On the mathematical connections between some Ramanujan formulas concerning p(n) and τ(n), several equations of Brane Supersymmetry Breaking, various parameters concerning Particle Physics, ϕ and ζ(2).

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Abstract

In this paper we describe and analyze new mathematical connections between some Ramanujan formulas concerning p(n) and τ(n), several equations of Brane Supersymmetry Breaking, various parameters concerning Particle Physics, ϕ and ζ(2).

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https://opc.mfo.de/detail?photo_id=10196&would_like_to_publish=1





https://blog.vedicmathsindia.org/srinivasa-ramanujan/

From:

An Update on Brane Supersymmetry Breaking
J. Mourad a and A. Sagnotti - arXiv:1711.11494v1 [hep-th] 30 Nov 2017

We have that:

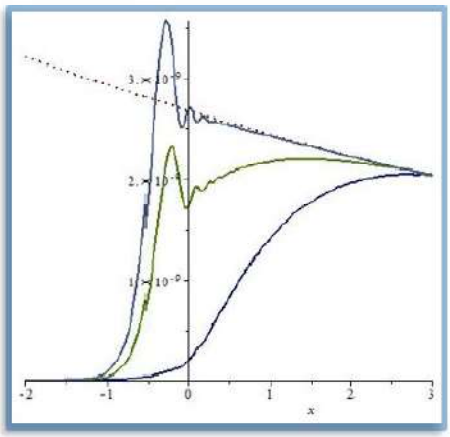


Figure 2: Some primordial power spectra obtained from a double exponential potential of the type $V = \exp(\sqrt{6}\phi) + \exp(\sqrt{6}\gamma\phi)$, with $\gamma \simeq 1/12$: the three curves, from top to bottom, correspond to progressively harder impacts of ϕ on the exponential barrier described by the first term.

$$V = \exp(\sqrt{6}\phi) + \exp(\sqrt{6}\gamma\phi),$$

$$\gamma \simeq 1/12:$$

We obtain, for $\phi = 0.9568666373$ that is equal also to the following Rogers-Ramanujan continued fraction result:

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

= 0.9568666373

((exp(0.9568666373*sqrt6)+exp(0.9568666373*1/12*sqrt6)))

Input interpretation:

$$\exp\left(0.9568666373\sqrt{6}\right)+\exp\left(0.9568666373\times\frac{1}{12}\sqrt{6}\right)$$

Result:

11.63682462...

11.63682462…

Series representations:

$$\exp\left(0.956867\sqrt{6}\right)+\exp\left(\frac{0.956867\sqrt{6}}{12}\right)=\exp\left(0.0797389\sqrt{5}\sum_{k=0}^{\infty}5^{-k}\binom{\frac{1}{2}}{k}\right)+\exp\left(0.956867\sqrt{5}\sum_{k=0}^{\infty}5^{-k}\binom{\frac{1}{2}}{k}\right)$$

$$\exp\left(0.956867\sqrt{6}\right)+\exp\left(\frac{0.956867\sqrt{6}}{12}\right)=\exp\left(0.0797389\sqrt{5}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)+\exp\left(0.956867\sqrt{5}\sum_{k=0}^{\infty}\frac{\left(-\frac{1}{5}\right)^k\left(-\frac{1}{2}\right)_k}{k!}\right)$$

$$\exp\left(0.956867\sqrt{6}\right)+\exp\left(\frac{0.956867\sqrt{6}}{12}\right)=\exp\left(\frac{0.0398694\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}5^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)+\exp\left(\frac{0.478433\sum_{j=0}^{\infty}\operatorname{Res}_{s=-\frac{1}{2}+j}5^{-s}\,\Gamma\left(-\frac{1}{2}-s\right)\Gamma(s)}{\sqrt{\pi}}\right)$$

From:

Brane SUSY Breaking, non-linear SUSY and Some Applications
Augusto Sagnotti - Scuola Normale Superiore and INFN – Pisa - TFI 2017 – Theories of the Fundamental Interactions - Parma, September 11-23 2017

$$V = V_0 \left[\left(1 - e^{-(\phi+\Delta)\sqrt{\frac{2}{3}}} \right)^2 + e^{\phi\sqrt{6}} \right]$$

$$\Delta = (0.351 \pm 0.114) \times 10^{-3}\,\mathrm{Mpc}^{-1}$$

We have that

0.000351/Mpc (reciprocal megaparsecs)

is equal to:

1.138×10^{-29} m^2/L (square meters per liter)

1.831×10^{-23} mi/mi^2 (miles per square mile)

1.138×10^{-26} m/m^2 (meters per square meter)

$1.138 * 10^{-26}$

1.08602*[(((((((1-e^-((((((0.9568666373+(1.138×10^-26)))*(sqrt(2/3))))))))))^2+(((exp(0.9568666373*sqrt6)))))))]

Input interpretation:

$$1.08602 \left(\left(1 - \exp\left(-\left(\left(0.9568666373 + 1.138 \times 10^{-26} \right) \sqrt{\frac{2}{3}} \right) \right) \right)^2 + \exp\left(0.9568666373\sqrt{6} \right) \right)$$

Result:

11.6368...

11.6368… result very near to the black hole entropy 11.8458 = ln(139503)

Or, for V_0 = (1+1/12) :

(1+1/12)*[(((((((1-e^-((((((0.9568666373+(1.138×10^-26)))*(sqrt(2/3))))))))))^2+(((exp(0.9568666373*sqrt6)))))))]

Input interpretation:

$$\left(1+\frac{1}{12}\right)\left(\left(1-\exp\left(-\left(\left(0.9568666373+1.138\times 10^{-26}\right)\sqrt{\frac{2}{3}}\right)\right)\right)^2+\exp\left(0.9568666373\sqrt{6}\right)\right)$$

Result:

11.60800757...

