On some Ramanujan equations concerning the continued fractions. Further possible mathematical connections with some parameters of Particle Physics and Cosmology V.

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Abstract

In this research thesis, we have analyzed and deepened some equations concerning the Ramanujan continued fractions. Further possible mathematical connections with some parameters of Particle Physics and Cosmology.

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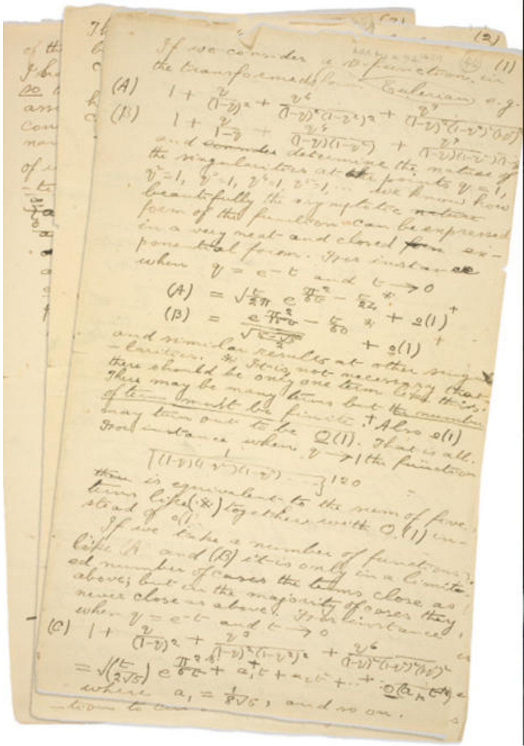
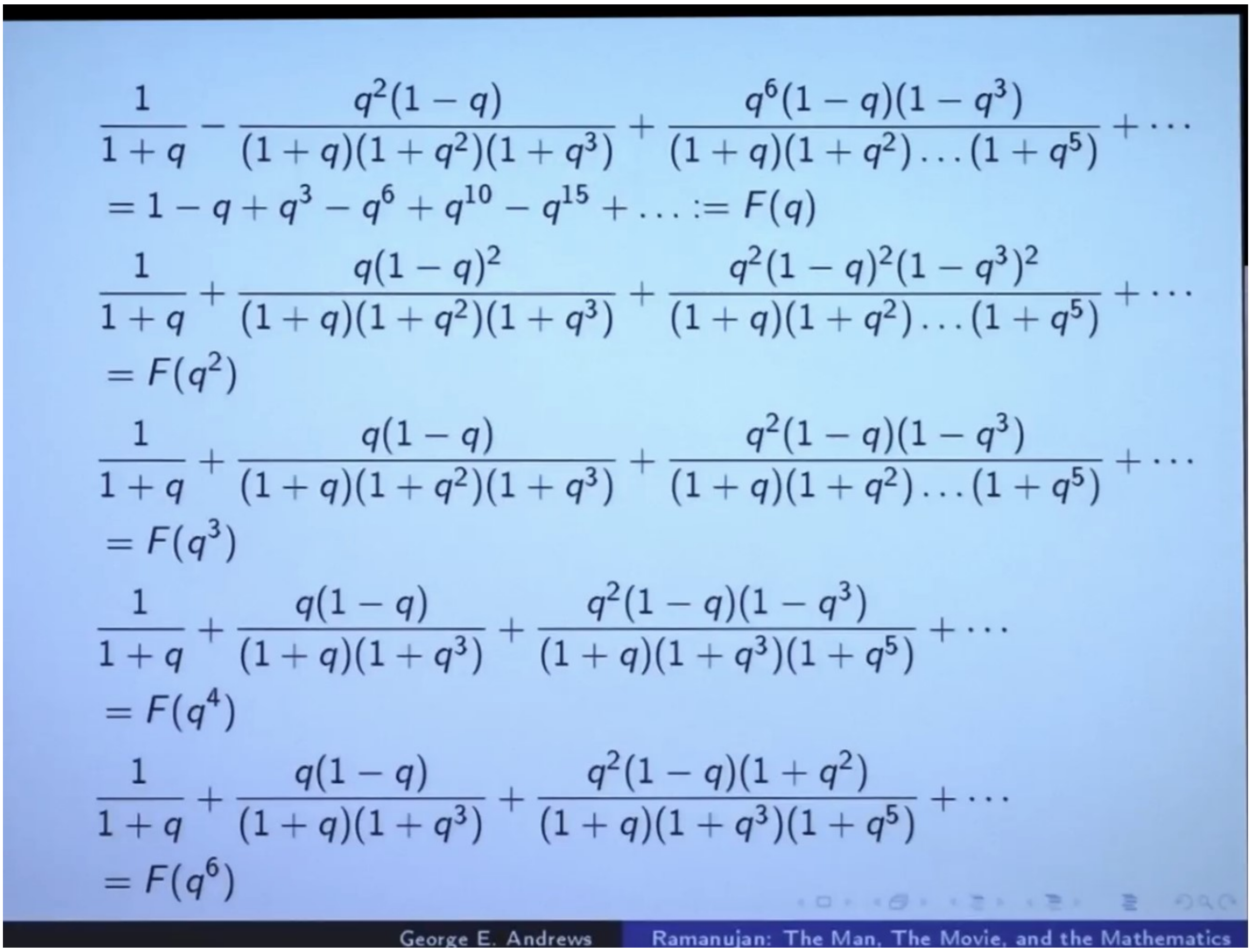


https://news.cnrs.fr/articles/ramanujan-the-man-who-knew-infinity

From:

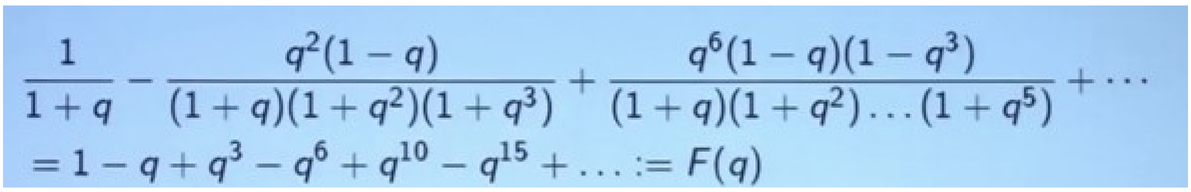
https://www.youtube.com/watch?v=IBWCm34QmjQ&t=1749s

"17Aug18 Professor George E. Andrews – Ramanujan: The Man, The Movie and the Mathematics"



For $q = e^{-2\pi i\tau}$ where $i\tau > 0$; $i\tau = 1$; $q = 0.0018674427317... \approx 0.00186744\dots$

(a)



(b)

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

(c)

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

(d)

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

(e)

$$\frac{1}{1+q}+\frac{q(1-q)}{(1+q)(1+q^3)}+\frac{q^2(1-q)(1+q^2)}{(1+q)(1+q^3)(1+q^5)}+\cdots$$
$$=F(q^6)$$

From (a)

$$\frac{1}{1+q}-\frac{q^2(1-q)}{(1+q)(1+q^2)(1+q^3)}+\frac{q^6(1-q)(1-q^3)}{(1+q)(1+q^2)\ldots(1+q^5)}+\cdots$$
$$=1-q+q^3-q^6+q^{10}-q^{15}+\ldots:=F(q)$$

we obtain, for q = 0.00186744:

1/(1+0.00186744) – (((0.00186744^2)(1-0.00186744)))/(((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3)))

Input interpretation:

$$\frac{1}{1+0.00186744}-\frac{0.00186744^2\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}$$

Result:

0.998132566512383472254757981308636609823513562654449979220...

0.9981325…

Partial Result

(((0.00186744^6(1-0.00186744)(1-0.00186744^3))))/((((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3)(1+0.00186744^4)(1+0.00186744^5))))

Input interpretation:

$$\left(0.00186744^6\,(1-0.00186744)\,(1-0.00186744^3)\right)/\left((1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)\,(1+0.00186744^4)\,(1+0.00186744^5)\right)$$

Result:

$4.225288642678099488038605980478471126711362554322726 7... \times 10^{-17}$

$4.225288642\ldots*10^{-17}$ Partial result

Thence:

Input interpretation:

$$\frac{1}{1+0.00186744}-\frac{0.00186744^2\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}+4.225288642678099488038605980478471126711362554322726 7\times 10^{-17}$$

Result:

0.998132566512383514507644408089631490209573367439161246333...

0.99813256651238… Final Result

This result is practically equal to the following Ramanujan generalized continued fraction:

$$\cfrac{1}{1+\cfrac{e^{-2\pi}}{1+\cfrac{e^{-4\pi}}{1+\cfrac{e^{-6\pi}}{1+\cdots}}}} = e^{2\pi/5}\left(\sqrt{\Phi\sqrt{5}}-\Phi\right) = 0,9981360456\ \ldots$$

e^(2Pi/5) (((sqrt((golden ratio)sqrt5)-golden ratio)))

Input:

$$e^{2\times\pi/5}\left(\sqrt{\phi\sqrt{5}}-\phi\right)$$

ϕ is the golden ratio

Exact result:

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

Decimal approximation:

0.998136044598509332150024459047074735311382994763043982185...

0.998136044598….

Property:

$e^{(2\pi)/5}\left(\sqrt[4]{5}\sqrt{\phi}-\phi\right)$ is a transcendental number

Alternate forms:

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

$$-\frac{1}{2}\left(1+\sqrt{5}-\sqrt[4]{5}\sqrt{2\left(1+\sqrt{5}\right)}\right)e^{(2\pi)/5}$$

$$\left(\frac{1}{2}\left(-1-\sqrt{5}\right)+\frac{\sqrt[4]{5}\sqrt{1+\sqrt{5}}}{\sqrt{2}}\right)e^{(2\pi)/5}$$

Continued fraction:

$$\cfrac{1}{1+\cfrac{1}{535+\cfrac{1}{2+\cfrac{1}{38+\cfrac{1}{10+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{42+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{2+\cfrac{1}{5+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\dots}}}}}}}}}}}}}}}}}}}}}}$$

Series representations:

$$e^{(2\pi)/5}\left(\sqrt{\phi\sqrt{5}}-\phi\right)=-e^{(2\pi)/5}\phi+e^{(2\pi)/5}\sqrt{-1+\phi\sqrt{5}}\sum_{k=0}^{\infty}\binom{\frac{1}{2}}{k}\left(-1+\phi\sqrt{5}\right)^{-k}$$

$$e^{(2\pi)/5}\left(\sqrt{\phi\sqrt{5}}-\phi\right)=-e^{(2\pi)/5}\phi+e^{(2\pi)/5}\sqrt{-1+\phi\sqrt{5}}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(-1+\phi\sqrt{5}\right)^{-k}}{k!}$$

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

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

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

$n!$ is the factorial function

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

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

From (b)

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

1/(1+0.00186744) + ((0.00186744(1-0.00186744)^2))/((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3)

Input interpretation:

$$\frac{1}{1+0.00186744}+\frac{0.00186744\,(1-0.00186744)^2}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}$$

Result:

0.999993038348366349082272561050573688109381291311847896576...

0.999993038348... Partial result

(((0.00186744^2(1-0.00186744)^2*(1-0.00186744^3)^2)))/((((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3)(1+0.00186744^4)(1+0.00186744^5))))

Input interpretation:

$$(0.00186744^2\,(1-0.00186744)^2\,(1-0.00186744^3)^2)/((1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)\,(1+0.00186744^4)\,(1+0.00186744^5))$$

Result:

3.4678313969234236753964573799127696371490912532034236... × 10^{-6}

3.4678313969…*10^{-6} partial result

Thence:

1/(1+0.00186744) + ((0.00186744(1-0.00186744)^2))/((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3))+3.4678313969234236753964573799127696371490912532034236 × 10^-6

Input interpretation:

$$\frac{1}{1+0.00186744} + \frac{0.00186744\,(1-0.00186744)^2}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)} + 3.4678313969234236753964573799127696371490912532034236 \times 10^{-6}$$

Result:

0.999996506179763272505947957507953600879018440403101100000...

0.9999965061797632.... Final Result

From (c)

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

1/(1+0.00186744)+(0.00186744(1-0.00186744))/((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3))+(0.00186744^2(1-0.00186744)(1-0.00186744^3))/((1+0.00186744)(1+0.00186744^2)(1+0.00186744^5))

Input interpretation:

$$\frac{1}{1+0.00186744}+\frac{0.00186744\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}+\frac{0.00186744^2\,(1-0.00186744)\,(1-0.00186744^3)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^5)}$$

Result:

0.999999986987417124730226028110134970079028870967751202815...

0.999999986987417124730......

From (d)

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

1/(1+0.00186744) + (0.00186744(1-0.00186744)) / ((1+0.00186744)(1+0.00186744^3)) + (0.00186744^2(1-0.00186744)(1-0.00186744^3)) / ((1+0.00186744)(1+0.00186744^3)(1+0.00186744^5))

Input interpretation:

$$\frac{1}{1+0.00186744}+\frac{0.00186744\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^3)}+\frac{0.00186744^2\,(1-0.00186744)\,(1-0.00186744^3)}{(1+0.00186744)\,(1+0.00186744^3)\,(1+0.00186744^5)}$$

Result:

0.999999993487593859233196962292120734929897206065448414039...

0.9999999934875938592 3......

From (e)

$$\frac{1}{1+q}+\frac{q(1-q)}{(1+q)(1+q^3)}+\frac{q^2(1-q)(1+q^2)}{(1+q)(1+q^3)(1+q^5)}+\cdots$$
$$=F(q^6)$$

1/(1+0.00186744) + (0.00186744(1-0.00186744))/((1+0.00186744)(1+0.00186744^3))+(0.00186744^2(1-0.00186744)(1+0.00186744^2))/((1+0.00186744)(1+0.00186744^3)(1+0.00186744^5))

Input interpretation:

$$\frac{1}{1+0.00186744}+\frac{0.00186744\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^3)}+\frac{0.00186744^2\,(1-0.00186744)\,(1+0.00186744^2)}{(1+0.00186744)\,(1+0.00186744^3)\,(1+0.00186744^5)}$$

Result:

0.9999999934997326338591021255171803225946933508095222400082...

0.9999999934997326338591.....

The sum of the five results is:

(0.99813256651238+0.9999965061797632+0.99999998698741712473+0.99999999348759385923+0.9999999934997326338591)

Input interpretation:

0.99813256651238 + 0.9999965061797632 + 0.99999998698741712473 + 0.99999999348759385923 + 0.9999999934997326338591

Result:

4.9981290466668868178191

4.9981290466668868178191

(0.99813256651238+0.9999965061797632+0.99999998698741712473+0.99999999348759385923+0.9999999934997326338591)^3+1/golden ratio

Input interpretation:

$$(0.99813256651238 + 0.9999965061797632 + 0.99999998698741712473 + 0.99999999348759385923 + 0.9999999934997326338591)^3 + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.47776498921...

125.477764…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

Alternative representations:

$$(0.998132566512380000 + 0.99999650617976320000 + 0.999999986987417124730000 + 0.999999993487593859230000 + 0.99999999349973263385910000)^3 + \frac{1}{\phi} = 4.99812904666688682^3 + \frac{1}{2\sin(54°)}$$

$$(0.998132566512380000 + 0.99999650617976320000 + 0.999999986987417124730000 + 0.999999993487593859230000 + 0.99999999349973263385910000)^3 + \frac{1}{\phi} = 4.99812904666688682^3 + -\frac{1}{2\cos(216°)}$$

$$(0.998132566512380000 + 0.99999650617976320000 + 0.999999986987417124730000 + 0.999999993487593859230000 + 0.99999999349973263385910000)^3 + \frac{1}{\phi} = 4.99812904666688682^3 + -\frac{1}{2\sin(666°)}$$

(0.99813256651238+0.9999965061797632+0.99999998698741712473+0.99999999348759385923+0.9999999934997326338591)^3+13+golden ratio

where 13 is a Fibonacci number

Input interpretation:

$$(0.99813256651238 + 0.9999965061797632 + 0.99999998698741712473 + 0.99999999348759385923 + 0.99999999349973263385 91)^3 + 13 + \phi$$

ϕ is the golden ratio

Result:

139.47776498921...

