.267925315513541562416\times10^{54})\,x\,x\,dx$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
4.28852

Or:

(1.61803)^2 * (1.638068464282056961501628 71 * 10^54) * 1/10^54 where 1.61803 is a Hausdorff dimension (golden dragon)

Input interpretation:

$$1.61803^2\,(1.63806846428205696150162871\times10^{54})\times\frac{1}{10^{54}}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
4.2884977714479138088258636824646726 39

And

1/10^13 (((1.6826) * integrate (-1.2679253155135415624 16 * 10^54)x x,[0, -Pi/2]))^1/4 where 1,6826 is a Hausdorff dimension

Input interpretation:

$$\frac{1}{10^{13}}\sqrt[4]{1.6826\int_0^{-\frac{\pi}{2}}(-1.267925315513541562416\times10^{54})\,x\,x\,dx}$$

Open code

Enlarge Data Customize A Plaintext Interactive
Result:
4.07454

The results 4.2885 and 4.07454 are very near to the range of the mass of hypothetical dark matter particles

The next two examples, of continuous fractions, are due to *S. Ramanujan*, one of the greatest mathematical geniuses.

From: https://www.cut-the-knot.org/do_you_know/fraction.shtml#sq2

$$\frac{1}{1+\frac{e^{-2\cdot\pi}}{1+\frac{e^{-4\cdot\pi}}{1+\frac{e^{-6\cdot\pi}}{1+\ldots}}}}=\left(\sqrt{\frac{5+\sqrt{5}}{2}}-\frac{\sqrt{5}+1}{2}\right)\cdot e^{2\cdot\frac{\pi}{5}}$$

$$\frac{1}{1+\frac{e^{-2\cdot\pi\cdot\sqrt{5}}}{1+\frac{e^{-4\cdot\pi\cdot\sqrt{5}}}{1+\frac{e^{-6\cdot\pi\cdot\sqrt{5}}}{1+\ldots}}}}=\left[\frac{\sqrt{5}}{1+\sqrt[5]{5^{\frac{3}{4}}\cdot\left(\frac{\sqrt{5}-1}{2}\right)^{\frac{5}{2}}-1}}-\frac{\sqrt{5}+1}{2}\right]\cdot e^{2\cdot\frac{\pi}{\sqrt{5}}}$$

For the first, we have:

[(((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))] * e^((2*Pi)/(5))

Input:

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}$$

Decimal approximation:

- More digits

0.998136044598509332150024459047074735311382994763043982185...

Open code

Property:

$$\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5} \text{ is a transcendental number}$$

Alternate forms:

$$-\frac{1}{2}\left(1+\sqrt{5}-\sqrt{2\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{1}{2}\left(-1-\sqrt{5}+\sqrt{2\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}$$

Open code

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

Series representations:

- More

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=-\frac{1}{2}e^{(2\pi)/5}+\sum_{k=0}^{\infty}2^{-1-2k}e^{(2\pi)/5}\binom{\frac{1}{2}}{k}\left(3+\sqrt{5}\right)^{-k}\left(-\sqrt{4}\left(3+\sqrt{5}\right)^{k}+2^{1+3k}\sqrt{\frac{1}{2}\left(3+\sqrt{5}\right)}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=-\frac{1}{2}e^{(2\pi)/5}+\sum_{k=0}^{\infty}\frac{(-1)^{k}2^{-1-2k}e^{(2\pi)/5}\left(-\frac{1}{2}\right)_{k}\left(3+\sqrt{5}\right)^{-k}\left(-\sqrt{4}\left(3+\sqrt{5}\right)^{k}+2^{1+3k}\sqrt{\frac{1}{2}\left(3+\sqrt{5}\right)}\right)}{k!}$$

Open code

$$\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=-\frac{1}{2}e^{(2\pi)/5}+\sum_{k=0}^{\infty}\frac{(-1)^{1+k}2^{-1-k}e^{(2\pi)/5}\left(-\frac{1}{2}\right)_{k}\sqrt{z_0}\left(-2\left(5+\sqrt{5}-2z_0\right)^{k}+2^{k}\left(5-z_0\right)^{k}\right)z_0^{-k}}{k!}$$

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

Continued fraction:

- Linear form

$$\cfrac{1}{1+\cfrac{1}{535+\cfrac{1}{2+\cfrac{1}{38+\cfrac{1}{10+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{42+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

We have that:

sqrt(exp([[[((((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))) * e^((2*Pi)/(5)))))]]]

Input:

$$\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}$$

Open code

Exact result:

$$e^{\frac{1}{2}\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}}$$

Decimal approximation:

- More digits

1.6471854150438708160049252469307171477763589117672106342 94...