11.60800757… as above

We have also:

[[1.08602*[(((((((1-e^-((((((0.9568666373+(1.138×10^-26)))*(sqrt(2/3))))))))))^2+(((exp(0.9568666373*sqrt6)))))))]]]^1/5

Input interpretation:

$$\left(1.08602\left(\left(1-\exp\left(-\left(\left(0.9568666373+1.138\times 10^{-26}\right)\sqrt{\frac{2}{3}}\right)\right)\right)^2+\exp\left(0.9568666373\sqrt{6}\right)\right)\right)\text{^}(1/5)$$

Result:

1.633679...

1.633679…. $\approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

[[1.08602*[(((((((1-e^-((((((0.9568666373+(1.138×10^-26)))*(sqrt(2/3)))))))))))^2+(((exp(0.9568666373*sqrt6)))))))]]]^2+4

Input interpretation:

$$\left(1.08602\left(\left(1-\exp\left(-\left(\left(0.9568666373+1.138\times 10^{-26}\right)\sqrt{\frac{2}{3}}\right)\right)\right)^2+\exp\left(0.9568666373\sqrt{6}\right)\right)\right)^2+4$$

Result:

139.415...

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

[[1.08602*[(((((((1-e^-((((((0.9568666373+(1.138×10^-26)))*(sqrt(2/3)))))))))))^2+(((exp(0.9568666373*sqrt6)))))))]]]^2-7-Pi

Input interpretation:

$$\left(1.08602\left(\left(1-\exp\left(-\left(\left(0.9568666373+1.138\times 10^{-26}\right)\sqrt{\frac{2}{3}}\right)\right)\right)^2+\exp\left(0.9568666373\sqrt{6}\right)\right)\right)^2-7-\pi$$

Result:

125.273...

125.273… result very near to the Higgs boson mass 125.18 GeV

27*1/2*((([[1.08602*[(((((((1-e^-((((((0.9568666373+(1.138×10^-26)))*(sqrt(2/3)))))))))))^2+(((exp(0.9568666373*sqrt6)))))))]]]^2-4-Pi)))-3

Input interpretation:

$$27 \times \frac{1}{2}\left(\left(1.08602\left(\left(1-\exp\left(-\left(\left(0.9568666373+1.138\times 10^{-26}\right)\sqrt{\frac{2}{3}}\right)\right)\right)^2+\exp\left(0.9568666373\sqrt{6}\right)\right)^2-4-\pi\right)-3\right)$$

Result:

1728.69...

1728.69…

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

With regard 27 (From Wikipedia):

*"The fundamental group of the complex form, compact real form, or any algebraic version of E_6 is the cyclic group **Z**/3**Z**, and its outer automorphism group is the cyclic group **Z**/2**Z**. Its fundamental representation is 27-dimensional (complex), and a basis is given by the 27 lines on a cubic surface. The dual representation, which is inequivalent, is also 27-dimensional. In particle physics, E_6 plays a role in some grand unified theories".*

From

O P E N S T R I N G S

Augusto SAGNOTTI

U. Roma "Tor Vergata"

Andrejewski Lectures
(Berlin, Fall 1999)

We have that:

- Defining

$$\tau = \tau_1 + i\tau_2 = s + i\frac{t}{\alpha'\pi} \qquad q = e^{2\pi i\tau} \qquad \bar{q} = e^{-2\pi i\bar{\tau}}$$

and

- The full **NS sector** contribution from **odd** numbers of fermionic oscillators (8 **periodic bosons** + 8 **antiperiodic fermions**) is:

$$\frac{\prod_{m=1}^{\infty}(1+q^{m-1/2})^8 - \prod_{m=1}^{\infty}(1-q^{m-1/2})^8}{2\ q^{1/2}\prod_{m=1}^{\infty}(1-q^m)^8}$$

For s = -8; t = - 8; u = -16 and m = 1

we obtain:

exp[(2Pi*i*(((-8+((i*(-8))/(0.9568666373*Pi))))))]

Input interpretation:

$$\exp\left(2\pi i\left(-8+\frac{i\times(-8)}{0.9568666373\,\pi}\right)\right)$$

i is the imaginary unit

Result:

$1.82786352... \times 10^7$

$1.82786352*10^7 = q$

Thence, from

$$\frac{\prod_{m=1}^{\infty}(1+q^{m-1/2})^8-\prod_{m=1}^{\infty}(1-q^{m-1/2})^8}{2\,q^{1/2}\prod_{m=1}^{\infty}(1-q^m)^8}$$

we obtain:

((((((1+1.82786352e+7^(1-1/2))^8 - (1-1.82786352e+7^(1-1/2))^8))))) /
(((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8)))))

Input interpretation:

$$\frac{(1+(1.82786352\times10^7)^{1-1/2})^8-(1-(1.82786352\times10^7)^{1-1/2})^8}{2\sqrt{1.82786352\times10^7}\,(1-1.82786352\times10^7)^8}$$

Result:

$3.92077135326911371761458600207309671984913656392642 56... \times 10^{-36}$

$3.9207713532…*10^{-36}$

From which, we obtain:

34/(21 π) * 8 * ((((((1+1.82786352e+7^(1-1/2))^8 - (1-1.82786352e+7^(1-1/2))^8))))) / (((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8)))))

Input interpretation:

$$\frac{34}{21\,\pi}\times8\times\frac{(1+(1.82786352\times10^7)^{1-1/2})^8-(1-(1.82786352\times10^7)^{1-1/2})^8}{2\sqrt{1.82786352\times10^7}\,(1-1.82786352\times10^7)^8}$$

Result:

$1.61648... \times 10^{-35}$

1.61648…*10^{-35} result practically equal to the value of Planck length 1.616255*10^{-35} m

From

$$\frac{O_8}{\eta^8} = \frac{\prod_{m=1}^{\infty}(1+q^{m-1/2})^8 + \prod_{m=1}^{\infty}(1-q^{m-1/2})^8}{2\ q^{1/2}\prod_{m=1}^{\infty}(1-q^m)^8}$$

$$\frac{V_8}{\eta^8} = \frac{\prod_{m=1}^{\infty}(1+q^{m-1/2})^8 - \prod_{m=1}^{\infty}(1-q^{m-1/2})^8}{2\ q^{1/2}\prod_{m=1}^{\infty}(1-q^m)^8}$$

((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8)))))) /
(((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8)))))

Input interpretation:

$$\frac{(1+(1.82786352\times 10^7)^{1-1/2})^8 + (1-(1.82786352\times 10^7)^{1-1/2})^8}{2\sqrt{1.82786352\times 10^7}\ (1-1.82786352\times 10^7)^8}$$

Result:

$2.0953371... \times 10^{-33}$

2.0953371…*10^{-33}

From which:

1/20((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8)))))) /
(((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8)))))

Input interpretation:

$$\frac{1}{20}\times\frac{(1+(1.82786352\times10^7)^{1-1/2})^8+(1-(1.82786352\times10^7)^{1-1/2})^8}{2\sqrt{1.82786352\times10^7}\,(1-1.82786352\times10^7)^8}$$

Result:

$1.0476686\ldots\times10^{-34}$

1.0476686…*10^{-34} result very near to the value of reduced Planck constant

1.054571817...×10^{-34} J·s

Dividing the two results, we obtain:

((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8)))) / ((((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8))))) / 3.9207713532691137 × 10^-36

Input interpretation:

$$\frac{(1+(1.82786352\times10^7)^{1-1/2})^8+(1-(1.82786352\times10^7)^{1-1/2})^8}{2\sqrt{1.82786352\times10^7}\,(1-1.82786352\times10^7)^8}}{3.9207713532691137\times10^{-36}}$$

Result:

534.41962...

534.41962…

And performing the ln:

ln(534.41962)

Input interpretation:

log(534.41962)

log(x) is the natural logarithm

Result:

6.28118134...

6.28118134… ≈ 2π

Alternative representations:

$$\log(534.42) = \log_e(534.42)$$

$$\log(534.42) = \log(a)\log_a(534.42)$$

$$\log(534.42) = -\mathrm{Li}_1(-533.42)$$

Series representations:

$$\log(534.42) = \log(533.42) - \sum_{k=1}^{\infty} \frac{(-1)^k\, e^{-6.27931\,k}}{k}$$

$$\log(534.42) = 2\,i\,\pi \left\lfloor \frac{\arg(534.42 - x)}{2\,\pi} \right\rfloor + \log(x) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(534.42 - x)^k\, x^{-k}}{k} \quad \text{for } x < 0$$

$$\log(534.42) = \left\lfloor \frac{\arg(534.42 - z_0)}{2\,\pi} \right\rfloor \log\left(\frac{1}{z_0}\right) + \log(z_0) + \left\lfloor \frac{\arg(534.42 - z_0)}{2\,\pi} \right\rfloor \log(z_0) - \sum_{k=1}^{\infty} \frac{(-1)^k\,(534.42 - z_0)^k\, z_0^{-k}}{k}$$

Integral representations:

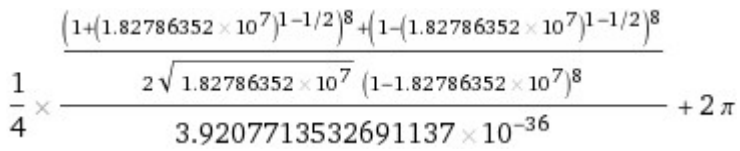
$$\log(534.42) = \int_1^{534.42} \frac{1}{t}\, dt$$

$$\log(534.42) = \frac{1}{2\,i\,\pi} \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{e^{-6.27931\,s}\,\Gamma(-s)^2\,\Gamma(1+s)}{\Gamma(1-s)}\, ds \quad \text{for } -1 < \gamma < 0$$

We have also:

1/4*(((((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8))))) / (((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8))))) / 3.9207713532691137 × 10^-36)))+2Pi

Input interpretation:



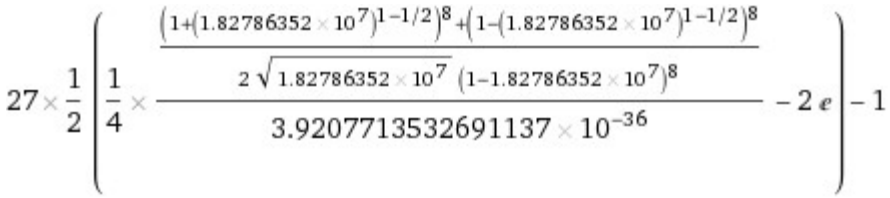
Result:

139.88809...