139.477764…. result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$(0.998132566512380000 + 0.999996506179763200000 + 0.999999986987417124730000 + 0.999999993487593859230000 + 0.999999993499732633859100000)^3 + 13 + \phi = 13 + 4.99812904666688682^3 + 2\sin(54°)$$

$$(0.998132566512380000 + 0.999996506179763200000 + 0.999999986987417124730000 + 0.999999993487593859230000 + 0.999999993499732633859100000)^3 + 13 + \phi = 13 - 2\cos(216°) + 4.99812904666688682^3$$

$$(0.998132566512380000 + 0.999996506179763200000 + 0.999999986987417124730000 + 0.999999993487593859230000 + 0.999999993499732633859100000)^3 + 13 + \phi = 13 + 4.99812904666688682^3 - 2\sin(666°)$$

The mean of the five results is:

(0.99813256651238+0.9999965061797632+0.99999998698741712473+0.99999999348759385923+0.9999999934997326338591)/5

Input interpretation:

$$\frac{1}{5}(0.99813256651238 + 0.9999965061797632 + 0.99999998698741712473 + 0.99999999348759385923 + 0.9999999934997326338591)$$

Result:

0.99962580933337736356382

Repeating decimal:

0.999625809333377363563820

0.999625809333377363563820

We know that:

Leaving aside the need for further contributions to the potential that are needed to comply with well–known bounds on the tensor–to–scalar ratio r [35], when combining in four dimensions a "hard" exponential with a "mild" term one stumbles on some amusing numerology. The values of $\widetilde{\gamma}$ translate indeed into the spectral index for primordial scalar perturbations, according to

$$n_S = \frac{\gamma^{(c)\,2} - 9\,\gamma_d{}^2}{\gamma^{(c)\,2} - 3\,\gamma_d{}^2}\,, \tag{8.22}$$

and $\frac{\gamma_d}{\gamma^{(c)}} = \frac{1}{12}$ would yield $n_S \simeq 0.96$. According to eq. (8.21), this result would obtain for $\alpha = 2$ and $p = 4$, *i.e.* for an NS five–brane wrapped around a small defect in the extra dimensions, which would make it effectively look like a four–dimensional extended object. This would be naturally available only for the $SO(16) \times SO(16)$ heterotic string of [9], which motivates us to take a closer look at dualities for these non–supersymmetric strings, starting from the original work in [41].

The scalar *spectral index* describes how the density fluctuations vary with scale. As the size of these fluctuations depends upon the inflaton's motion when these quantum fluctuations are becoming super-horizon sized, different inflationary potentials predict different spectral indices. These depend upon the slow roll parameters, in particular the gradient and curvature of the potential. Models such as monomial potentials predict a red spectral index $n_S < 1$. Planck provides a value of n_S of 0.96.

$n_S \cong 0.96$

From (c), we have that:

(((1/(1+0.00186744)+(0.00186744(1-0.00186744))/((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3))+(0.00186744^2 (1-0.00186744)(1-0.00186744^3))/((1+0.00186744)(1+0.00186744^2)(1+0.00186744^5)))))^2097152

Where 2097152 = $64^3 * 8$

Input interpretation:

$$\left(\frac{1}{1+0.00186744}+\frac{0.00186744\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}+\frac{0.00186744^2\,(1-0.00186744)\,(1-0.00186744^3)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^5)}\right)^{2097152}$$

Result:

0.973079626199252766745687805129759260286022723358251534260...

0.973079626199.....

From (a), we obtain:

((((1/(1+0.00186744) – (((0.00186744^2)(1-0.00186744)))/(((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3)))+4.2252886426780994880386059804784711267113625543227267 × 10^-17))))^24

Input interpretation:

$$\left(\frac{1}{1+0.00186744}-\frac{0.00186744^2\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}+4.2252886426780994880386059804784711267113625543227267\times 10^{-17}\right)^{24}$$

Result:

0.956131040598589094149566082593776598590362040483222440035...

0.95613104059....

Or:

((((1/(1+0.00186744) – (((0.00186744^2)(1-0.00186744)))/(((1+0.00186744)(1+0.00186744^2)(1+0.00186744^3)))+4.2252886426780994880386059804784711267113625543227267 × 10^-17))))^21

Input interpretation:

$$\left(\frac{1}{1+0.00186744}-\frac{0.00186744^2\,(1-0.00186744)}{(1+0.00186744)\,(1+0.00186744^2)\,(1+0.00186744^3)}+4.2252886426780994880386059804784711267113625543227267\times 10^{-17}\right)^{21}$$

Result:

0.961507642350613014002244052490243503931743205758750009026...

0.961507642350613.....

These three results are very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 and to the value of the following Rogers-Ramanujan continued fraction:

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

From the product of the inverse of the five results, we obtain:

(1/0.99813256651238*1/0.9999965061797632*1/0.99999998698741712473*1/0.999999999348759385923*1/0.99999999934997326338591)

Input interpretation:

$$\frac{1}{0.99813256651238}\times\frac{1}{0.9999965061797632}\times\frac{1}{0.99999998698741712473}\times\frac{1}{0.99999999348759385923}\times\frac{1}{0.99999999934997326338591}$$

Result:

1.001874453763139680583361610568262773169221365324011909621...

1.0018744537631.... result practically equal to the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{2\pi}{5}}}{\sqrt{\varphi\sqrt{5}-\varphi}}=1+\frac{e^{-2\pi}}{1+\frac{e^{-4\pi}}{1+\frac{e^{-6\pi}}{1+\frac{e^{-8\pi}}{1+\ldots}}}}\approx 1.0018674362$$

From which:

1/10^52[(1/0.99813256651238*1/0.9999965061797632*1/0.99999998698741712473*1/0.99999999348759385923*1/0.99999999349973263385 91)+10/10^2+(76*1/2)*1/10^4]

where 76 is a Lucas number

Input interpretation:

$$\frac{1}{10^{52}}\left(\frac{1}{0.99813256651238}\times\frac{1}{0.9999965061797632}\times\frac{1}{0.99999998698741712473}\times\frac{1}{0.99999999348759385923}\times\frac{1}{0.99999999349973263385 91}+\frac{10}{10^2}+\left(76\times\frac{1}{2}\right)\times\frac{1}{10^4}\right)$$

Result:

1.1056744537631396805833616105682627731692213653240119... × 10^{-52}

1.105674453...*10^{-52}

result practically equal to the value of Cosmological Constant 1.1056*10^{-52} m^{-2}

From (a)

$$\frac{1}{1+q} - \frac{q^2(1-q)}{(1+q)(1+q^2)(1+q^3)} + \frac{q^6(1-q)(1-q^3)}{(1+q)(1+q^2)\dots(1+q^5)} + \cdots$$
$$= 1 - q + q^3 - q^6 + q^{10} - q^{15} + \dots := F(q)$$

we obtain, for q = 0.5 :

1/(1+0.5) – (((0.5^2)(1-0.5)))/(((1+0.5)(1+0.5^2)(1+0.5^3)))+(((0.5^6(1-0.5)(1-0.5^3))))/ ((((1+0.5)(1+0.5^2)(1+0.5^5))))

Input:

$$\frac{1}{1+0.5} - \frac{0.5^2\,(1-0.5)}{(1+0.5)\,(1+0.5^2)\,(1+0.5^3)} + \frac{0.5^6\,(1-0.5)\,(1-0.5^3)}{(1+0.5)\,(1+0.5^2)\,(1+0.5^5)}$$

Result:

0.61094276094276094276094276094276094276094276094276094276094276O...

0.61094276…

From which:

1/10^52[1/(1+0.5) – (((0.5^2)(1-0.5)))/(((1+0.5)(1+0.5^2)(1+0.5^3)))+(((0.5^6(1-0.5)(1-0.5^3))))/ ((((1+0.5)(1+0.5^2)(1+0.5^5))))+(47+2)/10^2+47/10^4]

where 47 and 2 are Lucas numbers

Input:

$$\frac{1}{10^{52}}\left(\frac{1}{1+0.5} - \frac{0.5^2\,(1-0.5)}{(1+0.5)\,(1+0.5^2)\,(1+0.5^3)} + \frac{0.5^6\,(1-0.5)\,(1-0.5^3)}{(1+0.5)\,(1+0.5^2)\,(1+0.5^5)} + \frac{47+2}{10^2} + \frac{47}{10^4}\right)$$

Result:

$1.1056427609427609427609427609427609427609427609427609... \times 10^{-52}$

$1.1056427609... * 10^{-52}$

result practically equal to the value of Cosmological Constant $1.1056 * 10^{-52}$ m^{-2}

Note that:

Input interpretation:

0.610942760942760942760942760942760942760942760942760942760942760

Rational approximation:

$$\frac{109\,096\,921\,597\,139\,930\,287\,905\,828\,168\,194\,904\,420\,417\,804\,016\,025\,801}{178\,571\,428\,571\,785\,942\,659\,179\,007\,803\,548\,562\,209\,226\,165\,846\,016\,329}$$

Continued fraction:

$$\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{18+\cfrac{1}{18+\cfrac{1}{\dots}}}}}}}}$$

Possible closed forms:

$$\frac{3629\, w_{\mathrm{Wad}}}{1782} \approx 0.61094276094276094276094276094276094276094276094276094276094276$$

$$\frac{3629}{5940} \approx 0.61094276094276094276094276094276094276094276094276094276094276$$

$$\sqrt{\frac{1}{546}\left(-134 - 163\,e + 790\,\pi - 2454\log(2)\right)} \approx 0.6109427609427609424253 1$$

w_{Wad} is the Wadsworth constant

$\log(x)$ is the natural logarithm

From the following closed form

$$\sqrt{\frac{1}{546}(-134 - 163 e + 790 \pi - 2454 \log(2))} \approx 0.61094276094276094242531$$

we obtain:

sqrt((1/546(-134 -163e + (x+8)Pi - 2454log(2)))) = 0.61094276094276

Input interpretation:

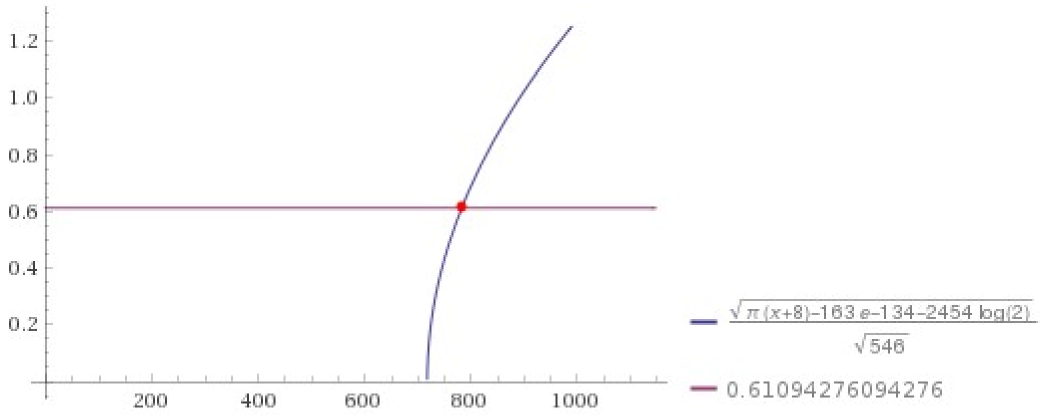
$$\sqrt{\frac{1}{546}(-134 - 163 e + (x+8) \pi - 2454 \log(2))} = 0.61094276094276$$

log(x) is the natural logarithm

Result:

$$\frac{\sqrt{\pi (x+8) - 163 e - 134 - 2454 \log(2)}}{\sqrt{546}} = 0.61094276094276$$

Plot:



Alternate form:

$$\frac{\sqrt{\pi x + 8 \pi - 163 e - 134 - 2454 \log(2)}}{\sqrt{546}} = 0.61094276094276$$

Alternate form assuming x is positive:

$$1.0000000000000 \sqrt{\pi (x+8) - 163 e - 2 (67 + 1227 \log(2))} = 14.275681321850$$

Solution:

$$x = \frac{\frac{1986437731}{5880600} + 163 e + 2454 \log(2)}{\pi} - 8$$

Input:

$$-8+\frac{\frac{1986437731}{5880600}+163\,e+2454\log(2)}{\pi}$$

log(x) is the natural logarithm

Decimal approximation:

782.0000000000000007127438241363853628048565606291673660...

782

From which:

-8 + (1986437731/5880600 + 163 e + 2454 log(2))/π + 1/golden ratio

where 8 is a Fibonacci number

Input:

$$-8+\frac{\frac{1986437731}{5880600}+163\,e+2454\log(2)}{\pi}+\frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Decimal approximation:

782.6180339887498949194789692480041743982059652404349302281...

782.6180339887.... result practically equal to the rest mass of Omega meson 782.65

sqrt((1/546(-(x-5) -163e + 790Pi - 2454log(2)))) = 0.61094276094276

Input interpretation:

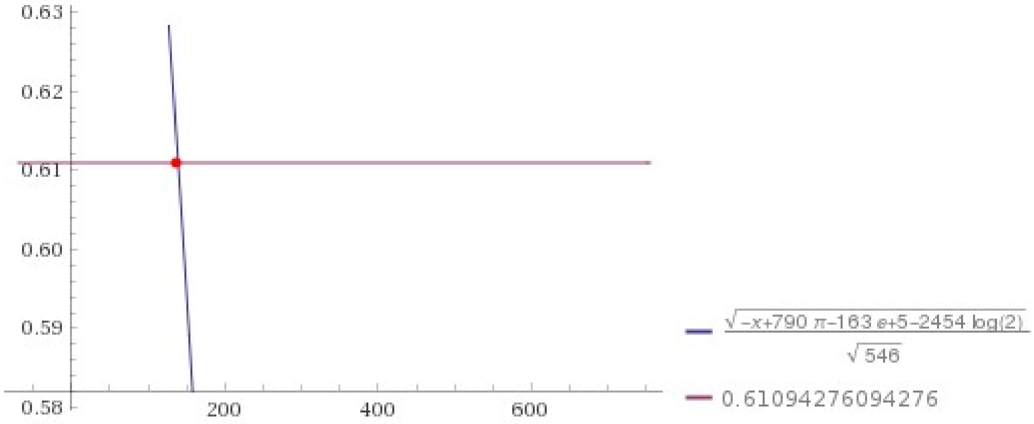
$$\sqrt{\frac{1}{546}\left(-(x-5)-163\,e+790\,\pi-2454\log(2)\right)}=0.61094276094276$$

log(x) is the natural logarithm

Result:

$$\frac{\sqrt{-x + 790\pi - 163e + 5 - 2454\log(2)}}{\sqrt{546}} = 0.61094276094276$$

Plot:



Alternate form assuming x is positive:

$$1.0000000000000\sqrt{-x + 790\pi - 163e + 5 - 2454\log(2)} = 14.275681321850$$

Solution:

$$x = -\frac{1169034331}{5880600} - 163e + 790\pi - 2454\log(2)$$

from which:

-1169034331/5880600 - 163 e + 790 π - 2454 log(2) + 1/golden ratio

Input:

$$-\frac{1169034331}{5880600} - 163e + 790\pi - 2454\log(2) + \frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Decimal approximation:

139.6180339887498946242895106545292567181078757323973035890...

139.6180339887… result practically equal to the rest mass of Pion meson 139.57 MeV sqrt((1/546(-(x+9) -163e + 790Pi - 2454log(2)))) = 0.61094276094276

Input interpretation:

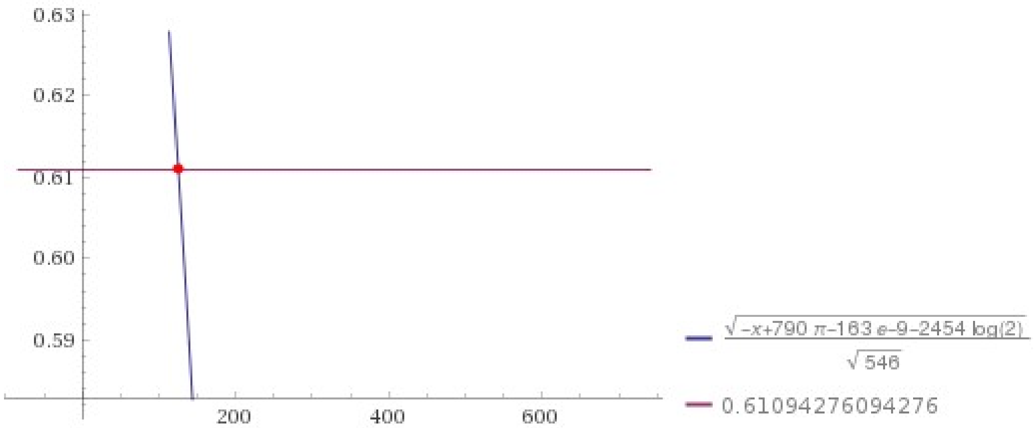
$$\sqrt{\frac{1}{546}\left(-(x+9) - 163\, e + 790\, \pi - 2454 \log(2)\right)} = 0.61094276094276$$

log(x) is the natural logarithm

Result:

$$\frac{\sqrt{-x + 790\, \pi - 163\, e - 9 - 2454 \log(2)}}{\sqrt{546}} = 0.61094276094276$$

Plot:



Alternate form assuming x is positive:

$$1.0000000000000 \sqrt{-x + 790\, \pi - 163\, e - 9 - 2454 \log(2)} = 14.275681321850$$

Solution:

$$x = -\frac{1251362731}{5880600} - 163\, e + 790\, \pi - 2454 \log(2)$$

From which:

-1251362731/5880600 - 163 e + 790 π - 2454 log(2) +1/golden ratio

Input:

$$-\frac{1251362731}{5880600} - 163\, e + 790\, \pi - 2454 \log(2) + \frac{1}{\phi}$$

log(x) is the natural logarithm

ϕ is the golden ratio

Decimal approximation:

125.61803398874989462428951065452925671810787573239730358 90...