Open code

This result is very near to the value 1,6402 that is a Hausdorff dimension

Alternate forms:

$$e^{-\frac{1}{4}\left(1+\sqrt{5}-\sqrt{2\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$e^{\frac{1}{4}\left(-1-\sqrt{5}+\sqrt{2\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}}$$

Series representations:

- More

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

Open code

Enlarge Data Customize A Plaintext Interactive

$$\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}=\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=-\infty}^{\infty}I_k\left(\frac{2\pi}{5}\right)\right)}$$

Open code

$$\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}=\sqrt{-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)\right)^{-k}$$

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{27+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{6+\cfrac{1}{22+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{6+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Note that:

(((((sqrt(exp([[[((((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))) * e^((2*Pi)/(5)))))]]])))))) * 10^3

Input:

$$\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\times 10^3$$

Open code

- Units »

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$1000\exp\left(\frac{1}{2}\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}\right)$$

- Units »

Decimal approximation:

- More digits

1647.185415043870816004925246930717147776358911767210634294...

Open code

- Units »

Property:

$$1000\exp\left(\frac{1}{2}\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}\right)$$ is a transcendental number

Series representations:

- More

$$\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)10^3} = 1000\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=0}^{\infty}\frac{\left(\frac{2}{5}\right)^k \pi^k}{k!}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

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

Open code

$$\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)10^3} = 1000\sqrt{-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)} \sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)\right)^{-k}$$

Continued fraction:

- Linear form

$$1647+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{5+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{91+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

This result 1647,1854 is a good approximation to the value of the rest mass of Omega baryon 1672.45±0.29

We have that:

(27*3) + (((((sqrt(exp([[[((((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))) * e^((2*Pi)/(5))))))]]]))))) * 10^3

Input:

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\times 10^3$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$1000\exp\left(\frac{1}{2}\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}\right)+81$$

Decimal approximation:

- More digits

1728.185415043870816004925246930717147776358911767210634294...

Alternative representations:

- More

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\,10^3 = 27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)w^{a}\right)}\,10^3 \text{ for } 5a=\frac{2\pi}{\log(w)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\,10^3 = 27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)z^{(2\pi)/5}\right)}\,10^3 \text{ for } z=e$$

Open code

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\,10^3 = 81+10^3\sqrt{\exp\left(\left(1+\frac{2}{-1+\coth\left(\frac{\pi}{5}\right)}\right)\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)}$$

Series representations:

- More

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\ 10^3 = 81+1000\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=0}^{\infty}\frac{\left(\frac{2}{5}\right)^k\pi^k}{k!}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\ 10^3 = 81+1000\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=-\infty}^{\infty}I_k\left(\frac{2\pi}{5}\right)\right)}$$

Open code

$$27\times 3+\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\ 10^3 = 81+1000\sqrt{-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)\right)^{-k}$$

The result 1728.1854 is result is very near to the range of the mass of $f_0(1710)$ candidate glueball.

We have:

(1.4649-1) (((((sqrt(exp([[[((((sqrt(((5+sqrt(5))/2))-((sqrt(5)+1))/2))) * e^((2*Pi)/(5))))]]]))))) * 10^3

Input interpretation:

$$(1.4649-1)\left(\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\times 10^3\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

765.776...

Series representations:

- More

$$(1.4649-1)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\,10^3 = 464.9\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=0}^{\infty}\frac{\left(\frac{2}{5}\right)^k\pi^k}{k!}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$(1.4649-1)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\,10^3 = 464.9\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=-\infty}^{\infty}I_k\left(\frac{2\pi}{5}\right)\right)}$$

Open code

$$(1.4649-1)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\,10^3 = 464.9\sqrt{-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)\right)^{-k}$$

Open code

This result 765,776 is very near to the rest mass of Charged Rho meson 775.4±0.4

We have also that:

3 * (((((sqrt(exp([[[(((((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))) * e^((2*Pi)/(5))))))]]])))))) * 10^16

Input:

$$3\left(\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\times 10^{16}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$30\,000\,000\,000\,000\,000 \exp\left(\frac{1}{2}\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}\right)$$

Decimal approximation:

- More digits

$$4.9415562451316124480147757407921514433290767353016319\ldots \times 10^{16}$$

Open code

Property:

$$30\,000\,000\,000\,000\,000 \exp\left(\frac{1}{2}\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)e^{(2\pi)/5}\right)$$

is a transcendental number

Alternative representations:

- More

$$3\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\;10^{16} = 3\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)w^{a}\right)}\;10^{16} \text{ for } 5a = \frac{2\pi}{\log(w)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$3\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\;10^{16} = 3\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)z^{(2\pi)/5}\right)}\;10^{16} \text{ for } z = e$$

Open code

$$3\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}\;10^{16} = 3\times 10^{16}\sqrt{\exp\left(\left(1+\frac{2}{-1+\coth\left(\frac{\pi}{5}\right)}\right)\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)}$$

Continued fraction:

- Linear form

$$49415562451316124 + \cfrac{1}{2 + \cfrac{1}{12 + \cfrac{1}{10 + \cfrac{1}{1 + \cfrac{1}{2 + \cfrac{1}{1 + \cfrac{1}{42 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{20 + \cfrac{1}{1 + \cfrac{1}{18 + \cfrac{1}{\ldots}}}}}}}}}}}}}}$$

The result 4.9415 * 10^{16} is practically equal to the first value of upper bound dark photon energy range (4.95 * 10^{16} – 5.4 * 10^{16})

Note that:

(0.6309+1.8617) * (((((sqrt(exp([[[((((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))) * e^((2*Pi)/(5))))))]]])))))

Input interpretation:

$$(0.6309 + 1.8617)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)} - \frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.10577...

Series representations:

- More

$$(0.6309 + 1.8617)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)} - \frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)} = 2.4926\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=0}^{\infty}\frac{\left(\frac{2}{5}\right)^k \pi^k}{k!}\right)}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$(0.6309+1.8617)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)} =$$

$$2.4926\sqrt{\exp\left(-\frac{1}{2}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\sum_{k=-\infty}^{\infty} I_k\left(\frac{2\pi}{5}\right)\right)}$$

Open code

$$(0.6309+1.8617)\sqrt{\exp\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)} =$$

$$2.4926\sqrt{-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)}$$
$$\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\exp\left(-\frac{1}{2}e^{(2\pi)/5}\left(1+\sqrt{5}-2\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\right)\right)\right)^{-k}$$

Continued fraction:

- Linear form

$$4+\cfrac{1}{9+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{17+\cfrac{1}{5+\cfrac{1}{3+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{10+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

The result 4,10577 is very near to the range of the mass of hypothetical dark matter particles.

For the second, we have:

[(((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5)))

Input:

$$\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}$$

Open code

Exact result:

$$\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\frac{\sqrt{5}}{1+\sqrt[5]{\frac{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}}{4\sqrt{2}}-1}}\right)e^{(2\pi)/5}$$

Decimal approximation:

- More digits

$-2.394121568298262756021012060092892110814640469417053415 02\ldots$

Open code

Property:

$$\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\frac{\sqrt{5}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{5}\right)^{5/2}}{4\sqrt{2}}}}\right)e^{(2\pi)/5}$$ is a transcendental number

Alternate forms:

- More

$$-\frac{1}{2}e^{(2\pi)/5}-\frac{1}{2}\sqrt{5}\,e^{(2\pi)/5}+\frac{\sqrt{5}\,e^{(2\pi)/5}}{1+\sqrt[5]{\frac{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}}{4\sqrt{2}}-1}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-\frac{\left(2^{2/5}\left(1-\sqrt{5}\right)+\frac{\left(1+\sqrt{5}\right)\sqrt[5]{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}-4\sqrt{2}}}{\sqrt[10]{2}}\right)e^{(2\pi)/5}}{2\left(2^{2/5}+\frac{\sqrt[5]{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}-4\sqrt{2}}}{\sqrt[10]{2}}\right)}$$

Series representations:

- More

$$\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5} = -\frac{1}{2}e^{(2\pi)/5}-\frac{1}{2}e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}+\frac{e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5} = -\frac{1}{2}e^{(2\pi)/5}-\frac{1}{2}e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}+\frac{e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

$$\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5} = -\frac{1}{2}e^{(2\pi)/5}-\frac{1}{2}e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}+\frac{e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

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

Continued fraction:

- Linear form

$$-2+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-6+\cfrac{1}{-4+\cfrac{1}{-1+\cfrac{1}{-8+\cfrac{1}{-54+\cfrac{1}{-2+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-1+\cfrac{1}{-7+\cfrac{1}{-1+\cfrac{1}{\cdots}}}}}}}}}}}}}}}}$$

-(1.0812+0.6942) * [((((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5)))

where 1.0812 and 0.6942 are two Hausdorff dimension

Input interpretation:

$$-(1.0812+0.6942)\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

4.25052...