139.88809… result practically equal to the rest mass of Pion meson 139.57 MeV

27*1/2[1/4*(((((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8))))) / (((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8))))) / 3.9207713532691137 × 10^-36)))-2e]-1

Input interpretation:



Result:

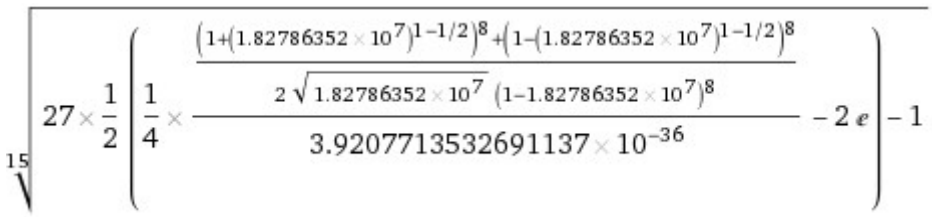
1729.2726...

1729.2726…

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

(((27*1/2[1/4*(((((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8))))) / (((((2*1.82786352e+7^(1/2) * (1-1.82786352e+7)^8))))) / 3.9207713532691137 × 10^-36)))-2e]-1)))^1/15

Input interpretation:



Result:

1.64383251...

$1.64383251\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

We note that, from

((((((1+1.82786352e+7^(1-1/2))^8 + (1-1.82786352e+7^(1-1/2))^8))))))

Input interpretation:

$\left(1+\left(1.82786352\times 10^7\right)^{1-1/2}\right)^8+\left(1-\left(1.82786352\times 10^7\right)^{1-1/2}\right)^8$

Result:

$2.232573279202488845838886064570912\times 10^{29}$

$2.23257327\ldots *10^{29}$

p(885) = 222092489913497780851227603386 =

$= 2.222092489913497780851227603386\times 10^{29}$

We observe that $2.23232573*10^{29}$ is near to the partition number p(885) = $2.222092489913497780851227603386\times 10^{29}$

((((((1+1.82786352e+7^(1-1/2))^8 - (1-1.82786352e+7^(1-1/2))^8))))))

Input interpretation:

$\left(1+\left(1.82786352\times 10^7\right)^{1-1/2}\right)^8-\left(1-\left(1.82786352\times 10^7\right)^{1-1/2}\right)^8$

Result:

$4.17756607674260809651708828669734088082953284669287 72... \times 10^{26}$

$4.1775660767\ldots * 10^{26}$

p(742)= 423762349321394151918928481 =

$= 4.23762349321394151918928481 \times 10^{26}$

We have that:

(2.220924899134977808512276033 86 × 10^29/4.23762349321394151918928481 × 10^26)

Input interpretation:

$$\frac{2.22092489913497780851227603386 \times 10^{29}}{4.23762349321394151918928481 \times 10^{26}}$$

Result:

524.096796870115837728022866427255954441981643544175321960 8...

524.09679687….

(524.096796870115837728/4)+8

Input interpretation:

$$\frac{524.096796870115837728}{4} + 8$$

Result:

139.024199217528959432

139.024199… result practically equal to the rest mass of Pion meson 139.57 MeV

27*1/2(((524.096796870115837728/4)-3))+1

Input interpretation:

$$27\times\frac{1}{2}\left(\frac{524.096796870115837728}{4}-3\right)+1$$

Result:

1729.326689436640952332

1729.3266894….

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

[27*1/2(((524.096796870115837728/4)-3))+1]^1/15

Input interpretation:

$$\sqrt[15]{27\times\frac{1}{2}\left(\frac{524.096796870115837728}{4}-3\right)+1}$$

Result:

1.643835933191571879903...

1.6438359…. $\approx \zeta(2)=\frac{\pi^2}{6}=1.644934\ldots$

Now, we have that:

- The **closed** sector is **chiral**, and the open sector contains different numbers of L and R fermions. With "complex" charges, the vacuum channel respects **positivity** only because $n = \bar{n}$, $m = \bar{m}$.

$$\tilde{A}_3 = \frac{2^{-6}}{2}\Big[(n+\bar{n}+m+\bar{m})^2 V_8 - (n+m-\bar{n}-\bar{m})^2 O_8 - (m-n-\bar{n}+\bar{m})^2 C_8 + (m-n+\bar{n}-\bar{m})^2 S_8\Big]$$

- Here the RR tadpole condition is $m = 32+n$. $n = 0$: **non-tachyonic spectrum** with gauge group $U(32)$.

We obtain, for n = 2:

2^(-6)/2*((((32+2+32+2+4)^2-(32+2+32+2-4)^2)))

Input:

$$\frac{1}{2^6 \times 2}\left((32+2+32+2+4)^2 - (32+2+32+2-4)^2\right)$$

Exact result:

$$\frac{17}{2}$$

Decimal form:

8.5

8.5

For n = 6

2^(-6)/2*((((32+4+32+4+8)^2-(32+4+32+4-8)^2)))

Input:

$$\frac{1}{2^6 \times 2}\left((32+4+32+4+8)^2 - (32+4+32+4-8)^2\right)$$

Result:

18

18

Now:

$$N = 2^{13} = 8192$$

If $\gamma_{00} = 1$ the gauge group is **orthogonal** $(SO(16))$.
If $\gamma_{00} = -1$ the gauge group is **symplectic** $(USp(16))$.