125.6180339887…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

sqrt((1/546(-134 -163e + 790Pi - xlog(2)))) = 0.61094276094276

Input interpretation:

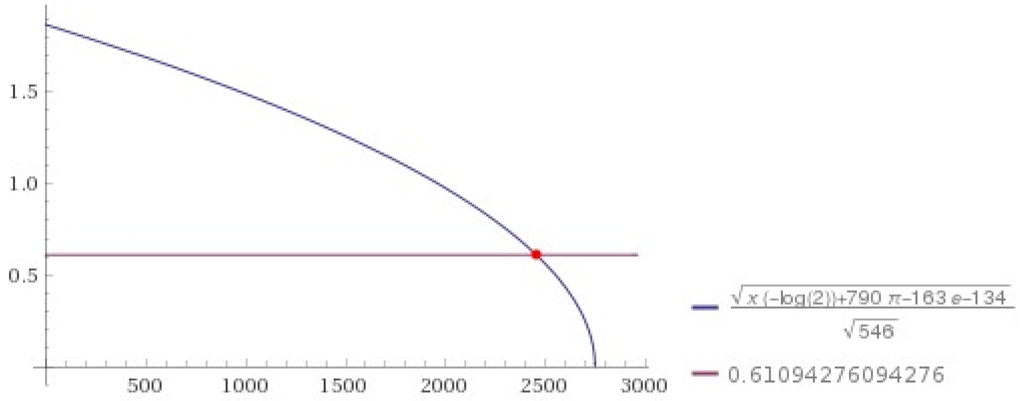
$$\sqrt{\frac{1}{546}(-134 - 163\,e + 790\,\pi - x\log(2))} = 0.61094276094276$$

log(x) is the natural logarithm

Result:

$$\frac{\sqrt{x(-\log(2)) + 790\,\pi - 163\,e - 134}}{\sqrt{546}} = 0.61094276094276$$

Plot:



Alternate form assuming x is positive:

$$1.0000000000000\sqrt{x(-\log(2)) + 790\,\pi - 163\,e - 134} = 14.275681321850$$

Solution:

$$x = -\frac{1986437731}{5880600\log(2)} - \frac{163\,e}{\log(2)} + \frac{790\,\pi}{\log(2)}$$

From which:

-1986437731/(5880600 log(2)) - (163 e)/log(2) + (790 π)/log(2)

Input:

$$-\frac{1986437731}{5880600\log(2)} - \frac{163\,e}{\log(2)} + \frac{790\,\pi}{\log(2)}$$

log(x) is the natural logarithm

Decimal approximation:

2453.999999999999999676958830015075595463146427666000831332...

2453.9999…. result practically equal to the rest mass of charmed Sigma baryon 2453.74

sqrt((1/546(-134 -163e + 790Pi - (2x-5)log(2)))) = 0.61094276094276

Input interpretation:

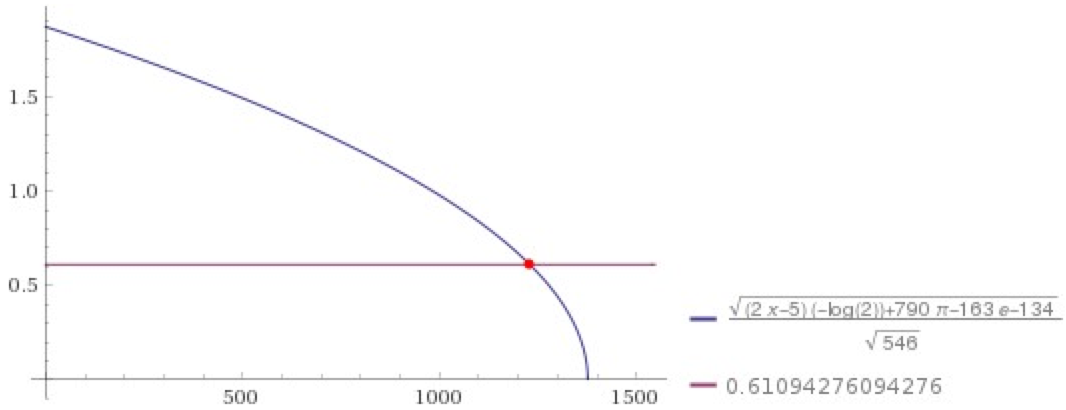
$$\sqrt{\frac{1}{546}\left(-134 - 163\,e + 790\,\pi - (2\,x - 5)\log(2)\right)} = 0.61094276094276$$

log(x) is the natural logarithm

Result:

$$\frac{\sqrt{(2\,x - 5)(-\log(2)) + 790\,\pi - 163\,e - 134}}{\sqrt{546}} = 0.61094276094276$$

Plot:



Alternate forms:

$$\frac{\sqrt{x(-\log(4)) + 790\pi - 163e - 134 + \log(32)}}{\sqrt{546}} = 0.61094276094276$$

$$\frac{\sqrt{-2x\log(2) + 790\pi - 163e - 134 + 5\log(2)}}{\sqrt{546}} = 0.61094276094276$$

Alternate form assuming x is positive:

$$1.0000000000000\sqrt{x(-\log(4)) + 790\pi - 163e - 134 + \log(32)} = 14.275681321850$$

Solution:

$$x = \frac{5}{2} - \frac{1986437731}{11761200\log(2)} + \frac{395\pi}{\log(2)} - \frac{163e}{\log(4)}$$

From which:

5/2 - 1986437731/(11761200 log(2)) + (395 π)/log(2) - (163 e)/log(4) + golden ratio^2

Input:

$$\frac{5}{2} - \frac{1986437731}{11761200\log(2)} + \frac{395\pi}{\log(2)} - \frac{163e}{\log(4)} + \phi^2$$

log(x) is the natural logarithm

ϕ is the golden ratio

Decimal approximation:

1232.118033988749894686684001841903435849293523012806178528...

1232.1180339887….result practically equal to the rest mass of Delta baryon 1232

sqrt((1/546(-134 -163e + 790Pi - (x+521+199)log(2)))) = 0.61094276094276

where 521 and 199 are Lucas numbers

Input interpretation:

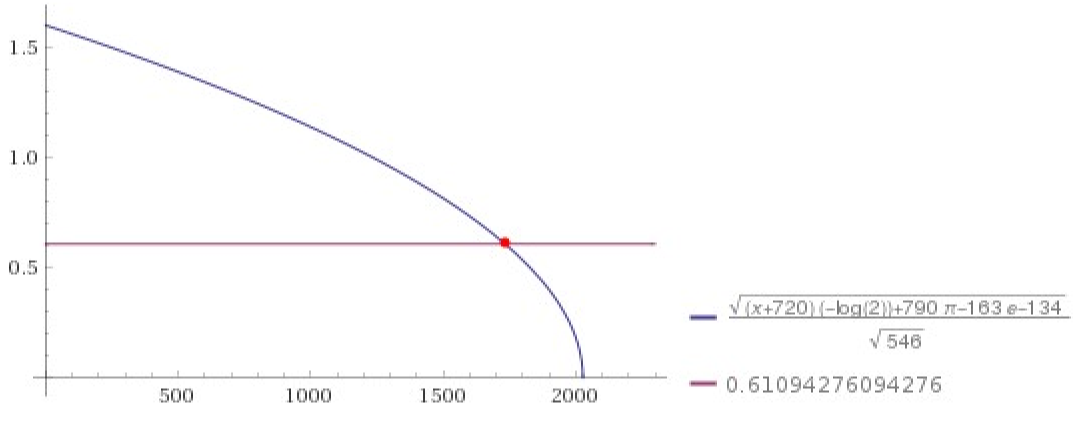
$$\sqrt{\frac{1}{546}(-134 - 163 e + 790 \pi - (x + 521 + 199) \log(2))} = 0.61094276094276$$

log(x) is the natural logarithm

Result:

$$\frac{\sqrt{(x + 720)(-\log(2)) + 790 \pi - 163 e - 134}}{\sqrt{546}} = 0.61094276094276$$

Plot:



Alternate form:

$$\frac{\sqrt{x(-\log(2)) + 790 \pi - 163 e - 134 - 720 \log(2)}}{\sqrt{546}} = 0.61094276094276$$

Alternate form assuming x is positive:

$$1.0000000000000 \sqrt{(x + 720)(-\log(2)) + 790 \pi - 163 e - 134} = 14.27568132185$$

Solution:

$$x = -720 - \frac{1986437731}{5880600 \log(2)} - \frac{163 e}{\log(2)} + \frac{790 \pi}{\log(2)}$$

From which:

-720 - 1986437731/(5880600 log(2)) - (163 e)/log(2) + (790 π)/log(2) – 5

where 5 is a Fibonacci number

Input:

$$-720 - \frac{1986437731}{5880600 \log(2)} - \frac{163 e}{\log(2)} + \frac{790 \pi}{\log(2)} - 5$$

log(x) is the natural logarithm

Exact result:

$$-725 - \frac{1986437731}{5880600 \log(2)} - \frac{163 e}{\log(2)} + \frac{790 \pi}{\log(2)}$$

Decimal approximation:

1728.999999999999996769588300150755954631464276660008313 32...

1728.9999….

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

From the following closed form:

$$\frac{3629 \, w_{\text{Wad}}}{1782} \approx$$
0.61094276094276094276094276094276094276094276094276094276

we obtain:

3629*(3/10)*1/1782   where $W_{Wad} = 3/10$

Input:

$$3629 \times \frac{3}{10} \times \frac{1}{1782}$$

Exact result:

$$\frac{3629}{5940}$$

Decimal approximation:

0.610942760942760942760942760942760942760942760942760942760...

3629*(3/10)*1/x = 0.610942760942769

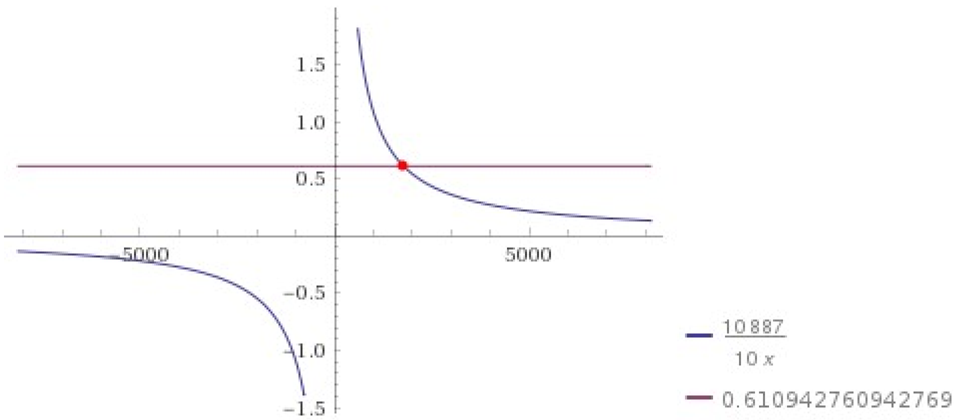
Input interpretation:

$$3629 \times \frac{3}{10} \times \frac{1}{x} = 0.610942760942769$$

Result:

$$\frac{10887}{10x} = 0.610942760942769$$

Plot:



Alternate form assuming x is real:

$$\frac{1781.99999999998}{x} = 1.00000000000000$$

Alternate form assuming x is positive:

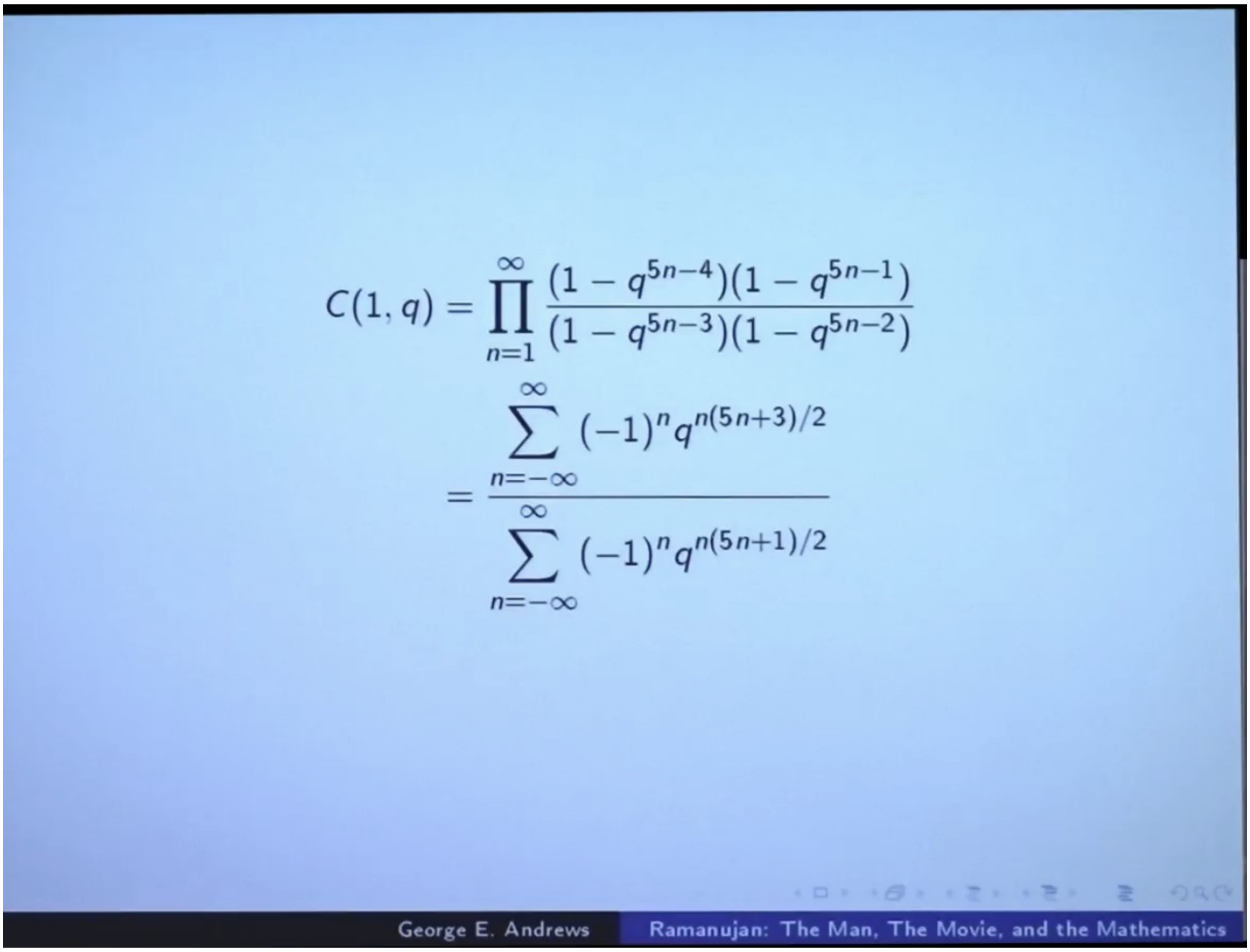
$$1.00000000000000\,x = 1781.99999999998 \quad (\text{for } x \neq 0)$$

Solution:

$x \approx 1782.0000000000$

1782 result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

We have that:



For q = 0.5, and n = 2, we obtain:

((((-1)^2 * 0.5^(((2((5*2+3)/2))))))) / ((((-1)^2 * 0.5^(((2((5*2+1)/2)))))))

Input:

$$\frac{(-1)^2 \times 0.5^{2\,(1/2\,(5\times 2+3))}}{(-1)^2 \times 0.5^{2\,(1/2\,(5\times 2+1))}}$$

Result:

0.25

0.25

Rational form:

$$\frac{1}{4}$$

For n = 3, we obtain:

((((-1)^3 * 0.5^(((3((5*3+3)/2))))))) / ((((-1)^3 * 0.5^(((3((5*3+1)/2)))))))

Input:

$$\frac{(-1)^3 \times 0.5^{3\,(1/2\,(5\times 3+3))}}{(-1)^3 \times 0.5^{3\,(1/2\,(5\times 3+1))}}$$

Result:

0.125

0.125

Rational form:

$$\frac{1}{8}$$

We take n = 3 and obtain:

2*(((1/[((((-1)^3 * 0.5^(((3((5*3+3)/2))))))) / ((((-1)^3 * 0.5^(((3((5*3+1)/2)))))))]^2)))-3+1/golden ratio

where 3 is a Fibonacci number

Input:

$$2 \times \frac{1}{\left(\frac{(-1)^3 \times 0.5^{3\,(1/2\,(5\times 3+3))}}{(-1)^3 \times 0.5^{3\,(1/2\,(5\times 3+1))}}\right)^2} - 3 + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.618...