Series representations:

- More

$$-(1.0812+0.6942)\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=$$

$$0.8877\,e^{(2\pi)/5}+0.8877\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}-\frac{1.7754\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-(1.0812+0.6942)\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5} =$$

$$0.8877\,e^{(2\pi)/5}+0.8877\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}-$$

$$\frac{1.7754\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

$$-(1.0812+0.6942)\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5} =$$

$$0.8877\,e^{(2\pi)/5}+0.8877\,e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}-$$

$$\frac{1.7754\,e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

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

This result 4.25052 is a very near to the range of the mass of hypothetical dark matter particles

We have:

-(2.06) * [((((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5))) * 10^16

Where 2,06 is a Hausdorff dimension

Input:

$$-2.06\left(\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)\times 10^{16}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

$4.93189\ldots\times 10^{16}$

Series representations:

- More

$$-2.06\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)10^{16}=$$

$$1.03\times 10^{16}\,e^{(2\pi)/5}+1.03\times 10^{16}\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}-$$

$$\frac{2.06\times 10^{16}\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-2.06\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)10^{16}=$$

$$1.03\times 10^{16}\,e^{(2\pi)/5}+1.03\times 10^{16}\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}-$$

$$\frac{2.06\times 10^{16}\,e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^{k}\left(-\frac{1}{2}\right)_{k}}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

$$-2.06\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)10^{16} =$$

$$1.03\times 10^{16}\, e^{(2\pi)/5} + 1.03\times 10^{16}\, e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (5-z_0)^k z_0^{-k}}{k!} - \frac{2.06\times 10^{16}\, e^{(2\pi)/5}\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (5-z_0)^k z_0^{-k}}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{z_0}\,\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (5-z_0)^k z_0^{-k}}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

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

The result 4.93189 * 10^{16} is practically equal to the first value of upper bound dark photon energy range (4.95 * 10^{16} – 5.4 * 10^{16})

We have that:

-27 + 72 * (((-(1.0812+0.6942) * [((((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5))))))^3

Input interpretation:

$$-27+72\left(-(1.0812+0.6942)\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)\right)^3$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

1727.15...

Continued fraction:

- Linear form

$$1727+\cfrac{1}{6+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{29+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{157+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}$$

The result 1727,15 is very near to the range of the mass of $f_0(1710)$ candidate glueball.

We have that:

32 * (((-(1.0812+0.6942) * [(((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5))))))^3

Input interpretation:

$$32\left(-(1.0812+0.6942)\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)\right)^3$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- More digits

779.623...

This result is very near to the rest mass of Omega meson 782.65±0.12

(1.6990+0.6309) * [(((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5))))))^8

Input interpretation:

$$(1.6990+0.6309)\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)^8$$

Open code

Enlarge Data Customize A Plaintext Interactive

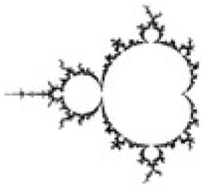
Result:

- More digits

2514.82...

This result is very near to the rest mass of charmed Sigma baryon 2517.9±0.6

Now, if we take the above formula, multiplying for 2, the number representing the Hausdorff dimension of boundary of the Mandelbrot set (see fig.), where the boundary and the set itself have the same dimension,



we obtain:

-2 * ((((([(((((sqrt(5) / [1+(((5^(3/4)*((sqrt(5)-1))/2))^(5/2)-1))))^1/5] - (((((sqrt(5)+1))/2))))] * e^((2*Pi)/(5)))))))

Input:

$$-2\left(\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(5^{3/4}\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Exact result:

$$-2\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\frac{\sqrt{5}}{1+\sqrt[5]{\frac{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}}{4\sqrt{2}}-1}}\right)e^{(2\pi)/5}$$

Decimal approximation:

- More digits

4.788243136596525512042024120185784221629280938834106830047...

Open code

Property:

$$-2\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\frac{\sqrt{5}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{5}\right)^{5/2}}{4\sqrt{2}}}}\right)e^{(2\pi)/5} \text{ is a transcendental number}$$

Open code

Continued fraction:

- Linear form

$$4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{17+\cfrac{1}{27+\cfrac{1}{5+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{67+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{19+\cfrac{1}{\ldots}}}}}}}}}}}}}}}}}}}}}}$$

Alternate forms:

- More

$$e^{(2\pi)/5}+\sqrt{5}\,e^{(2\pi)/5}-\frac{2\sqrt{5}\,e^{(2\pi)/5}}{1+\sqrt[5]{\frac{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}}{4\sqrt{2}}-1}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(2^{2/5}\left(1-\sqrt{5}\right)+\frac{\left(1+\sqrt{5}\right)\sqrt[5]{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}-4\sqrt{2}}}{\sqrt[10]{2}}\right)e^{(2\pi)/5}}{2^{2/5}+\frac{\sqrt[5]{5\times 5^{7/8}\left(\sqrt{5}-1\right)^{5/2}-4\sqrt{2}}}{\sqrt[10]{2}}}$$