$$\frac{2^{-5}}{2}(2N)^2 + \frac{2^5}{2} - 2(2N)\left[\frac{1}{2}\sum_{ij}\gamma_{ij}\right] = 0$$

2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2

Input:

$$\frac{1}{2^5 \times 2}(2 \times 8192)^2 + \frac{2^5}{2} - 2(2 \times 8192) \times \frac{1}{2}$$

Exact result:

4177936

4177936

sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]

Input:

$$\sqrt{\frac{1}{2^5 \times 2}(2 \times 8192)^2 + \frac{2^5}{2} - 2(2 \times 8192) \times \frac{1}{2}}$$

Exact result:

2044

2044

1/2*sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]-3

Input:

$$\frac{1}{2}\sqrt{\frac{1}{2^5\times 2}(2\times 8192)^2+\frac{2^5}{2}-2\,(2\times 8192)\times\frac{1}{2}}-3$$

Exact result:

1019

1019 result practically equal to the rest mass of Phi meson 1019.445

((((1/2*sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]))))^1/14

Input:

$$\sqrt[14]{\frac{1}{2}\sqrt{\frac{1}{2^5\times 2}(2\times 8192)^2+\frac{2^5}{2}-2\,(2\times 8192)\times\frac{1}{2}}}$$

Result:

$$\sqrt[14]{1022}$$

Decimal approximation:

1.64044161598345453955221116918418945031300222760371454400 6...

$1.6404416159\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

((((1/2*sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]))))^1/14 - (18+4)1/10^3

Input:

$$\sqrt[14]{\frac{1}{2}\sqrt{\frac{1}{2^5\times 2}(2\times 8192)^2+\frac{2^5}{2}-2(2\times 8192)\times\frac{1}{2}}}-(18+4)\times\frac{1}{10^3}$$

Result:

$$\sqrt[14]{1022}-\frac{11}{500}$$

Decimal approximation:

1.618441615983454539552211169184189450313002227603714544006...

1.6184416159…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$\frac{1}{500}\left(500\sqrt[14]{1022}-11\right)$$

$$\frac{1}{500}\left(\sqrt{\left(1000\ \text{root of}\ 1\,000\,000\,000\,000\,000\,000\,000\,x^7+847\,000\,000\,000\,000\,000\,000\,x^6+307\,461\,000\,000\,000\,000\,000\,x^5+62\,004\,635\,000\,000\,000\,000\,x^4+7\,502\,560\,835\,000\,000\,000\,x^3+544\,685\,916\,621\,000\,000\,x^2+21\,968\,998\,637\,047\,000\,x-62\,377\,929\,687\,499\,999\,999\,999\,999\,620\,250\,166\,416\,759\ \text{near}\ x=672.641\right)+121\right)-11\right)$$

27sqrt(((2(((sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]+4))))))+1

Input:

$$27\sqrt{2\left(\sqrt{\frac{1}{2^5\times 2}(2\times 8192)^2+\frac{2^5}{2}-2(2\times 8192)\times\frac{1}{2}}+4\right)+1}$$

Exact result:

1729

1729

This result is very near to the mass of candidate glueball **$f_0(1710)$ scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

(((((27sqrt(((2(((sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]+4))))))+1)))))^1/15

Input:

$$\sqrt[15]{27\sqrt{2\left(\sqrt{\frac{1}{2^5\times 2}(2\times 8192)^2+\frac{2^5}{2}-2(2\times 8192)\times\frac{1}{2}}+4\right)}+1}$$

Result:

$$\sqrt[15]{1729}$$

Decimal approximation:

1.643815228748728130580088031324769514329283143699940172645...

$1.6438152287\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

(((((27sqrt(((2(((sqrt[2^(-5) / 2 (2*8192)^2 + 2^5 / 2 – 2(2*8192)*1/2]+4))))))+1)))))^1/15-26/10^3

Input:

$$\sqrt[15]{27\sqrt{2\left(\sqrt{\frac{1}{2^5\times 2}(2\times 8192)^2+\frac{2^5}{2}-2(2\times 8192)\times\frac{1}{2}}+4\right)}+1}-\frac{26}{10^3}$$

Result:

$$\sqrt[15]{1729} - \frac{13}{500}$$

Decimal approximation:

1.617815228748728130580088031324769514329283143699940172645...

1.6178152287…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$\frac{1}{500}\left(500\sqrt[15]{1729} - 13\right)$$

$$\frac{1}{500}\left(\left(500 \text{ root of } 31\,250\,000\,000\,000\,x^5 + 686\,562\,500\,000\,000\,x^4 + 6\,033\,511\,250\,000\,000\,x^3 + 26\,511\,248\,432\,500\,000\,x^2 + 58\,245\,212\,806\,202\,500\,x - 52\,764\,892\,578\,124\,999\,999\,999\,999\,948\,814\,106\,985\,909\,243 \text{ near } x = 1.11045\times10^6 + 2197\right)\text{^}(1/3) - 13\right)$$

Now, we take:

$$\mathcal{K} = \frac{1}{4}\left[(Q_o + Q_v)(P + W) - 2 \times 16(Q_s + Q_c)\left(\frac{\eta}{\vartheta_4}\right)^2\right]$$

$$\tilde{\mathcal{K}}_0 = \frac{2^5}{4}\left[Q_o(\sqrt{v} - \frac{1}{\sqrt{v}})^2 + Q_v(\sqrt{v} + \frac{1}{\sqrt{v}})^2\right]$$

We perform the following calculation, inserting only Fibonacci numbers:

1/4[(2+3)(5+8)-2*16(13+21)*(1/2)^2]

Input:

$$\frac{1}{4}\left((2+3)(5+8) - 2(16(13+21))\left(\frac{1}{2}\right)^2\right)$$

Exact result:

$$-\frac{207}{4}$$

Decimal form:

−51.75

-51.75

And

2^5 / 4 [2(sqrt2-1/sqrt2)^2+3(sqrt2+1/sqrt2)^2]

Input:

$$\frac{2^5}{4}\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2\right)$$

Result:

116

116

From the two expressions, we have that:

2^5 / 4 [2(sqrt2-1/sqrt2)^2+3(sqrt2+1/sqrt2)^2]+1/4[(2+3)(5+8)-2*((16(13+21)))*(1/2)^2]

Input:

$$\frac{2^5}{4}\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2\right)+\frac{1}{4}\left((2+3)(5+8)-2(16(13+21))\left(\frac{1}{2}\right)^2\right)$$

Result:

$$\frac{257}{4}$$

Decimal form:

64.25

64.25 ≈ 64

From which:

27((((2^5 / 4 [2(sqrt2-1/sqrt2)^2+3(sqrt2+1/sqrt2)^2]+1/4[(2+3)(5+8)-2*((16(13+21)))*(1/2)^2])))-18/Pi

Input:

$$27\left(\frac{2^5}{4}\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2\right)+\frac{1}{4}\left((2+3)(5+8)-2(16(13+21))\left(\frac{1}{2}\right)^2\right)\right)-\frac{18}{\pi}$$

Result:

$$27\left(8\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)-\frac{207}{4}\right)-\frac{18}{\pi}$$

Decimal approximation:

1729.020422048691767912320184518589482966759452753343567845...

1729.0204220486…

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

Property:

$$27\left(-\frac{207}{4}+8\left(2\left(-\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)\right)-\frac{18}{\pi}$$ is a transcendental number

Alternate forms:

$$\frac{9(771\pi-8)}{4\pi}$$

$$\frac{6939}{4}-\frac{18}{\pi}$$

$$-\frac{9(8-771\pi)}{4\pi}$$

Series representations:

$$27\left(\frac{1}{4}\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2\right)2^5+\frac{1}{4}\left((2+3)(5+8)-16(13+21)\,2\left(\frac{1}{2}\right)^2\right)\right)-$$
$$\frac{18}{\pi}=\left(9\left(480\pi-8\sqrt{z_0}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2-\right.\right.$$
$$429\pi\sqrt{z_0}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2+$$
$$\left.\left.480\pi\sqrt{z_0}^{\,4}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^4\right)\right)\Big/$$
$$\left(4\pi\sqrt{z_0}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2\right)$$

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

$$27\left(\frac{1}{4}\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2\right)2^5+\frac{1}{4}\left((2+3)(5+8)-16(13+21)\,2\left(\frac{1}{2}\right)^2\right)\right)-$$
$$\frac{18}{\pi}=\left(9\left(480\pi-8\exp^2\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2-\right.\right.$$
$$429\pi\exp^2\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2+$$
$$\left.\left.480\pi\exp^4\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}^{\,4}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^4\right)\right)\Big/$$
$$\left(4\pi\exp^2\left(i\pi\left\lfloor\frac{\arg(2-x)}{2\pi}\right\rfloor\right)\sqrt{x}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2\right)$$

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

$$27\left(\frac{1}{4}\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\sqrt{2}+\frac{1}{\sqrt{2}}\right)^2\right)2^5+\frac{1}{4}\left((2+3)(5+8)-16(13+21)2\left(\frac{1}{2}\right)^2\right)\right)-$$
$$\frac{18}{\pi}=\left(9\left(\frac{1}{z_0}\right)^{-[\arg(2-z_0)/(2\pi)]}z_0^{-1-[\arg(2-z_0)/(2\pi)]}\right.$$
$$\left(480\pi-8\left(\frac{1}{z_0}\right)^{[\arg(2-z_0)/(2\pi)]}z_0^{1+[\arg(2-z_0)/(2\pi)]}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2-\right.$$
$$429\pi\left(\frac{1}{z_0}\right)^{[\arg(2-z_0)/(2\pi)]}z_0^{1+[\arg(2-z_0)/(2\pi)]}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2+$$
$$480\pi\left(\frac{1}{z_0}\right)^{2[\arg(2-z_0)/(2\pi)]}z_0^{2+2[\arg(2-z_0)/(2\pi)]}$$
$$\left.\left.\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^4\right)\right)\Big/\left(4\pi\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2\right)$$

From the result, we obtain:

[27 (-207/4 + 8 (2 (-1/sqrt(2) + sqrt(2))^2 + 3 (1/sqrt(2) + sqrt(2))^2)) - 18/π]^1/15

Input:

$$\sqrt[15]{27\left(-\frac{207}{4}+8\left(2\left(-\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)\right)-\frac{18}{\pi}}$$

Decimal approximation:

1.643816523134292199582266709319684019743224557535663310093...