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

Alternative representations:

$$\frac{2}{\left(\frac{(-1)^3\,0.5^{3/2\,(5\times 3+3)}}{(-1)^3\,0.5^{3/2\,(5\times 3+1)}}\right)^2} - 3 + \frac{1}{\phi} = -3 + \frac{2}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2} + \frac{1}{2\sin(54\,°)}$$

$$\frac{2}{\left(\frac{(-1)^3\,0.5^{3/2\,(5\times 3+3)}}{(-1)^3\,0.5^{3/2\,(5\times 3+1)}}\right)^2} - 3 + \frac{1}{\phi} = -3 + -\frac{1}{2\cos(216\,°)} + \frac{2}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}$$

$$\frac{2}{\left(\frac{(-1)^3\,0.5^{3/2\,(5\times 3+3)}}{(-1)^3\,0.5^{3/2\,(5\times 3+1)}}\right)^2} - 3 + \frac{1}{\phi} = -3 + \frac{2}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2} + -\frac{1}{2\sin(666\,°)}$$

And:

2*(((1/[(((((-1)^3 * 0.5^(((3((5*3+3)/2))))))) / ((((-1)^3 * 0.5^(((3((5*3+1)/2)))))))]^2)))+11+1/golden ratio

where 11 is a Lucas number

Input:

$$2\times\frac{1}{\left(\frac{(-1)^3\times 0.5^{3\,(1/2\,(5\times 3+3))}}{(-1)^3\times 0.5^{3\,(1/2\,(5\times 3+1))}}\right)^2} + 11 + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.618...

139.618… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$\frac{2}{\left(\frac{(-1)^3\, 0.5^{3/2\,(5\times 3+3)}}{(-1)^3\, 0.5^{3/2\,(5\times 3+1)}}\right)^2}+11+\frac{1}{\phi}=11+\frac{2}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}+\frac{1}{2\sin(54\,°)}$$

$$\frac{2}{\left(\frac{(-1)^3\, 0.5^{3/2\,(5\times 3+3)}}{(-1)^3\, 0.5^{3/2\,(5\times 3+1)}}\right)^2}+11+\frac{1}{\phi}=11+-\frac{1}{2\cos(216\,°)}+\frac{2}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}$$

$$\frac{2}{\left(\frac{(-1)^3\, 0.5^{3/2\,(5\times 3+3)}}{(-1)^3\, 0.5^{3/2\,(5\times 3+1)}}\right)^2}+11+\frac{1}{\phi}=11+\frac{2}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}+-\frac{1}{2\sin(666\,°)}$$

27*(((1/[((((-1)^3 * 0.5^(((3((5*3+3)/2))))))) / ((((-1)^3 * 0.5^(((3((5*3+1)/2)))))))]^2)))+1/golden ratio

where 27 is equal to √729

Input:

$$27\times\frac{1}{\left(\frac{(-1)^3\times 0.5^{3\,(1/2\,(5\times 3+3))}}{(-1)^3\times 0.5^{3\,(1/2\,(5\times 3+1))}}\right)^2}+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

1728.618033988749894848204586834365638117720309179805762862...

1728.6180339887…

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

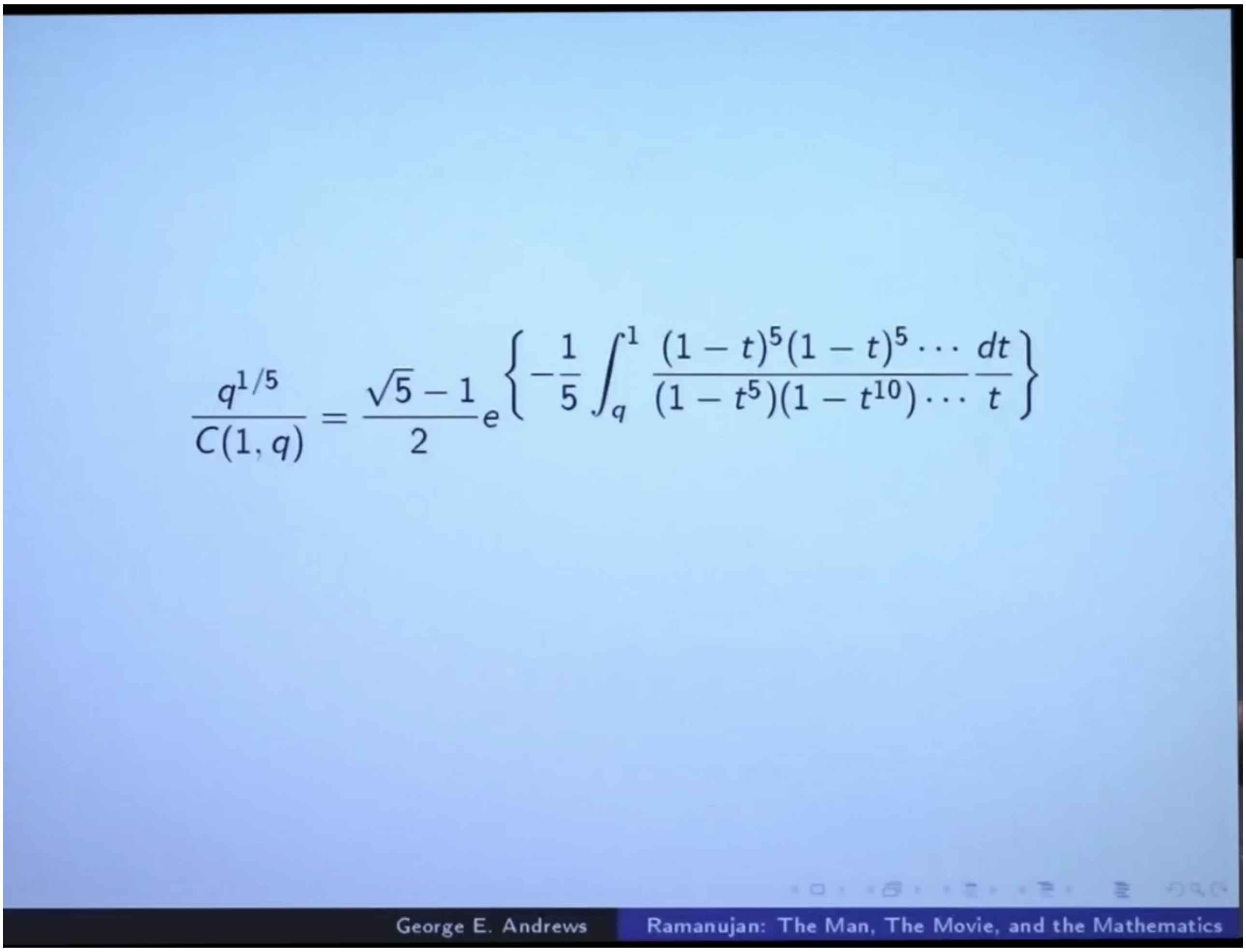
Alternative representations:

$$\frac{27}{\left(\frac{(-1)^3\, 0.5^{3/2\,(5\times 3+3)}}{(-1)^3\, 0.5^{3/2\,(5\times 3+1)}}\right)^2}+\frac{1}{\phi}=\frac{27}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}+\frac{1}{2\sin(54\,°)}$$

$$\frac{27}{\left(\frac{(-1)^3\, 0.5^{3/2\,(5\times 3+3)}}{(-1)^3\, 0.5^{3/2\,(5\times 3+1)}}\right)^2}+\frac{1}{\phi}=-\frac{1}{2\cos(216\,°)}+\frac{27}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}$$

$$\frac{27}{\left(\frac{(-1)^3\, 0.5^{3/2\,(5\times 3+3)}}{(-1)^3\, 0.5^{3/2\,(5\times 3+1)}}\right)^2}+\frac{1}{\phi}=\frac{27}{\left(\frac{-0.5^{27}}{-0.5^{24}}\right)^2}+-\frac{1}{2\sin(666\,°)}$$

We have that:



For q = 0.5 and C(1, q) = 0.125, we obtain:

0.5^(1/5) / 0.125

Input:

$$\frac{\sqrt[5]{0.5}}{0.125}$$

Result:

6.964404506368993113090160139837968791833003394784024385934...

6.9644045063689….

From which:

(((0.5^(1/5) / 0.125))) = [1/2(sqrt5-1)]e^x

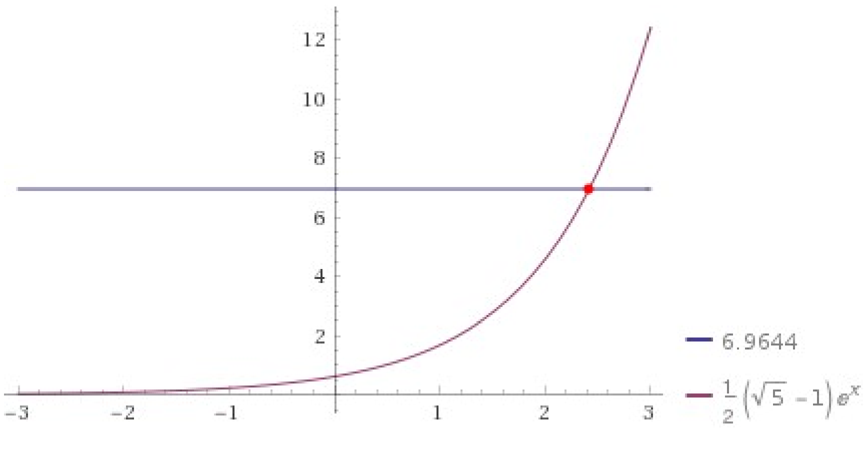
Input:

$$\frac{\sqrt[5]{0.5}}{0.125} = \left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)e^x$$

Result:

$$6.9644 = \frac{1}{2}\left(\sqrt{5}-1\right)e^x$$

Plot:



Alternate form:

$e^x = 11.2686$

Alternate form assuming x is positive:

$e^x = 11.2686$

Expanded form:

$$6.9644 = \frac{\sqrt{5}\ e^x}{2} - \frac{e^x}{2}$$

Real solution:

$x \approx 2.42202$

2.42202

Solution:

$x \approx i\,(6.28319\,n + (-2.42202\,i))\,, \quad n \in \mathbb{Z}$

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

Thence:

$$-\frac{1}{5}\int_q^1 \frac{(1-t)^5(1-t)^5 \ldots}{(1-t)^5(1-t)^{10} \ldots}\frac{dt}{t} = 2.42202$$

Indeed:

[1/2(sqrt5-1)]e^(2.42202)

Input interpretation:

$\left(\frac{1}{2}\left(\sqrt{5}-1\right)\right)e^{2.42202}$

Result:

6.964377131943264659382763889136746065135256464569946022273...

6.9643771319….

Series representations:

$$\frac{1}{2} e^{2.42202} \left(\sqrt{5} - 1\right) = -\frac{e^{2.42202}}{2} + \frac{1}{2} e^{2.42202} \sqrt{4} \sum_{k=0}^{\infty} 4^{-k} \binom{\frac{1}{2}}{k}$$

$$\frac{1}{2} e^{2.42202} \left(\sqrt{5} - 1\right) = -\frac{e^{2.42202}}{2} + \frac{1}{2} e^{2.42202} \sqrt{4} \sum_{k=0}^{\infty} \frac{\left(-\frac{1}{4}\right)^k \left(-\frac{1}{2}\right)_k}{k!}$$

$$\frac{1}{2} e^{2.42202} \left(\sqrt{5} - 1\right) = -\frac{e^{2.42202}}{2} + \frac{e^{2.42202} \sum_{j=0}^{\infty} \operatorname{Res}_{s=-\frac{1}{2}+j} 4^{-s} \, \Gamma\left(-\frac{1}{2} - s\right) \Gamma(s)}{4 \sqrt{\pi}}$$

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

$n!$ is the factorial function

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

$\Gamma(x)$ is the gamma function

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

Now, we have that:

(((0.5^(1/5) / 0.125)))^4 + 76 + 29 - golden ratio^3

where 76 and 29 are Lucas numbers

Input:

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 + 76 + 29 - \phi^3$$

ϕ is the golden ratio

Result:

2453.30...

2453.30… result practically equal to the rest mass of charmed Sigma baryon 2453.74

Alternative representations:

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 + 76 + 29 - \phi^3 = 105 + \left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 - (2\sin(54°))^3$$

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 + 76 + 29 - \phi^3 = 105 - (-2\cos(216°))^3 + \left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4$$

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 + 76 + 29 - \phi^3 = 105 + \left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 - (-2\sin(666°))^3$$

(((0.5^(1/5) / 0.125)))^4 - 521-76-29+golden ratio

where 521 is a Lucas number

Input:

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 - 521 - 76 - 29 + \phi$$

ϕ is the golden ratio

Result:

1728.15...

1728.15…

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

Alternative representations:

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 - 521 - 76 - 29 + \phi = -626 + \left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 + 2\sin(54°)$$

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 - 521 - 76 - 29 + \phi = -626 + 2\cos\left(\frac{\pi}{5}\right) + \left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4$$

$$\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4 - 521 - 76 - 29 + \phi = -626 - 2\cos(216°) + \left(\frac{\sqrt[5]{0.5}}{0.125}\right)^4$$

1/2(((0.5^(1/5) / 0.125)))^3 - 29 - 1/golden ratio

where 29 is a Lucas number

Input:

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 29 - \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.279...

139.279… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 29 - \frac{1}{\phi} = -29 + \frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - \frac{1}{2\sin(54°)}$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 29 - \frac{1}{\phi} = -29 - -\frac{1}{2\cos(216°)} + \frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 29 - \frac{1}{\phi} = -29 + \frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - -\frac{1}{2\sin(666°)}$$

1/2(((0.5^(1/5) / 0.125)))^3 - 47 + Pi + 1/golden ratio

where 47 is a Lucas number

Input:

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.657...