Series representations:

- More

$$-2\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=$$

$$e^{(2\pi)/5}+e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}-\frac{2e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}4^{-k}\binom{\frac{1}{2}}{k}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$-2\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=$$

$$e^{(2\pi)/5}+e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}-\frac{2e^{(2\pi)/5}\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{4}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{4}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

Open code

$$-2\left(\frac{\sqrt{5}}{1+\sqrt[5]{\left(\frac{1}{2}\times 5^{3/4}\left(\sqrt{5}-1\right)\right)^{5/2}-1}}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}=$$

$$e^{(2\pi)/5}+e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}-\frac{2\,e^{(2\pi)/5}\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}}{1+\sqrt[5]{-1+\frac{5\times 5^{7/8}\left(-1+\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(5-z_0)^k z_0^{-k}}{k!}\right)^{5/2}}{4\sqrt{2}}}}$$

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

This result 4.78824313659652551204202412018…… represent a transcendental number and is very near to the first value of upper bound dark photon energy range ($4.95 * 10^{16} – 5.4 * 10^{16}$) without multiplying the base and its exponent. Furthermore the fact that in different expressions the results are transcendental numbers could support the hypothesis that the value of the mass of dark matter particles is also a transcendental number.

Now, we take the two results (transcendental numbers):

0.998136044598509332150024459047074735311382994763043982185...

−2.394121568298262756021012060092892110814640469417053415 02...

and calculate:

1/2.05 * ((([(((sqrt(((5+sqrt(5))/2)))-((sqrt(5)+1))/2)))] * e^((2*Pi)/(5)) + 2.394121568298262756)))

where 2.05 is a Hausdorff dimension

Input interpretation:

$$\frac{1}{2.05}\left(\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}+2.394121568298262756\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

Result:

- Fewer digits
- More digits

1.654759811169157116170743638559548651371406338908801942529...

Series representations:

- More

$$\frac{\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}+2.39412156829826275600000}{2.05}=$$
$$1.16786-0.243902\,e^{(2\pi)/5}+\sum_{k=0}^{\infty}0.487805\times 4^{-k}\,e^{(2\pi)/5}\binom{\frac{1}{2}}{k}\left(3+\sqrt{5}\right)^{-k}\left(-0.5\sqrt{4}\left(3+\sqrt{5}\right)^{k}+8^{k}\sqrt{\frac{1}{2}\left(3+\sqrt{5}\right)}\right)$$

Open code

Enlarge Data Customize A Plaintext Interactive

$$\frac{\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}+2.39412156829826275600000}{2.05}=$$
$$1.16786-0.243902\,e^{(2\pi)/5}+\sum_{k=0}^{\infty}-\frac{1}{k!}0.243902\,e^{(2\pi)/5}\left(-\frac{1}{2}\right)_{k}\left(3+\sqrt{5}\right)^{-k}\left(\left(-\frac{1}{4}\right)^{k}\sqrt{4}\left(3+\sqrt{5}\right)^{k}-2(-2)^{k}\sqrt{\frac{1}{2}\left(3+\sqrt{5}\right)}\right)$$

Open code

$$\frac{\left(\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}-\frac{1}{2}\left(\sqrt{5}+1\right)\right)e^{(2\pi)/5}+2.39412156829826275600000}{2.05}=$$
$$1.16786-0.243902\,e^{(2\pi)/5}+\sum_{k=0}^{\infty}\frac{1}{k!}e^{(2\pi)/5}\left(-\frac{1}{2}\right)_{k}\sqrt{z_0}\left(0.487805\left(-\frac{1}{2}\right)^{k}\left(5+\sqrt{5}-2z_0\right)^{k}-0.243902(-1)^{k}(5-z_0)^{k}\right)z_0^{-k}$$
$$\text{for not }\left(\left(z_0\in\mathbb{R}\text{ and }-\infty<z_0\le 0\right)\right)$$

Open code

Continued fraction:

- Linear form

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{8+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{67+\cfrac{1}{25+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{7+\cfrac{1}{11+\cfrac{1}{1+\cfrac{1}{16+\cfrac{1}{2+\cfrac{1}{4+\cfrac{1}{\ddots}}}}}}}}}}}}}}}}}}}}}}$$

Or:

1/2.05 ((0.99813604459850933321500244 - (-2.39412156829826275 6))

Input interpretation:

$$\frac{1}{2.05}(0.99813604459850933321500244+2.394121568298262756)$$

Result:

- More digits

1.654759811169157116170743609756097560975609756097560975609...