$1.6438165231\ldots \approx \zeta(2)=\frac{\pi^2}{6}=1.644934\ldots$

Property:

$$\sqrt[15]{27\left(-\frac{207}{4}+8\left(2\left(-\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)\right)-\frac{18}{\pi}}$$

is a transcendental number

Alternate forms:

$$\sqrt[15]{\frac{6939}{4}-\frac{18}{\pi}}$$

$$\left(\frac{3}{2}\right)^{2/15}\sqrt[15]{771-\frac{8}{\pi}}$$

$$\left(\frac{3}{2}\right)^{2/15}\sqrt[15]{\frac{771\,\pi-8}{\pi}}$$

All 15th roots of 27 (8 (2 (sqrt(2) - 1/sqrt(2))^2 + 3 (1/sqrt(2) + sqrt(2))^2) - 207/4) - 18/π:

$$\sqrt[15]{27\left(8\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)-\frac{207}{4}\right)-\frac{18}{\pi}}\;e^{0}\approx 1.64382$$

(real, principal root)

$$\sqrt[15]{27\left(8\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)-\frac{207}{4}\right)-\frac{18}{\pi}}\;e^{(2i\pi)/15}\approx 1.5017+0.6686\,i$$

$$\sqrt[15]{27\left(8\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)-\frac{207}{4}\right)-\frac{18}{\pi}}\;e^{(4i\pi)/15}\approx 1.0999+1.2216\,i$$

$$\sqrt[15]{27\left(8\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)-\frac{207}{4}\right)-\frac{18}{\pi}}\;e^{(2i\pi)/5}\approx 0.5080+1.5634\,i$$

$$\sqrt[15]{27\left(8\left(2\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)-\frac{207}{4}\right)-\frac{18}{\pi}}\;e^{(8i\pi)/15}$$

$$\approx -0.17183+1.63481\,i$$

Series representations:

$$\sqrt[15]{27\left(-\frac{207}{4}+8\left(2\left(-\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)\right)-\frac{18}{\pi}}=$$

$$\left(\frac{3}{2}\right)^{2/15}\left(\left(480\,\pi-8\sqrt{z_0}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k\,z_0^{-k}}{k!}\right)^2-\right.\right.$$

$$429\,\pi\sqrt{z_0}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k\,z_0^{-k}}{k!}\right)^2+$$

$$\left.\left.480\,\pi\sqrt{z_0}^{\,4}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k\,z_0^{-k}}{k!}\right)^4\right)\Big/$$

$$\left(\pi\sqrt{z_0}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k\,z_0^{-k}}{k!}\right)^2\right)\wedge(1/15)$$

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

$$\sqrt[15]{27\left(-\frac{207}{4}+8\left(2\left(-\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)\right)-\frac{18}{\pi}}=$$

$$\left(\frac{3}{2}\right)^{2/15}\left(\left(480\,\pi-8\exp^2\left(i\,\pi\left\lfloor\frac{\arg(2-x)}{2\,\pi}\right\rfloor\right)\sqrt{x}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2-\right.\right.$$

$$429\,\pi\exp^2\left(i\,\pi\left\lfloor\frac{\arg(2-x)}{2\,\pi}\right\rfloor\right)\sqrt{x}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2+$$

$$\left.\left.480\,\pi\exp^4\left(i\,\pi\left\lfloor\frac{\arg(2-x)}{2\,\pi}\right\rfloor\right)\sqrt{x}^{\,4}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^4\right)\Big/$$

$$\left(\pi\exp^2\left(i\,\pi\left\lfloor\frac{\arg(2-x)}{2\,\pi}\right\rfloor\right)\sqrt{x}^{\,2}\left(\sum_{k=0}^{\infty}\frac{(-1)^k(2-x)^k\,x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)^2\right)\wedge$$

$(1/15)$ for $(x\in\mathbb{R}\ \text{and}\ x<0)$

$$\sqrt[15]{27\left(-\frac{207}{4}+8\left(2\left(-\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2+3\left(\frac{1}{\sqrt{2}}+\sqrt{2}\right)^2\right)\right)-\frac{18}{\pi}}=$$

$$\left(\frac{3}{2}\right)^{2/15}\left(\left(\left(\frac{1}{z_0}\right)^{-\lfloor \arg(2-z_0)/(2\pi)\rfloor} z_0^{-1-\lfloor \arg(2-z_0)/(2\pi)\rfloor}\left(480\pi-\right.\right.\right.$$

$$8\left(\frac{1}{z_0}\right)^{\lfloor \arg(2-z_0)/(2\pi)\rfloor} z_0^{1+\lfloor \arg(2-z_0)/(2\pi)\rfloor}\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2-$$

$$429\pi\left(\frac{1}{z_0}\right)^{\lfloor \arg(2-z_0)/(2\pi)\rfloor} z_0^{1+\lfloor \arg(2-z_0)/(2\pi)\rfloor}$$

$$\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2+480\pi\left(\frac{1}{z_0}\right)^{2\lfloor \arg(2-z_0)/(2\pi)\rfloor}$$

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

$$\left(\pi\left(\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(2-z_0)^k z_0^{-k}}{k!}\right)^2\right)\Bigg)\text{^}(1/15)$$

Integral representation:

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

Now, we have:

$$Q'_o = V_4O_4 - S_4S_4 \quad Q'_v = O_4V_4 - C_4C_4$$

$$\tilde{\mathcal{A}}_{(unl)} = \frac{2^{-5}}{4}\left[(Q_o+Q_v)(N^2vW+D^2\frac{P}{v})+2ND(Q'_o-Q'_v)\right]$$

- The $RR\ ND$ contribution has been **inverted**. All RR tadpoles can be solved, while the $NS-NS$ ones give a contribution to the **vacuum energy** localized on the anti-branes.

we obtain:

2^(-5) / 4 [(2+3)(4^2*2*5+13^2*8/2)+2*4*13(34-21)]