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

Alternative representations:

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = -47 + \pi + -\frac{1}{2\cos(216\,°)} + \frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = -47 + \pi + \frac{1}{2\cos\left(\frac{\pi}{5}\right)} + \frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = -47 + 180\,° + -\frac{1}{2\cos(216\,°)} + \frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3$$

Series representations:

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = 121.897 + \frac{1}{\phi} + 4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = 119.897 + \frac{1}{\phi} + 2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = 121.897 + \frac{1}{\phi} + \sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

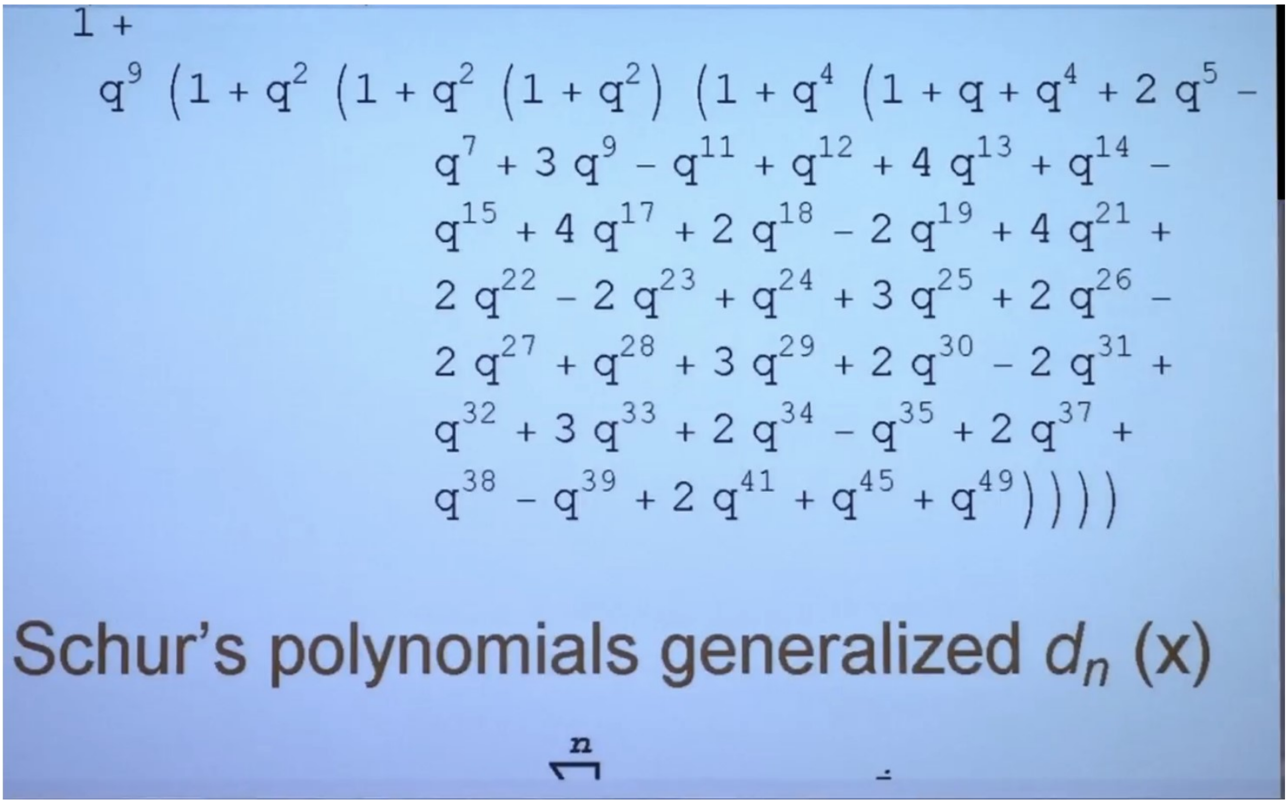
Integral representations:

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = 121.897 + \frac{1}{\phi} + 2\int_0^{\infty} \frac{1}{1+t^2}\,dt$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = 121.897 + \frac{1}{\phi} + 4\int_0^{1} \sqrt{1-t^2}\,dt$$

$$\frac{1}{2}\left(\frac{\sqrt[5]{0.5}}{0.125}\right)^3 - 47 + \pi + \frac{1}{\phi} = 121.897 + \frac{1}{\phi} + 2\int_0^{\infty} \frac{\sin(t)}{t}\,dt$$

Now, we have that:



For q = 0.5, we obtain:

1+0.5^9(1+0.5^2(1+0.5^2(1+0.5^2)(1+0.5^4(1+0.5+0.5^4+2*0.5^5-0.5^7+3*0.5^9-0.5^11+0.5^12+4*0.5^13+0.5^14-0.5^15+4*0.5^17+2*0.5^18-2*0.5^19+4*0.5^21+2*0.5^22-2*0.5^23+0.5^24+3*0.5^25+2*0.5^26-2*0.5^27+0.5^28+3*0.5^29+2*0.5^30-2*0.5^31+0.5^32+3*0.5^33+2*0.5^34-0.5^35+2*0.5^37+0.5^38-0.5^39+2*0.5^41+0.5^45+0.5^49)))) =

= 1.002609475690709

((1+0.5^9(1+0.5^2(1+0.5^2(1+0.5^2)(1+0.5^4(1+0.5+0.5^4+2*0.5^5-0.5^7+3*0.5^9-0.5^11+0.5^12+4*0.5^13+0.5^14-0.5^15+4*0.5^17+2*0.5^18)-6.1353084976900618 × 10^-6)))))

Input interpretation:

$$1+0.5^9\left(1+0.5^2\left(1+0.5^2\left(1+0.5^2\right)\left(1+0.5^4\left(1+0.5+0.5^4+2\times0.5^5-0.5^7+3\times0.5^9-0.5^{11}+0.5^{12}+4\times0.5^{13}+0.5^{14}-0.5^{15}+4\times0.5^{17}+2\times0.5^{18}\right)-6.1353084976900618\times10^{-6}\right)\right)\right)$$

Result:

1.0026094747687839490719700927734375

1.00260947476… result near to the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{2\pi}{5}}}{\sqrt{\varphi\sqrt{5}-\varphi}}=1+\cfrac{e^{-2\pi}}{1+\cfrac{e^{-4\pi}}{1+\cfrac{e^{-6\pi}}{1+\cfrac{e^{-8\pi}}{1+\ldots}}}}\approx 1.0018674362$$

and:

1/(((((1+0.5^9(1+0.5^2(1+0.5^2(1+0.5^2)(1+0.5^4(1+0.5+0.5^4+2*0.5^5-0.5^7+3*0.5^9-0.5^11+0.5^12+4*0.5^13+0.5^14-0.5^15+4*0.5^17+2*0.5^18)-6.1353084976900618 × 10^-6)))))))^16

Input interpretation:

$$1/\left(1+0.5^9\left(1+0.5^2\left(1+0.5^2\left(1+0.5^2\right)\left(1+0.5^4\left(1+0.5+0.5^4+2\times0.5^5-0.5^7+3\times0.5^9-0.5^{11}+0.5^{12}+4\times0.5^{13}+0.5^{14}-0.5^{15}+4\times0.5^{17}+2\times0.5^{18}\right)-6.1353084976900618\times10^{-6}\right)\right)\right)\right)^{16}$$

Result:

0.959160154944736681097552698173659147572693523282288390554...

0.959160154...

result very near to the spectral index n_s , to the mesonic Regge slope, to the inflaton value at the end of the inflation 0.9402 (see Appendix) and to the value of the following Rogers-Ramanujan continued fraction:

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

From:

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

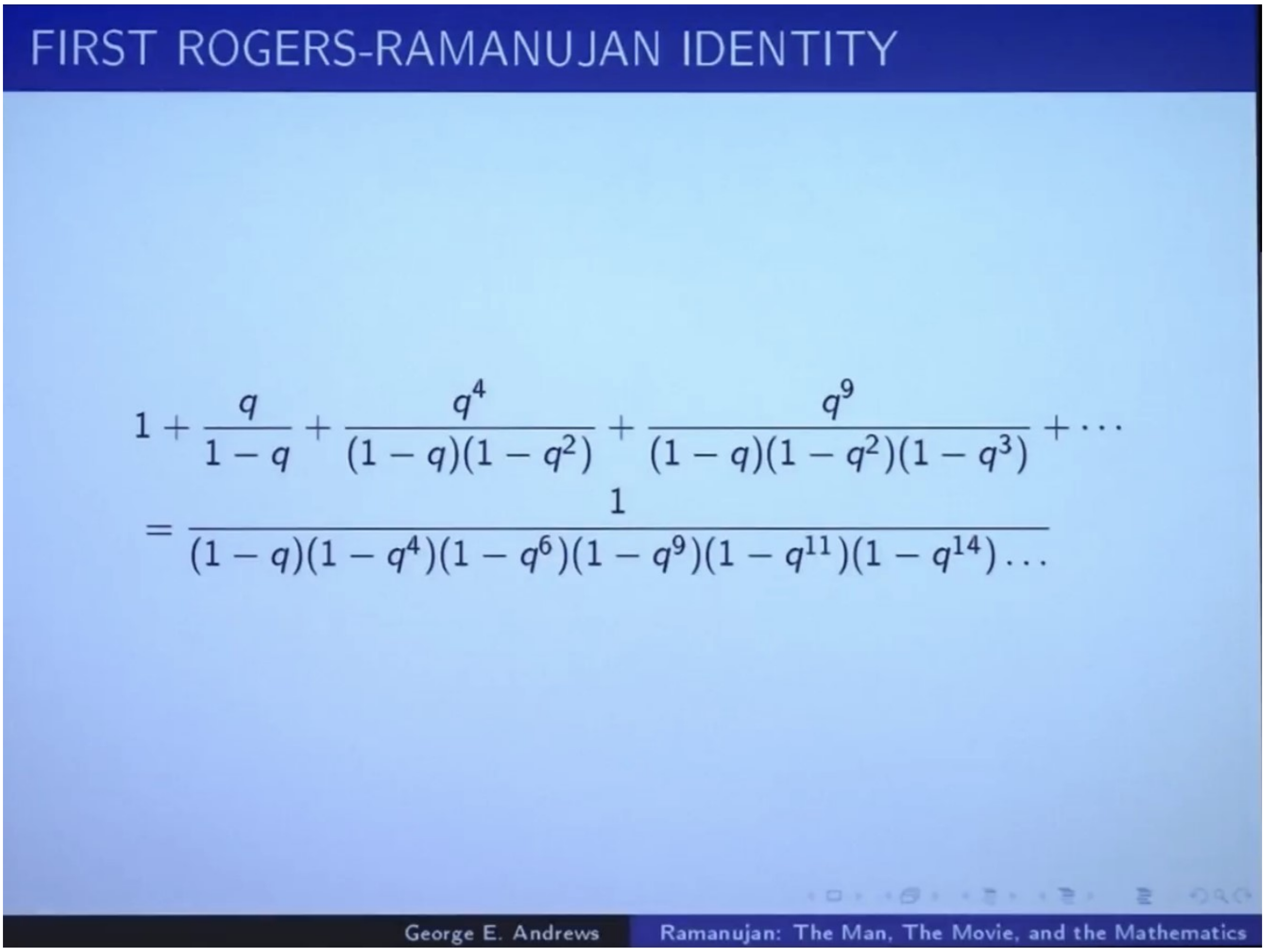
The primordial fluctuations are consistent with Gaussian purely adiabatic scalar perturbations characterized by a power spectrum with a spectral index n_s = 0.965 ± 0.004, consistent with the predictions of slow-roll, single-field, inflation.

We know that α' is the Regge slope (string tension). With regard the Omega mesons, the values are:

ω	6	$m_{u/d} = 0-60$	$0.910-0.918$
ω/ω_3	$5+3$	$m_{u/d} = 255-390$	$0.988-1.18$

ω/ω_3	$5+3$	$m_{u/d} = 240 - 345$	$0.937 - 1.000$

Now, we have that:



For q = 0.5, we obtain:

1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2)))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3)))

Input:

$$1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}$$

Result:

2.172619047619047619047619047619047619047619047619047619047...

2.172619047619….

Repeating decimal:

$2.172\overline{619047}$ (period 6)

1/10^27[(((1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2)))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3))))))-0.5]

Input:

$$\frac{1}{10^{27}}\left(\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)-0.5\right)$$

Result:

$1.672619047619047619047619047619047619047619047619047619047619047 6... \times 10^{-27}$

1.6726190476….*10^{-27} result practically equal to the proton mass in kg

1/(((1-0.5)(1-0.5^4)(1-0.5^6)(1-0.5^9)(1-0.5^11)(1-0.5^14)))

Input:

$$\frac{1}{(1-0.5)(1-0.5^4)(1-0.5^6)(1-0.5^9)(1-0.5^{11})(1-0.5^{14})}$$

Result:

2.172630251495238135758789364550058170203006240173576954257...

2.172630251495….

1/10^27[1/(((1-0.5)(1-0.5^4)(1-0.5^6)(1-0.5^9)(1-0.5^11)(1-0.5^14)))-0.5]

Input:

$$\frac{1}{10^{27}}\left(\frac{1}{(1-0.5)(1-0.5^4)(1-0.5^6)(1-0.5^9)(1-0.5^{11})(1-0.5^{14})}-0.5\right)$$

Result:

$1.672630251495238135758789364550058170203006240173576 9\ldots \times 10^{-27}$

$1.672630251495238\ldots*10^{-27}$ result practically equal to the proton mass in kg

We have also that:

(((1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^6+34+1/golden ratio

where 34 is a Fibonacci number

Input:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+34+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

139.790...

139.790… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+34+\frac{1}{\phi}=$$
$$34+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^6+\frac{1}{2\sin(54\,°)}$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+34+\frac{1}{\phi}=$$
$$34+-\frac{1}{2\cos(216°)}+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^6$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+34+\frac{1}{\phi}=$$
$$34+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^6+-\frac{1}{2\sin(666°)}$$

(((1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^6+18+golden ratio^2

where 18 is a Lucas number

Input:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+18+\phi^2$$

ϕ is the golden ratio

Result:

125.790...

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

Alternative representations:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+18+\phi^2=$$
$$18+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^6+(2\sin(54°))^2$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+18+\phi^2 =$$
$$18+(-2\cos(216°))^2+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^6$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^6+18+\phi^2 =$$
$$18+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^6+(-2\sin(666°))^2$$

(((1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^9+729-76-Pi

Where 76 is a Lucas number and 729 = 9^3 (see Ramanujan cubes)

Input:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi$$

Result:

1728.44...

1728.44…

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

Alternative representations:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi =$$
$$653-180°+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^9$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 653+i\log(-1)+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^9$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 653-\cos^{-1}(-1)+\left(1+\frac{0.5}{0.5}+\frac{0.5^4}{0.5(1-0.5^2)}+\frac{0.5^9}{0.5(1-0.5^2)(1-0.5^3)}\right)^9$$

Series representations:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 1731.58-4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 1733.58-2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 1731.58-\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 1731.58-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 1731.58-4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-76-\pi = 1731.58-2\int_0^\infty \frac{\sin(t)}{t}\,dt$$

(((1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^9+729-18-7

where 18 and 7 are Lucas numbers

Input:

$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+729-18-7$$

Result:

1782.579706019089110335168460402380716828232902029615740744...

1782.579706.... result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

(((1+0.5/(1-0.5)+0.5^4/(((1-0.5)(1-0.5^2))+0.5^9/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^9+(x-47+1/golden ratio)-76-Pi = 1728.44

Input interpretation:

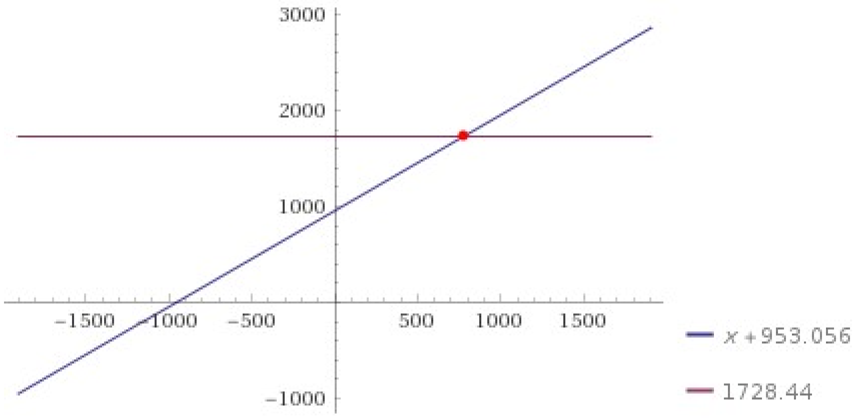
$$\left(1+\frac{0.5}{1-0.5}+\frac{0.5^4}{(1-0.5)(1-0.5^2)}+\frac{0.5^9}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^9+\left(x-47+\frac{1}{\phi}\right)-76-\pi = 1728.44$$

ϕ is the golden ratio

Result:

$x+953.056 = 1728.44$

Plot:



Alternate forms:

$x - 775.384 = 0$

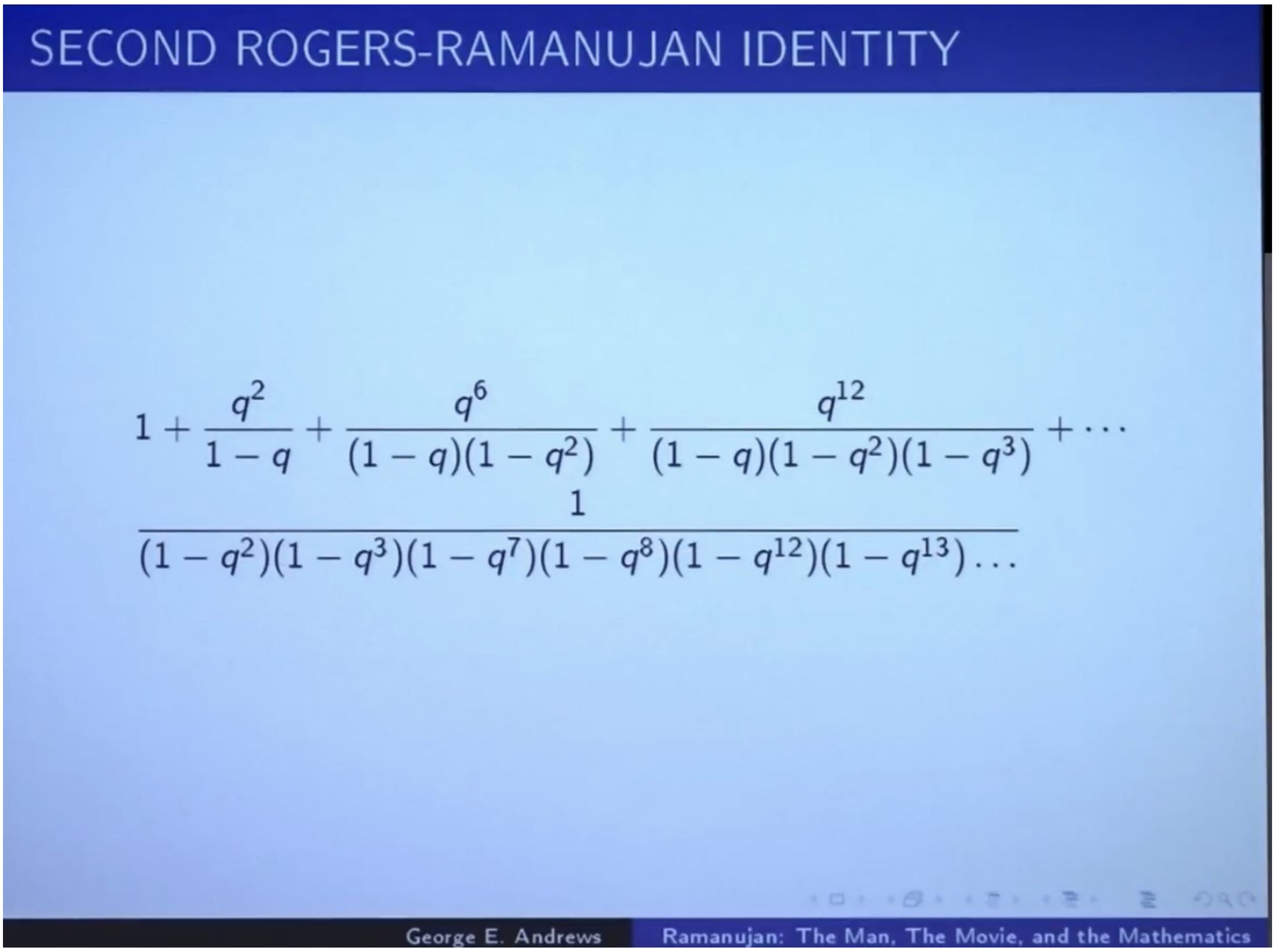
$x + 953.056 = 1728.44$

Solution:

$x \approx 775.384$

775.384 result practically equal to the rest mass of Neutral rho meson 775.26

Now, we have that:



1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2)))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3)))

Input:

$$1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}$$

Result:

1.542410714285714285714285714285714285714285714285714...

1.5424107142857…

Repeating decimal:

$1.542410\overline{714285}$ (period 6)

1/10^27[1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))) + 13/10^2]

where 13 is a Fibonacci number

Input:

$$\frac{1}{10^{27}}\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}+\frac{13}{10^2}\right)$$

Result:

$$1.6724107142857142857142857142857142857142857142857142\ldots \times 10^{-27}$$

$1.6724107142857\ldots*10^{-27}$ result practically equal to the proton mass in kg

1/(((1-0.5^2)(1-0.5^3)(1-0.5^7)(1-0.5^8)(1-0.5^12)(1-0.5^13)))

Input:

$$\frac{1}{(1-0.5^2)(1-0.5^3)(1-0.5^7)(1-0.5^8)(1-0.5^{12})(1-0.5^{13})}$$

Result:

$$1.5423955967321988413700481437761044347381640367273477745386\ldots$$

1.542395596732…

1/10^27[1/(((1-0.5^2)(1-0.5^3)(1-0.5^7)(1-0.5^8)(1-0.5^12)(1-0.5^13))) + 13/10^2]

Input:

$$\frac{1}{10^{27}}\left(\frac{1}{(1-0.5^2)(1-0.5^3)(1-0.5^7)(1-0.5^8)(1-0.5^{12})(1-0.5^{13})}+\frac{13}{10^2}\right)$$

Result:

$$1.6723955967321988413700481437761044347381640367273477\ldots \times 10^{-27}$$

$1.6723955967\ldots*10^{-27}$ result practically equal to the proton mass in kg

We have also that:

(((1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2)))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^16-7

where 7 is a Lucas number

Input:

$$\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^{16}-7$$

Result:

1019.125626936426527138045843785105594041168531938759483884...

1019.1256269… result practically equal to the rest mass of Phi meson 1019.445

(((1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2)))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^16+3^6-3^3

where 3 is a Fibonacci number

Input:

$$\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^{16}+3^6-3^3$$

Result:

1728.125626936426527138045843785105594041168531938759483884...

1728.1256269364…..

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

(((1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2)))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^16+3^6+3^3

Input:

$$\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^{16}+3^6+3^3$$

Result:

1782.125626936426527138045843785105594041168531938759483884...

1782.1256269…. result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

(((1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2)))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^11+29-7

where 29 and 7 are Lucas numbers

Input:

$$\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^{11}+29-7$$

Result:

139.5439733534701919006018363881289308202786724799000192200...

139.54397335… result practically equal to the rest mass of Pion meson 139.57 MeV

(((1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2)))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))))))^11+11-3

where 11 and 3 are Lucas numbers

Input:

$$\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)^{11}+11-3$$

Result:

125.5439733534701919006018363881289308202786724799000192200...

125.54397335…. result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

1/10^52(((((((1+0.5^2/(1-0.5)+0.5^6/(((1-0.5)(1-0.5^2))+0.5^12/(((1-0.5)(1-0.5^2)(1-0.5^3))))))-1/golden ratio+(21-3)/10^2+13/10^4))))

where 3, 21 and 13 are Fibonacci numbers

Input:

$$\frac{1}{10^{52}}\left(\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)-\frac{1}{\phi}+\frac{21-3}{10^2}+\frac{13}{10^4}\right)$$

ϕ is the golden ratio

Result:

$1.10568\ldots \times 10^{-52}$

1.10568…*10^{-52} result practically equal to the value of Cosmological Constant 1.1056*10^{-52} m^{-2}

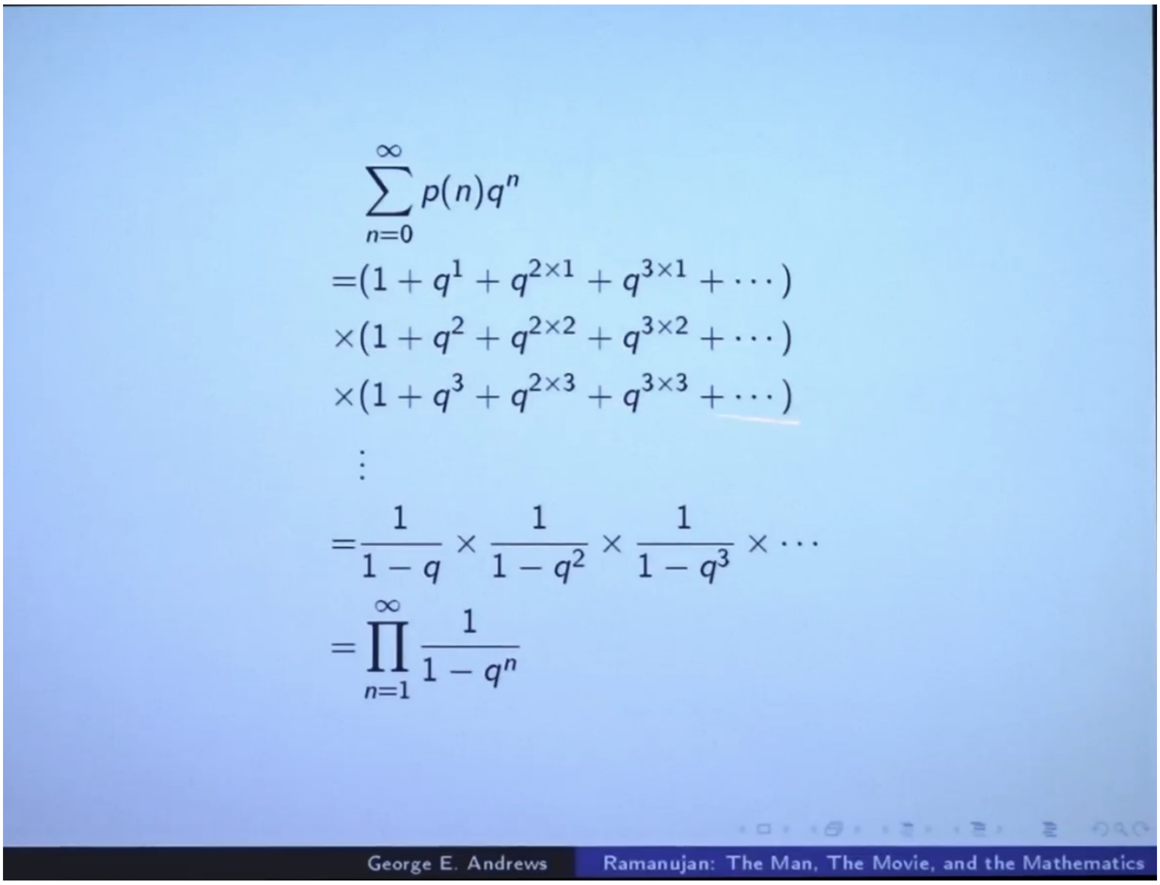
Alternative representations:

$$\frac{\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)-\frac{1}{\phi}+\frac{21-3}{10^2}+\frac{13}{10^4}}{10^{52}} = \frac{1+\frac{0.5^2}{0.5}+\frac{0.5^6}{0.5(1-0.5^2)}+\frac{0.5^{12}}{0.5(1-0.5^2)(1-0.5^3)}+\frac{18}{10^2}+\frac{13}{10^4}-\frac{1}{2\sin(54^\circ)}}{10^{52}}$$

$$\frac{\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)-\frac{1}{\phi}+\frac{21-3}{10^2}+\frac{13}{10^4}}{10^{52}} = \frac{1+\frac{0.5^2}{0.5}--\frac{1}{2\cos(216^\circ)}+\frac{0.5^6}{0.5(1-0.5^2)}+\frac{0.5^{12}}{0.5(1-0.5^2)(1-0.5^3)}+\frac{18}{10^2}+\frac{13}{10^4}}{10^{52}}$$

$$\frac{\left(1+\frac{0.5^2}{1-0.5}+\frac{0.5^6}{(1-0.5)(1-0.5^2)}+\frac{0.5^{12}}{(1-0.5)(1-0.5^2)(1-0.5^3)}\right)-\frac{1}{\phi}+\frac{21-3}{10^2}+\frac{13}{10^4}}{10^{52}} = \frac{1+\frac{0.5^2}{0.5}+\frac{0.5^6}{0.5(1-0.5^2)}+\frac{0.5^{12}}{0.5(1-0.5^2)(1-0.5^3)}+\frac{18}{10^2}+\frac{13}{10^4}--\frac{1}{2\sin(666^\circ)}}{10^{52}}$$

Now, we have that:



product (1/(1-q^n)), n=1 to infinity

Input interpretation:

$$\prod_{n=1}^{\infty} \frac{1}{1-q^n}$$

Infinite product:

$$\prod_{n=1}^{\infty} \frac{1}{1-q^n} = \frac{1}{(q;\, q)_{\infty}}$$

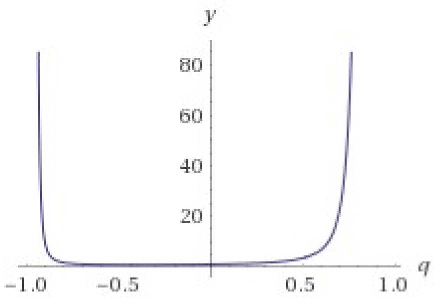
$(a;\, q)_n$ gives the q-Pochhammer symbol

Partial product formula:

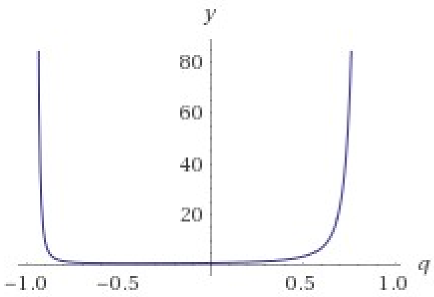
$$\prod_{n=1}^{m} \frac{1}{1-q^n} = \frac{1}{(q;\, q)_{m}}$$

$(a;\, q)_n$ gives the q-Pochhammer symbol

Plots:



(q from -1 to 1)



(q from -1 to 1)

For q = 0.5, we obtain.

product (1/(1-0.5^n)), n=1 to infinity

Input interpretation:

$$\prod_{n=1}^{\infty} \frac{1}{1-0.5^n}$$

Infinite product:

$$\prod_{n=1}^{\infty} \frac{1}{1-0.5^n} = 3.462746619455064$$

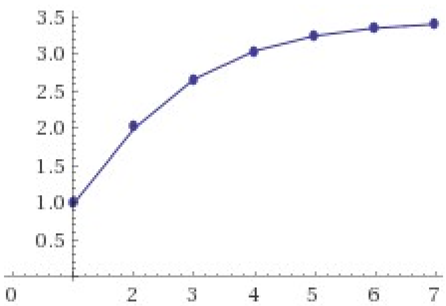
3.462746619455064

Partial product formula:

$$\prod_{n=1}^{m} \frac{1}{1-0.5^n} = \frac{1}{(0.5;\ 0.5)_m}$$

$(a;q)_n$ gives the q-Pochhammer symbol

Partial products:



We have that:

((((product (1/(1-0.5^n)), n=1 to infinity))))^5

Input interpretation:

$$\left(\prod_{n=1}^{\infty} \frac{1}{1-0.5^n}\right)^5$$

Result:

497.855798606219

497.855798606219 result practically equal to the rest mass of Kaon meson 497.614

((((product (1/(1-0.5^n)), n=1 to infinity))))^4 – 4

where 4 is a Lucas number

Input interpretation:

$$\left(\prod_{n=1}^{\infty} \frac{1}{1-0.5^n}\right)^4 - 4$$

Result:

139.7748277073093

139.7748277073093 result practically equal to the rest mass of Pion meson 139.57 MeV

((((product (1/(1-0.5^n)), n=1 to infinity))))^4 – 18

where 18 is a Lucas number

Input interpretation:

$$\left(\prod_{n=1}^{\infty} \frac{1}{1-0.5^n}\right)^4 - 18$$

Result:

125.7748277073093

125.7748277073093 result very near to the dilaton mass calculated as a type of Higgs boson: 125 GeV for T = 0 and to the Higgs boson mass 125.18 GeV

27*1/2(((((((product (1/(1-0.5^n)), n=1 to infinity))))^4 - 18+golden ratio^2)))-4

where 4 and 18 are Lucas numbers

Input interpretation:

$$27\times\frac{1}{2}\left(\left(\prod_{n=1}^{\infty}\frac{1}{1-0.5^n}\right)^4-18+\phi^2\right)-4$$

ϕ is the golden ratio

Result:

1729.303632896798

1729.303632... This result is very near to the mass of candidate glueball $f_0(1710)$ meson. Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. As a consequence, it is sometimes called a Zagier as a pun on the Gross–Zagier theorem. The number 1728 is one less than the Hardy–Ramanujan number 1729

27*1/2(((((((product (1/(1-0.5^n)), n=1 to infinity))))^4 - 18+golden ratio^2)))+47+Pi

where 47 is a Lucas number

Input interpretation:

$$27\times\frac{1}{2}\left(\left(\prod_{n=1}^{\infty}\frac{1}{1-0.5^n}\right)^4-18+\phi^2\right)+47+\pi$$