Repeating decimal:

$1.6547598111691571161707436\overline{09756}$ (period 5)

The result that we have obtained: 1.654759811169157116170743609756…. is very near to the Ramanujan's class invariant:

(1164.2696)^1/14

Input interpretation:

$$\sqrt[14]{1164.2696}$$

Result:

- More digits

1.655784548676001664649597457275684816357913593417766990422...

From:

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

Spyros D. Avramis, Alex Kehagias and Constantina Mattheopoulou

Published by Institute of Physics Publishing for SISSA - Received: September 7, 2007 - Accepted: October 28, 2007 - Published: November 9, 2007

Table

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

Bound of DM particle mass

From:

Phenomenological consequences of superfluid dark matter with baryon-phonon coupling

Lasha Berezhiani -Max-Planck-Institut fur Physik, Fohringer Ring 6, 80805 Munchen, Germany *Benoit Famaey* - Universite de Strasbourg, CNRS UMR 7550, Observatoire astronomique de Strasbourg, 11 rue de l'Universite, F-67000 Strasbourg, France - *Justin Khoury* - Center for Particle Cosmology, Department of Physics and Astronomy, University of Pennsylvania, Philadelphia PA 19104, USA (Dated: November 17, 2017)

Using (22) this translates to an upper bound on the mass of the DM particle:

$$m \lesssim 4.2 \left(\frac{\sigma/m}{\mathrm{cm}^2/\mathrm{g}}\right)^{1/4} \mathrm{eV}\,. \tag{24}$$

Smaller and less massive galaxies result in a somewhat weaker bound.

The bound (24) on the DM particle mass is the main result of this Section. It shows that for values of σ/m satisfying the merging-cluster bound $\sim 1\,\mathrm{cm}^2/\mathrm{g}$ [85–88], m must be somewhat below 4 eV. The dependence on the cross section is rather weak, however, scaling as the 1/4 power. It should be mentioned that the upper bound (24) would be somewhat tighter had we assumed a $\rho \propto r^{-2}$ transition density profile outside the superfluid core, instead of $\rho \propto r^{-3}$.

Appendix A

Last letter of S. Ramanujan to G.H. Hardy

S. Ramanujan to G.H. Hardy **12 January 1920**

University of Madras

I am extremely sorry for not writing you a single letter up to now ... I discovered very interesting functions recently which I call "Mock" ϑ-functions. Unlike the "False" ϑ-functions (studied partially by Prof. Rogers in his interesting paper) they enter into mathematics as beautifully as the ordinary ϑ-function. I am sending you with this letter some examples ...

If we consider a ϑ-function in the transformed Eulerian form e.g.

$$(A) \quad 1+\frac{q}{(1-q)^2}+\frac{q^4}{(1-q)^2(1-q^2)^2}+\frac{q^9}{(1-q)^2(1-q^2)^2(1-q^3)^2}+\dots$$

$$(B) \quad 1+\frac{q}{1-q}+\frac{q^4}{(1-q)(1-q^2)}+\frac{q^9}{(1-q)(1-q^2)(1-q^3)}+\dots$$

and determine the nature of the singularities at the points $q=1, q^2=1, q^3=1, q^4=1, q^5=1, \dots$ we know how beautifully the asymptotic form of the function can be expressed in a very neat and closed exponential form. For instance when $q=e^{-t}$ and $t \to 0$

$$\begin{aligned}(A) &= \sqrt{\frac{t}{2\pi}}\exp\left(\frac{\pi^2}{6t}-\frac{t}{24}\right) * + o(1)\dagger \\ (B) &= \frac{\exp\left(\frac{\pi^2}{15t}-\frac{t}{60}\right)}{\sqrt{\frac{5-\sqrt{5}}{2}}} * + o(1)\dagger\end{aligned}$$

and similar results at other singularities.* It is not necessary that there should be only one term like this. There may be many terms but <u>the number of terms must be finite.</u> † Also $o(1)$ may turn out to be $O(1)$. That is all. For instance when $q \to 1$ the function

$$\frac{1}{\{(1-q)(1-q^2)(1-q^3)\dots\}^{120}}$$

is equivalent to the sum of five terms like (*) together with $O(1)$ instead of $o(1)$.