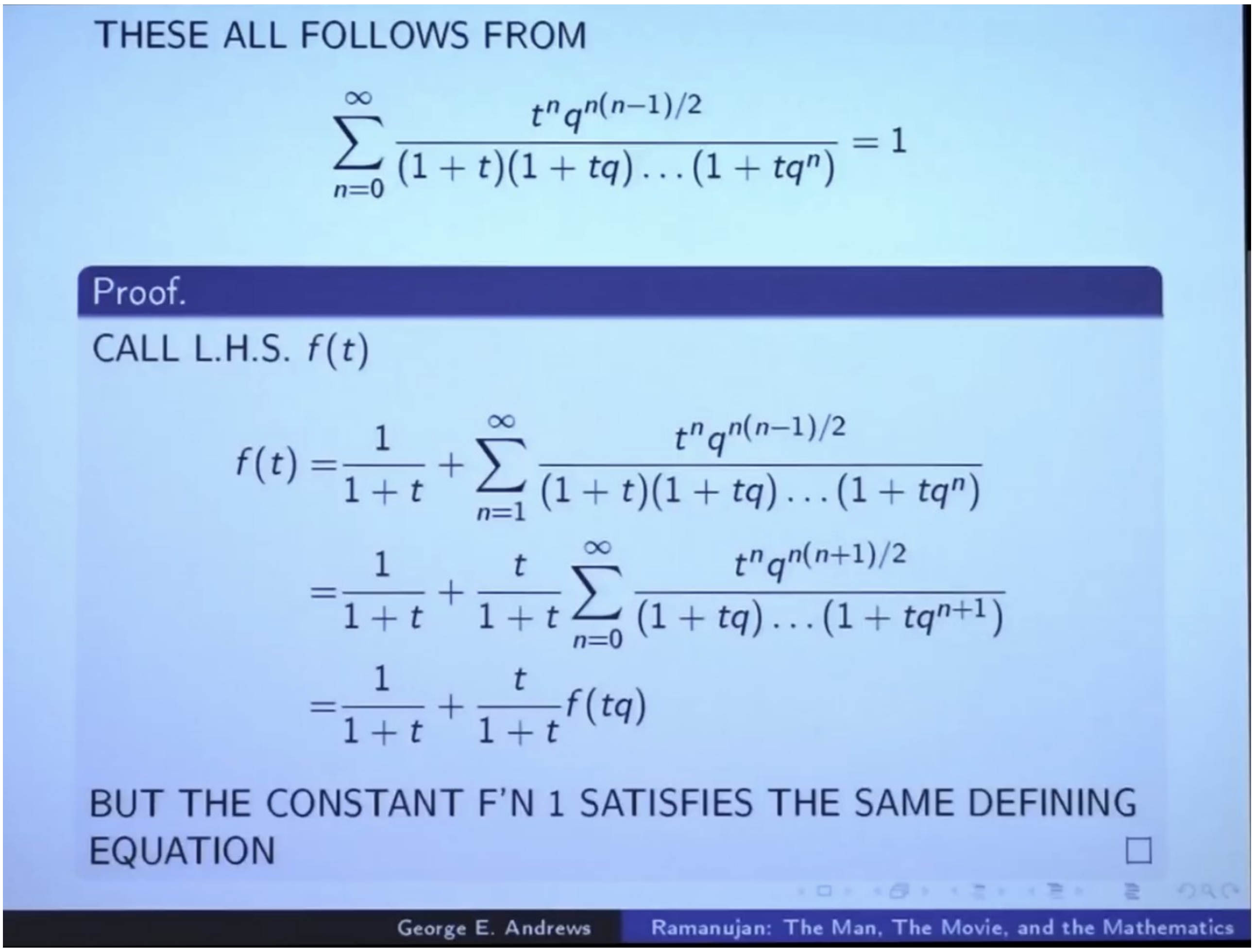
ϕ is the golden ratio

Result:

1783.445225550388

1783.445225.... result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

Now, we have that:



For q = 0.5 and t = 8, we obtain

1/(1+8) + sum (((8^n * 0.5^(n(n-1)/2)))) / (((1+8)(1+8*0.5)(1+8*0.5^n))), n=1..infinity

Input interpretation:

$$\frac{1}{1+8}+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n\times(n-1)/2}}{(1+8)(1+8\times 0.5)(1+8\times 0.5^n)}$$

Result:

2.79218

2.79218

1/10^27 ((((1/(1+8) + sum (((8^n * 0.5^(n(n-1)/2)))) / (((1+8)(1+8*0.5)(1+8*0.5^n))), n=1..infinity))))^1/2

Input interpretation:

$$\frac{1}{10^{27}}\sqrt{\frac{1}{1+8}+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n\times(n-1)/2}}{(1+8)(1+8\times 0.5)(1+8\times 0.5^n)}}$$

Result:

1.67098×10^{-27}

$1.67098*10^{-27}$ result practically equal to the value of the formula:

$$m_{p\prime}=2\times\frac{\eta}{R}m_P=1.6714213\times 10^{-2}\quad \text{kg}$$

that is the holographic proton mass (N. Haramein)

1/2((((1/(1+8) + sum (((8^n * 0.5^(n(n-1)/2)))) / (((1+8)(1+8*0.5)(1+8*0.5^n))), n=1..infinity))))^8 + 21+golden ratio

where 21 is a Fibonacci number

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{1+8}+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n\times(n-1)/2}}{(1+8)(1+8\times 0.5)(1+8\times 0.5^n)}\right)^8+21+\phi$$

ϕ is the golden ratio

Result:

1869.84

1869.84 result practically equal to the rest mass of D meson 1869.61

1/2((((1/(1+8) + sum (((8^n * 0.5^(n(n-1)/2)))) / (((1+8)(1+8*0.5)(1+8*0.5^n))), n=1..infinity))))^8 -123+Pi+golden ratio

where 123 is a Lucas number

Input interpretation:

$$\frac{1}{2}\left(\frac{1}{1+8}+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n\times(n-1)/2}}{(1+8)(1+8\times 0.5)(1+8\times 0.5^n)}\right)^8-123+\pi+\phi$$

ϕ is the golden ratio

Result:

1728.98

1728.98

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

((((1/(1+8) + sum (((8^n * 0.5^(n(n-1)/2)))) / (((1+8)(1+8*0.5)(1+8*0.5^n))), n=1..infinity))))^5-34+2+golden ratio

where 34 and 2 are Fibonacci numbers

Input interpretation:

$$\left(\frac{1}{1+8}+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n\times(n-1)/2}}{(1+8)(1+8\times 0.5)(1+8\times 0.5^n)}\right)^5-34+2+\phi$$

ϕ is the golden ratio

Result:

139.332

139.332 result practically equal to the rest mass of Pion meson 139.57 MeV

((((1/(1+8) + sum (((8^n * 0.5^(n(n-1)/2)))) / (((1+8)(1+8*0.5)(1+8*0.5^n))), n=1..infinity))))^5-55+13-golden ratio^2

where 13 and 55 are Fibonacci numbers

Input interpretation:

$$\left(\frac{1}{1+8}+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n\times(n-1)/2}}{(1+8)(1+8\times 0.5)(1+8\times 0.5^n)}\right)^5-55+13-\phi^2$$

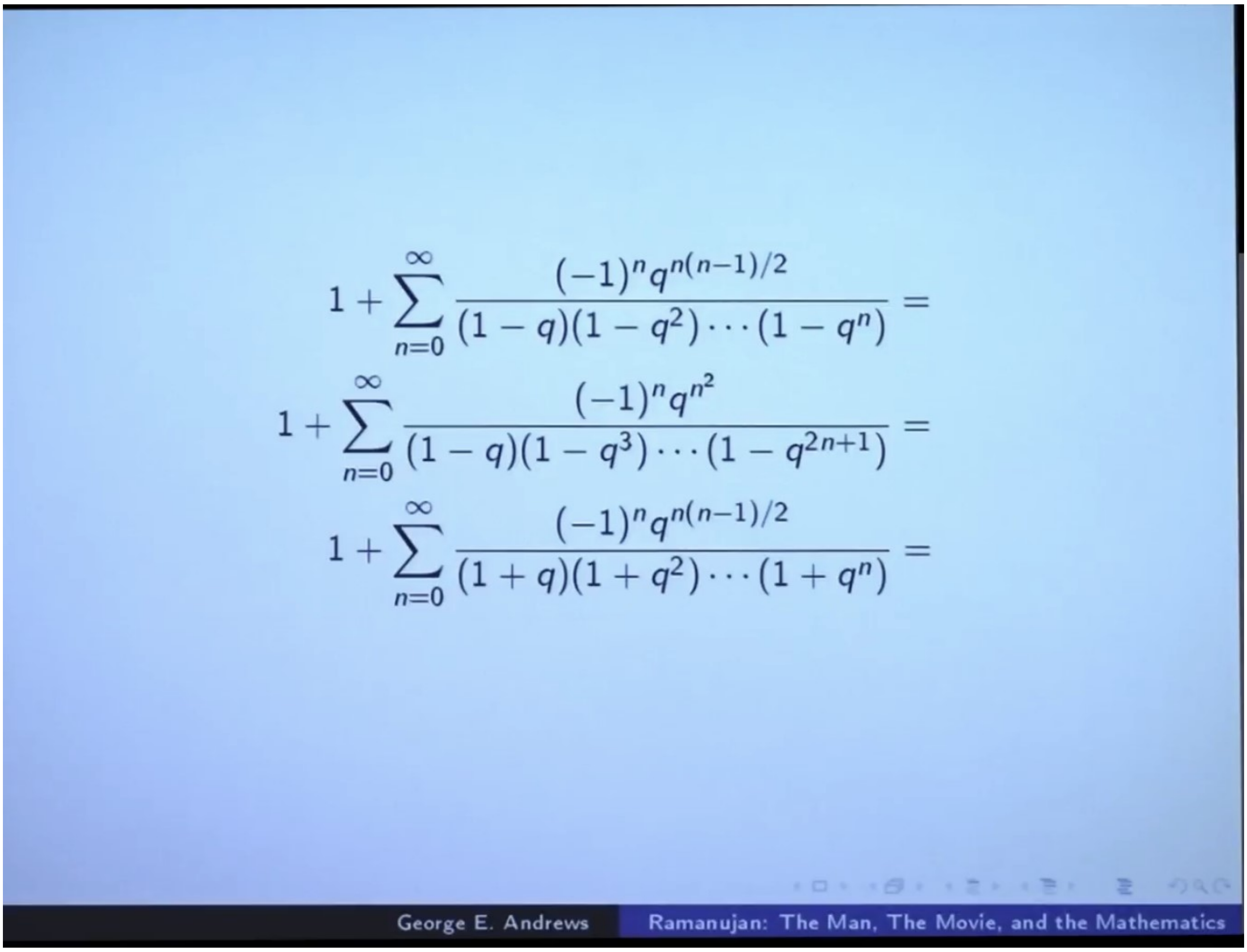
ϕ is the golden ratio

Result:

125.096

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

Now, we have that:



For q = -0.5

1 + sum ((((-1)^n * -0.5^(n(n-1)/2)))) / (((1-(-0.5)(1-(-0.5^2)(1-(-0.5^n)))))), n=0..infinity

Input interpretation:

$$1+\sum_{n=0}^{\infty}\frac{(-1)^n\times(-1)\times 0.5^{n\times(n-1)/2}}{1--0.5\left(1--0.5^2\left(1--0.5^n\right)\right)}$$

Result:

0.786479

0.786479

For q = 0.5

1 + sum ((((-1)^n * 0.5^((n)^2)))) / (((1-0.5)(1-0.5^3)(1-0.5^(2n+1)))), n=0..infinity

Input interpretation:

$$1+\sum_{n=0}^{\infty} \frac{(-1)^n \times 0.5^{n^2}}{(1-0.5)\left(1-0.5^3\right)\left(1-0.5^{2n+1}\right)}$$

Result:

4.40831

4.40831

1 + sum ((((-1)^n * 0.5^(n(n-1)/2)))) / (((1+0.5)(1+0.5^2)(1+0.5^n))), n=0..infinity

Input interpretation:

$$1+\sum_{n=0}^{\infty} \frac{(-1)^n \times 0.5^{n\times(n-1)/2}}{(1+0.5)\left(1+0.5^2\right)(1+0.5^n)}$$

Result:

1.07254

1.07254

we have that:

(0.786479 + 4.40831 + 1.07254)

Input interpretation:

0.786479 + 4.40831 + 1.07254

Result:

6.267329

6.267329

(2Pi)/(0.786479 + 4.40831 + 1.07254)

Input interpretation:

$$\frac{2\pi}{0.786479+4.40831+1.07254}$$

Result:

1.002529994385101927300335879376845506019284897721216110076...

1.0025299943851…. result very near to the following Rogers-Ramanujan continued fraction:

$$\frac{e^{-\frac{2\pi}{5}}}{\sqrt{\varphi\sqrt{5}-\varphi}}=1+\frac{e^{-2\pi}}{1+\frac{e^{-4\pi}}{1+\frac{e^{-6\pi}}{1+\frac{e^{-8\pi}}{1+\ldots}}}}\approx 1.0018674362$$

Alternative representations:

$$\frac{2\pi}{0.786479+4.40831+1.07254}=\frac{360\,°}{6.26733}$$

$$\frac{2\pi}{0.786479+4.40831+1.07254}=-\frac{2\,i\log(-1)}{6.26733}$$

$$\frac{2\pi}{0.786479+4.40831+1.07254}=\frac{2\cos^{-1}(-1)}{6.26733}$$

Series representations:

$$\frac{2\pi}{0.786479+4.40831+1.07254}=1.27646\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\frac{2\pi}{0.786479+4.40831+1.07254}=-0.63823+0.63823\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\frac{2\pi}{0.786479+4.40831+1.07254}=0.319115\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\frac{2\pi}{0.786479 + 4.40831 + 1.07254} = 0.63823 \int_0^\infty \frac{1}{1+t^2}\, dt$$

$$\frac{2\pi}{0.786479 + 4.40831 + 1.07254} = 1.27646 \int_0^1 \sqrt{1-t^2}\, dt$$

$$\frac{2\pi}{0.786479 + 4.40831 + 1.07254} = 0.63823 \int_0^\infty \frac{\sin(t)}{t}\, dt$$

Indeed, we have:

(0.786479 + 4.40831 + 1.07254)*1.0025299943851019273003358793768455060192848977212161

Input interpretation:

$(0.786479 + 4.40831 + 1.07254) \times$
$1.0025299943851019273003358793768455060192848977212161$

Result:

6.2831853071795864769252867665590057683943387987502115787 96...

6.283185037179.... ≈ 2π

1/2(0.786479 + 4.40831 + 1.07254)^3+Pi-1/golden ratio

Input interpretation:

$$\frac{1}{2}(0.786479 + 4.40831 + 1.07254)^3 + \pi - \frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.612...

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

Alternative representations:

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=\pi+\frac{6.26733^3}{2}--\frac{1}{2\cos(216^\circ)}$$

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=180^\circ+\frac{6.26733^3}{2}--\frac{1}{2\cos(216^\circ)}$$

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=\pi+\frac{6.26733^3}{2}-\frac{1}{2\cos\left(\frac{\pi}{5}\right)}$$

Series representations:

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=123.089-\frac{1}{\phi}+4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=121.089-\frac{1}{\phi}+2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=123.089-\frac{1}{\phi}+\sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=123.089-\frac{1}{\phi}+2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=123.089-\frac{1}{\phi}+4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$\frac{1}{2}(0.786479+4.40831+1.07254)^3+\pi-\frac{1}{\phi}=123.089-\frac{1}{\phi}+2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

1/2(0.786479 + 4.40831 + 1.07254)^3+18-golden ratio

where 18 is a Lucas number

Input interpretation:

$$\frac{1}{2}(0.786479 + 4.40831 + 1.07254)^3 + 18 - \phi$$

ϕ is the golden ratio

Result:

139.470...

139.470… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternative representations:

$$\frac{1}{2}(0.786479 + 4.40831 + 1.07254)^3 + 18 - \phi = 18 + \frac{6.26733^3}{2} - 2\sin(54°)$$

$$\frac{1}{2}(0.786479 + 4.40831 + 1.07254)^3 + 18 - \phi = 18 + 2\cos(216°) + \frac{6.26733^3}{2}$$

$$\frac{1}{2}(0.786479 + 4.40831 + 1.07254)^3 + 18 - \phi = 18 + \frac{6.26733^3}{2} + 2\sin(666°)$$

(0.786479 + 4.40831 + 1.07254)^4+144+34+8

where 144, 34 and 8 are Fibonacci numbers

Input interpretation:

$$(0.786479 + 4.40831 + 1.07254)^4 + 144 + 34 + 8$$

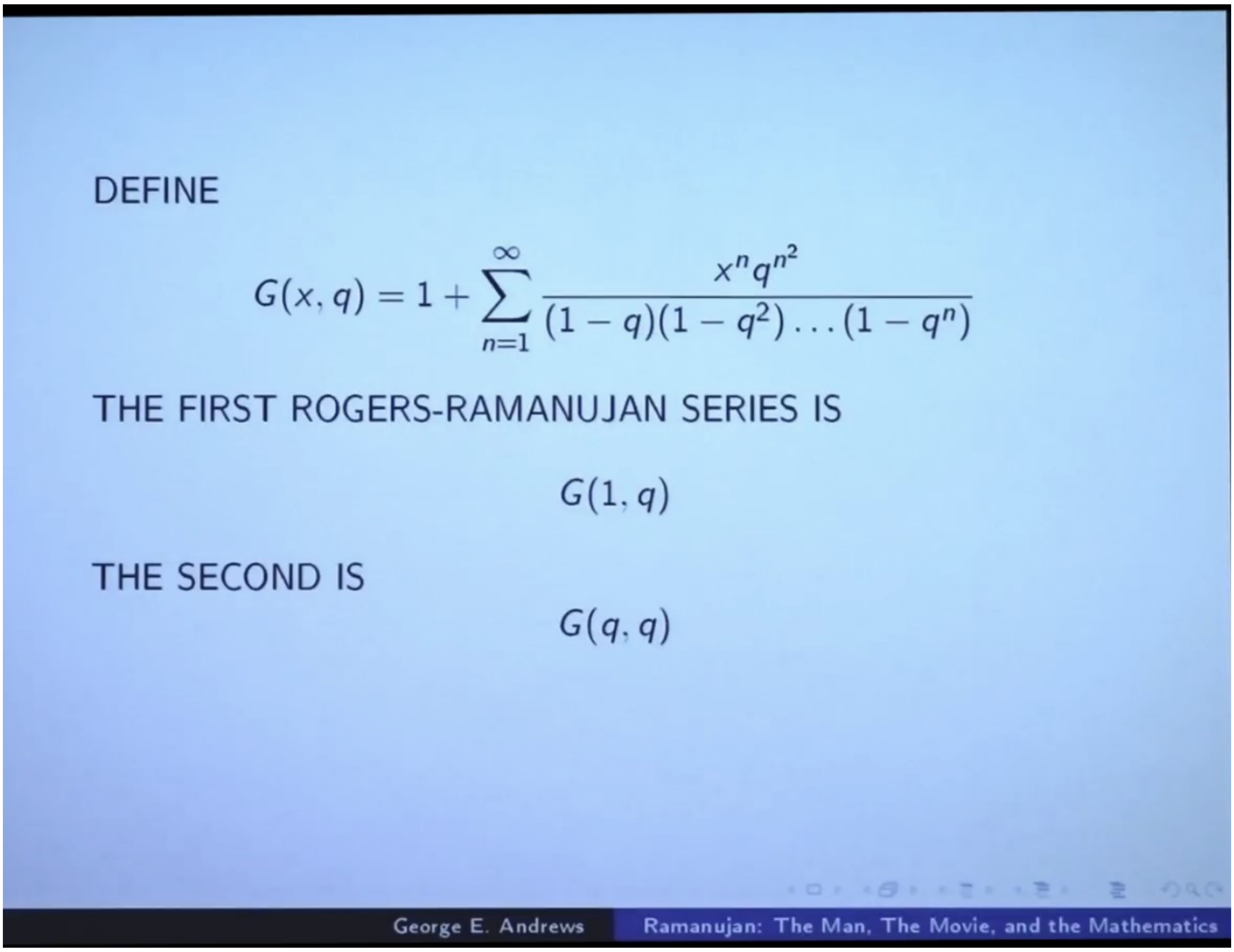
Result:

1728.87226946038356340276608 1

1728.87226946.....

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

Now, we have that:



For q = 0.5 and x = 8, we obtain:

1 + sum ((((8)^n * 0.5^((n)^2))) / (((1-0.5)(1-0.5^2)(1*0.5^n))), n=1..infinity

Input interpretation:

$$1+\sum_{n=1}^{\infty} \frac{8^n \times 0.5^{n^2}}{(1-0.5)\left(1-0.5^2\right)\left(1 \times 0.5^n\right)}$$

Result:

89.084

89.084 ≈ 89 that is a Fibonacci number

(55-5+1/golden ratio) + 1 + sum ((((8)^n * 0.5^((n)^2))) / (((1-0.5)(1-0.5^2)(1*0.5^n))), n=1..infinity

where 55 and 5 are Fibonacci numbers

Input interpretation:

$$\left(55-5+\frac{1}{\phi}\right)+1+\sum_{n=1}^{\infty} \frac{8^n \times 0.5^{n^2}}{(1-0.5)\left(1-0.5^2\right)\left(1 \times 0.5^n\right)}$$

ϕ is the golden ratio

Result:

139.702

139.702 result practically equal to the rest mass of Pion meson 139.57 MeV

(34+golden ratio^2) + 1 + sum ((((8)^n * 0.5^((n)^2))) / (((1-0.5)(1-0.5^2)(1*0.5^n))), n=1..infinity

where 34 is a Fibonacci number

Input interpretation:

$$\left(34+\phi^2\right)+1+\sum_{n=1}^{\infty} \frac{8^n \times 0.5^{n^2}}{(1-0.5)\left(1-0.5^2\right)\left(1 \times 0.5^n\right)}$$

ϕ is the golden ratio

Result:

125.702

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

18 (((1 + sum ((((8)^n * 0.5^((n)^2))) / (((1-0.5)(1-0.5^2)(1*0.5^n))), n=1..infinity)))) + 123 + golden ratio

where 18 and 123 are Lucas numbers

Input interpretation:

$$18\left(1+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n^2}}{(1-0.5)\left(1-0.5^2\right)\left(1\times 0.5^n\right)}\right)+123+\phi$$

ϕ is the golden ratio

Result:

1728.13

1728.13

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

18 (((1 + sum ((((8)^n * 0.5^((n)^2))) / (((1-0.5)(1-0.5^2)(1*0.5^n))), n=1..infinity)))) + 123 + 47 + 3Pi

where 47 is a Fibonacci number

Input interpretation:

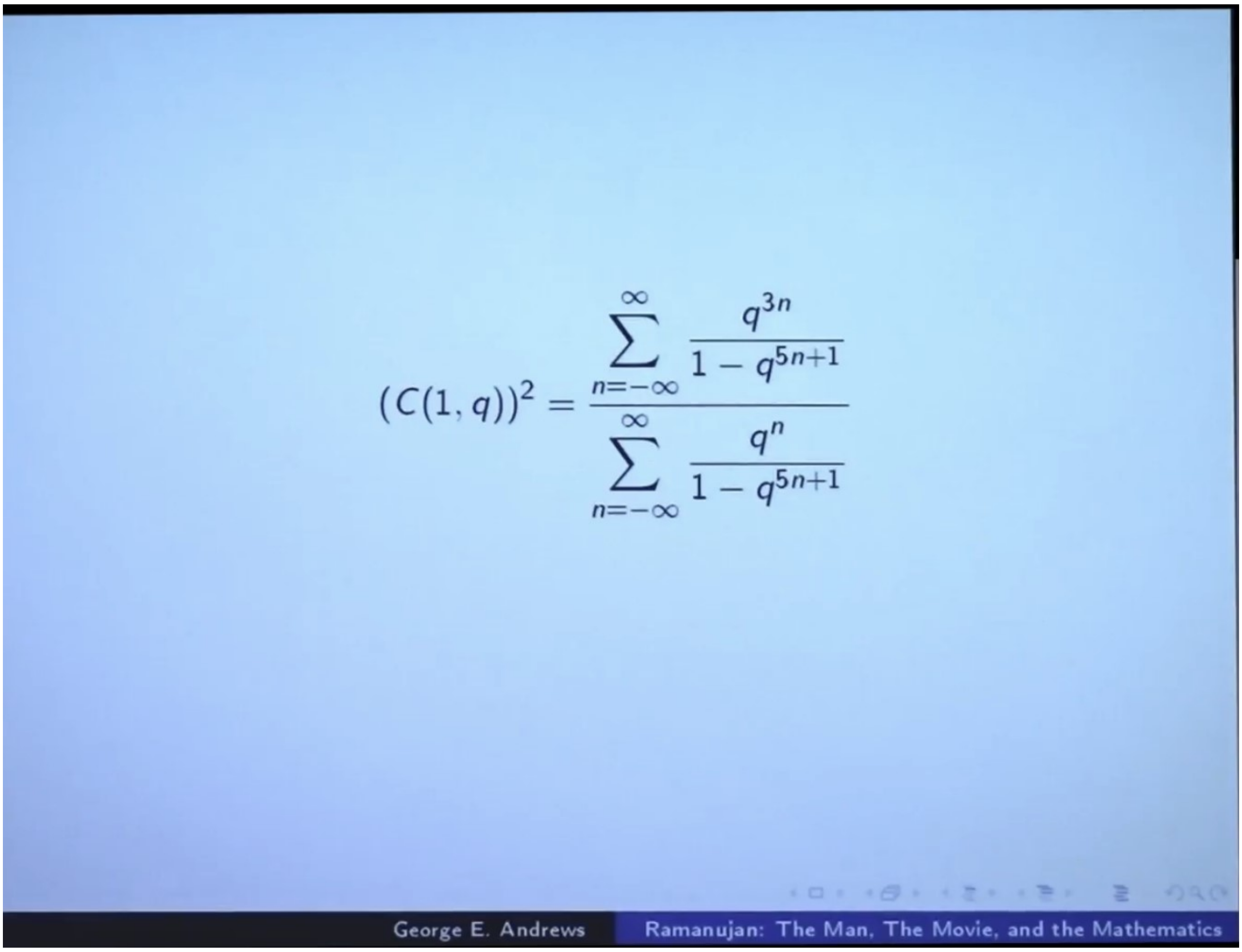
$$18\left(1+\sum_{n=1}^{\infty}\frac{8^n\times 0.5^{n^2}}{(1-0.5)\left(1-0.5^2\right)(1\times 0.5^n)}\right)+123+47+3\pi$$

Result:

1782.94

1782.94 result in the range of the hypothetical mass of Gluino (gluino = 1785.16 GeV).

Now, we have that:



For q = 0.5 we obtain:

sum (((0.5^((3n))))/(1-0.5^(5n+1)) , n=-infinity..infinity

Approximated sum:

$$\sum_{n=-\infty}^{\infty} \frac{0.5^{3n}}{1-0.5^{5n+1}} \approx 1.4446$$

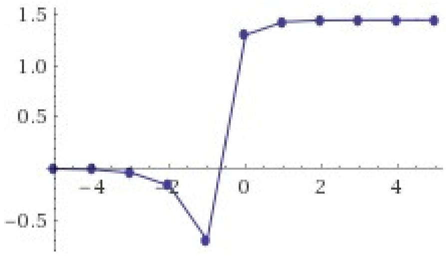
1.4446

Partial sum formula:

$$\sum_{n=0}^{m} \frac{0.5^{3n}}{1-0.5^{5n+1}} \approx -0.577078 \Big((0.61312 - 0.445458\, i)\, \psi_2^{(0)}(m + (1.2 - 1.81294\, i)) + (0.61312 + 0.445458\, i)\, \psi_2^{(0)}(m + (1.2 + 1.81294\, i)) - (0.234191 - 0.720766\, i)\, \psi_2^{(0)}(m + (1.2 - 3.62589\, i)) - (0.234191 + 0.720766\, i)\, \psi_2^{(0)}(m + (1.2 + 3.62589\, i)) - (6.22015 + 0\, i) - 0.757858\, \psi_2^{(0)}(m + 1.2) + \left(1.11022 \times 10^{-16} + 0\, i\right) m\Big)$$

$\psi_q(z)$ gives the q-digamma function

Partial sums:



sum (((0.5)^n))/(1-0.5^(5n+1)) , n=-infinity..infinity

Approximated sum:

$$\sum_{n=-\infty}^{\infty} \frac{0.5^{n}}{1-0.5^{5n+1}} \approx 2.86638$$

2.86638

Partial sum formula:

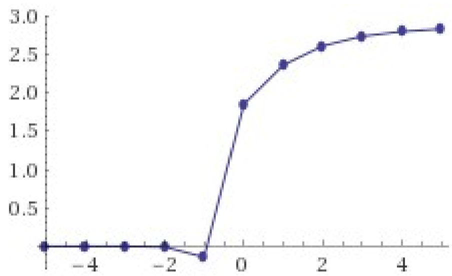
$$\sum_{n=0}^{m} \frac{0.5^n}{1-0.5^{5n+1}} \approx$$

$$0.288539 \Big((0.354967 - 1.09248 i) \left(\psi_2^{(0)}(m + (1.2 - 1.81294 i)) + m(-\log(2)) - \log(2)\right) + (0.354967 + 1.09248 i) \left(\psi_2^{(0)}(m + (1.2 + 1.81294 i)) + m(-\log(2)) - \log(2)\right) - (0.929316 + 0.675188 i) \left(\psi_2^{(0)}(m + (1.2 - 3.62589 i)) + m(-\log(2)) - \log(2)\right) - (0.929316 - 0.675188 i) \left(\psi_2^{(0)}(m + (1.2 + 3.62589 i)) + m(-\log(2)) - \log(2)\right) + (16.5647 + 0 i) + 1.1487 \left(\psi_2^{(0)}(m + 1.2) + m(-\log(2)) - \log(2)\right)\Big)$$

$\log(x)$ is the natural logarithm

$\psi_q(z)$ gives the q-digamma function

Partial sums:



Thence:

(1.4446 / 2.86638)

Input interpretation:

$$\frac{1.4446}{2.86638}$$

Result:

0.503980630621201655049225852817839923527236444574690027142...

0.50398063...

76*1/(1.4446 / 2.86638)-11

where 76 and 11 are Lucas numbers

Input interpretation:

$$76\times\frac{1}{\frac{1.4446}{2.86638}}-11$$

Result:

139.79944621348470164751488301259864322303751903641146338 08...

139.79944621... result practically equal to the rest mass of Pion meson 139.57 MeV

76*1/(1.4446 / 2.86638)-29+Pi+1/golden ratio

where 29 is a Lucas number

Input interpretation:

$$76\times\frac{1}{\frac{1.4446}{2.86638}}-29+\pi+\frac{1}{\phi}$$

ϕ is the golden ratio

Result:

125.559...

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

Alternative representations:

$$\frac{76}{\frac{1.4446}{2.86638}}-29+\pi+\frac{1}{\phi}=-29+\pi+-\frac{1}{2\cos(216^\circ)}+\frac{76}{\frac{1.4446}{2.86638}}$$

$$\frac{76}{\frac{1.4446}{2.86638}}-29+\pi+\frac{1}{\phi}=-29+180^\circ+-\frac{1}{2\cos(216^\circ)}+\frac{76}{\frac{1.4446}{2.86638}}$$

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = -29 + \pi + \frac{1}{2\cos\left(\frac{\pi}{5}\right)} + \frac{76}{\frac{1.4446}{2.86638}}$$

Series representations:

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = 121.799 + \frac{1}{\phi} + 4\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}$$

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = 119.799 + \frac{1}{\phi} + 2\sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}$$

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = 121.799 + \frac{1}{\phi} + \sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = 121.799 + \frac{1}{\phi} + 2\int_0^{\infty} \frac{1}{1+t^2}\,dt$$

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = 121.799 + \frac{1}{\phi} + 4\int_0^{1} \sqrt{1-t^2}\,dt$$

$$\frac{76}{\frac{1.4446}{2.86638}} - 29 + \pi + \frac{1}{\phi} = 121.799 + \frac{1}{\phi} + 2\int_0^{\infty} \frac{\sin(t)}{t}\,dt$$

16*55/(1.4446 / 2.86638)-18

where 55 is Fibonacci number and 18 is a Lucas number

Input interpretation:

$$16 \times \frac{55}{\frac{1.4446}{2.86638}} - 18$$

Result:

1728.098850892980755918593382251142184687802852000553786515...

Repeating decimal:

1728.098850892980755918593382251142184687802852000553786515...

(period 3480)

1728.09885089....

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

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References

"17Aug18 Professor George E. Andrews"
George E. Andrews Tutte 100th distinguished Lecture Series -
https://www.youtube.com/watch?v=IBWCm34QmjQ&t=1749s