If we take a number of functions like (A) and (B) it is only in a limited number of cases the terms close as above; but in the majority of cases they never close as above. For instance when $q = e^{-t}$ and $t \to 0$

$$(C) \quad 1 + \frac{q}{(1-q)^2} + \frac{q^3}{(1-q)^2(1-q^2)^2} + \frac{q^6}{(1-q)^2(1-q^2)^2(1-q^3)^2} + \ldots$$

$$= \sqrt{\frac{t}{2\sqrt{5}}} \exp\left(\frac{\pi^2}{5t} + a_1 t + a_2 t^2 + \ldots + O(a_k t^k)\right)$$

where $a_1 = \frac{1}{8\sqrt{5}}$, and so on. The function (C) is a simple example of a function behaving in an unclosed form at the singularities.

*The coefficient (of) $1/t$ in the index of e happens to be $\frac{\pi^2}{5}$ in this particular case. It may be some other transcendental numbers in other cases.

†The coefficients of $t, t^2, \ldots$ happen to be $\frac{1}{8\sqrt{5}}, \ldots$ in this case. In other cases they may turn out to be some other algebraic numbers.

Now a very interesting question arises. Is the converse of the statements concerning the forms (A) and (B) true? That is to say Suppose there is a function in the Eulerian form and suppose that all or an infinity of points $q = e^{2i\pi m/n}$ are exponential singularities and also suppose that at these points the asymptotic form of the function closes as neatly as in the cases of (A) and (B). The question is:– is the function taken the sum of two functions one of which is an ordinary ϑ function and the other a (trivial) function which is $O(1)$ at all the points $e^{2i\pi m/n}$? The answer is it is not necessarily so. When it is not so I call the function Mock ϑ-function. I have not proved rigorously that it is not necessarily so. But I have constructed a number of examples in which it is inconceivable to construct a ϑ-function to cut out the singularities of the original function. Also I have shown if it is necessarily so then it leads to the following assertion:–viz. it is possible to construct two power series in x namely $\sum_0^\infty a_n x^n$ and $\sum b_n x^n$ both of which have essential singularities on the unit circle, are convergent when $|x| < 1$, and tend to finite limits at every point $x = e^{2i\pi r/s}$ and that at the same time the limit of $\sum_0^\infty a_n x^n$ at the point $x = e^{-2i\pi r/s}$ is equal to the limit of $\sum_0^\infty b_n x^n$ at the point $x = e^{-2i\pi r/s}$.

This assertion seems to be untrue. Any how we shall go to the examples and see how far our assertions are true.

2

I have proved that if

$$f(q) = 1 + \frac{q}{(1+q)^2} + \frac{q^4}{(1+q)^2(1+q^2)^2} + \ldots$$

then

$$f(q) + (1-q)(1-q^3)(1-q^5)\ldots(1-2q+2q^4-2q^9+\ldots) = O(1)$$

at all the points $q=-1, q^3=-1, q^5=-1, q^7=-1, \ldots$, and at the same time

$$f(q) - (1-q)(1-q^3)(1-q^5)\ldots(1-2q+2q^4-\ldots) = O(1)$$

at all the points $q^2=-1, q^4=-1, q^6=-1, \ldots$ Also obviously $f(q)=O(1)$ at all the points $q=1, q^3=1, q^5=1, \ldots$ And so $f(q)$ is a Mock ϑ function. When $q=-e^{-t}$ and $t \to 0$

$$f(q) + \sqrt{\frac{\pi}{t}} \exp\left(\frac{\pi^2}{24t} - \frac{t}{24}\right) \to 4.$$

The coefficient of q^n in $f(q)$ is

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

It is inconceivable that a single ϑ function could be found to cut out the singularities of $f(q)$.
Mock ϑ-functions

$$\phi(q) = 1 + \frac{q}{1+q^2} + \frac{q^4}{(1+q^2)(1+q^4)} + \ldots$$

$$\psi(q) = \frac{q}{1-q} + \frac{q^4}{(1-q)(1-q^3)} + \frac{q^9}{(1-q)(1-q^3)(1-q^5)} + \ldots$$

$$\chi(q) = 1 + \frac{q}{1-q+q^2} + \frac{q^4}{(1-q+q^2)(1-q^2+q^4)} + \ldots$$

These are related to $f(q)$ as shown below.

$$2\phi(-q) - f(q) = f(q) + 4\psi(-q)$$

$$
\begin{aligned}
&= \frac{1-2q+2q^4-2q^9+\dots}{(1+q)(1+q^2)(1+q^3)\dots} \\
4\chi(q)-f(q) &= \frac{(1-2q^3+2q^{12}-\dots)^2}{(1-q)(1-q^2)(1-q^3)\dots}
\end{aligned}
$$

These are of the 3rd order.

Mock ϑ-functions (of 5th order)

$$
\begin{aligned}
f(q) &= 1+\frac{q}{1+q^2}+\frac{q^4}{(1+q)(1+q^2)}+\frac{q^9}{(1+q)(1+q^2)(1+q^3)}+\dots \\
\phi(q) &= 1+q(1+q)+q^4(1+q)(1+q^3)+q^9(1+q)(1+q^3)(1+q^5)+\dots \\
\psi(q) &= q+q^3(1+q)+q^6(1+q)(1+q^2)+q^{10}(1+q)(1+q^2)(1+q^3)+\dots \\
\chi(q) &= 1+\frac{q}{1-q^2}+\frac{q^2}{(1-q^3)(1-q^4)}+\frac{q^3}{(1-q^4)(1-q^5)(1-q^6)}+\dots \\
&= 1+\left\{\frac{q}{1-q}+\frac{q^3}{(1-q^2)(1-q^3)}+\frac{q^5}{(1-q^3)(1-q^4)(1-q^5)}+\dots\right\}
\end{aligned}
$$

$$F(q)=1+\frac{q^2}{1-q}+\frac{q^8}{(1-q)(1-q^3)}+\dots$$

$$\phi(-q)+\chi(q)=2F(q).$$

$$f(-q)+2F(q^2)-2=\phi(-q^2)+\psi(-q)$$

$$= 2\phi(-q^2)-f(q)=\frac{1-2q+2q^4-2q^9+\dots}{(1-q)(1-q^4)(1-q^6)(1-q^9)\dots}$$

$$\psi(q)-F(q^2)+1=q\frac{1+q^2+q^6+q^{12}+\dots}{(1-q^8)(1-q^{12})(1-q^{28})\dots}$$

Mock ϑ-functions (of 5th order)

$$
\begin{aligned}
f(q) &= 1+\frac{q^2}{1+q}+\frac{q^6}{(1+q)(1+q^2)}+\frac{q^12}{(1+q)(1+q^2)(1+q^3)}+\dots \\
\phi(q) &= q+q^4(1+q)+q^9(1+q)(1+q^3)+\dots \\
\psi(q) &= 1+q(1+q)+q^3(1+q)(1+q^2)+q^6(1+q)(1+q^2)(1+q^3)+\dots
\end{aligned}
$$

$$\chi(q) = \frac{1}{1-q} + \frac{q}{(1-q^2)(1-q^3)} + \frac{q^2}{(1-q^3)(1-q^4)(1-q^5)} + \frac{q^3}{(1-q^4)(1-q^5)(1-q^6)(1-q^7)} + \dots$$

$$F(q) = \frac{1}{1-q} + \frac{q^4}{(1-q)(1-q^3)} + \frac{q^{12}}{(1-q)(1-q^3)(1-q^5)} + \dots$$

have got similar relations as above.
Mock ϑ-functions (of 7th order)

(i) $$1 + \frac{q}{1-q^2} + \frac{q^4}{(1-q^3)(1-q^4)} + \frac{q^9}{(1-q^4)(1-q^5)(1-q^6)} + \dots$$

(ii) $$\frac{q}{1-q} + \frac{q^4}{(1-q^2)(1-q^3)} + \frac{q^9}{(1-q^3)(1-q^4)(1-q^5)} + \dots$$

(iii) $$\frac{1}{1-q} + \frac{q^2}{(1-q^2)(1-q^3)} + \frac{q^6}{(1-q^3)(1-q^4)(1-q^5)} + \dots$$

These are not related to each other.

Ever yours sincerely
S.Ramanujan

References

Wikipedia

S. Ramanujan to G.H. Hardy 12 January 1920 - University of Madras

George E. Andrews and Bruce C. Berndt, Ramanujan's Lost Notebook: Part I (Springer, 2005, ISBN 0-387-25529-X)[104]

George E. Andrews and Bruce C. Berndt, Ramanujan's Lost Notebook: Part II, (Springer, 2008, ISBN 978-0-387-77765-8)

George E. Andrews and Bruce C. Berndt, Ramanujan's Lost Notebook: Part III, (Springer, 2012, ISBN 978-1-4614-3809-0)

George E. Andrews and Bruce C. Berndt, Ramanujan's Lost Notebook: Part IV, (Springer, 2013, ISBN 978-1-4614-4080-2)

George E. Andrews and Bruce C. Berndt, Ramanujan's Lost Notebook: Part V, (Springer, 2018, ISBN 978-3-319-77832-7)