Input:

$$\frac{1}{2^5 \times 4}\left((2+3)\left(4^2 \times 2 \times 5 + 13^2 \times \frac{8}{2}\right) + 2 \times 4 \times 13\,(34-21)\right)$$

Exact result:

$$\frac{1383}{32}$$

Decimal form:

43.21875

43.21875

From which:

3 * 2^(-5) / 4 [(2+3)(4^2*2*5+13^2*8/2)+2*4*13(34-21)] – 4

Input:

$$3 \times \frac{1}{2^5 \times 4}\left((2+3)\left(4^2 \times 2 \times 5 + 13^2 \times \frac{8}{2}\right) + 2 \times 4 \times 13\,(34-21)\right) - 4$$

Exact result:

$$\frac{4021}{32}$$

Decimal form:

125.65625

125.65625 result very near to the Higgs boson mass 125.18 GeV

3 * 2^(-5) / 4 [(2+3)(4^2*2*5+13^2*8/2)+2*4*13(34-21)] +11-1

Input:

$$3 \times \frac{1}{2^5 \times 4}\left((2+3)\left(4^2 \times 2 \times 5 + 13^2 \times \frac{8}{2}\right) + 2 \times 4 \times 13\,(34-21)\right) + 11 - 1$$

Exact result:

$$\frac{4469}{32}$$

Decimal form:

139.65625

139.65625 result practically equal to the rest mass of Pion meson 139.57 MeV

27*1/2*((((3 * 2^(-5) / 4 [(2+3)(4^2*2*5+13^2*8/2)+2*4*13(34-21)] -1))))-8

Input:

$$27\times\frac{1}{2}\left(3\times\frac{1}{2^5\times4}\left((2+3)\left(4^2\times2\times5+13^2\times\frac{8}{2}\right)+2\times4\times13\,(34-21)\right)-1\right)-8$$

Exact result:

$$\frac{110\,647}{64}$$

Decimal form:

1728.859375

1728.859375

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

((((27*1/2*((((3 * 2^(-5) / 4 [(2+3)(4^2*2*5+13^2*8/2)+2*4*13(34-21)] -1))))-8))))^1/15

Input:

$$\sqrt[15]{27\times\frac{1}{2}\left(3\times\frac{1}{2^5\times4}\left((2+3)\left(4^2\times2\times5+13^2\times\frac{8}{2}\right)+2\times4\times13\,(34-21)\right)-1\right)-8}$$

Result:

$$\frac{\sqrt[15]{110\,647}}{2^{2/5}}$$

Decimal approximation:

1.643806315300073968953776956276576599724408207724375377699...

$1.6438063153\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Alternate form:

$$\frac{1}{2}\left(2^{3/5}\sqrt[15]{110\,647}\right)$$

Now, we have:

$$\mathcal{A} = \left(\frac{n_1^2+n_2^2+n_3^2}{2}\right)\chi_1 + n_2(n_1+n_3)\chi_2 + \left(\frac{n_2^2}{2}+n_1 n_3\right)\chi_3$$

For n = 2, 4, 6; m = 32+n;

χ_1 , χ_2 , χ_3 = 1

((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)

Input:

$$\frac{1}{2}\left(2^2+4^2+6^2\right)+4\,(2+6)+\left(\frac{4^2}{2}+2\times 6\right)$$

Result:

80

80

And

$$\mathcal{M} = \pm \left[\frac{n_2}{2} \hat{\chi}_1 + \frac{n_2 + m + \bar{m}}{2} \hat{\chi}_3 \right]$$

4/2+1/2(4+32+2+32+2)

Input:

$$\frac{4}{2} + \frac{1}{2}(4 + 32 + 2 + 32 + 2)$$

Exact result:

38

38

From the two equations, we obtain also:

[((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)] + [4/2+1/2(4+32+2+32+2)] + 7

where 7 is a Lucas number

Input:

$$\left(\frac{1}{2}(2^2 + 4^2 + 6^2) + 4(2 + 6) + \left(\frac{4^2}{2} + 2 \times 6\right)\right) + \left(\frac{4}{2} + \frac{1}{2}(4 + 32 + 2 + 32 + 2)\right) + 7$$

Exact result:

125

125 result very near to the Higgs boson mass 125.18 GeV

[((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)] + [4/2+1/2(4+32+2+32+2)] + 21

where 21 is a Fibonacci number

Input:

$$\left(\frac{1}{2}\left(2^2+4^2+6^2\right)+4\,(2+6)+\left(\frac{4^2}{2}+2\times 6\right)\right)+\left(\frac{4}{2}+\frac{1}{2}\,(4+32+2+32+2)\right)+21$$

Exact result:

139

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

27*1/2(([((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)] + [4/2+1/2(4+32+2+32+2)] + 11-1))+1

Input:

$$27\times\frac{1}{2}\left(\left(\frac{1}{2}\left(2^2+4^2+6^2\right)+4\,(2+6)+\left(\frac{4^2}{2}+2\times 6\right)\right)+\left(\frac{4}{2}+\frac{1}{2}\,(4+32+2+32+2)\right)+11-1\right)+1$$

Exact result:

1729

1729

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

(((27*1/2(([((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)] + [4/2+1/2(4+32+2+32+2)] + 11-1))+1)))^1/15

Input:

$$\left(27\times\frac{1}{2}\left(\left(\frac{1}{2}\left(2^2+4^2+6^2\right)+4\,(2+6)+\left(\frac{4^2}{2}+2\times 6\right)\right)+\left(\frac{4}{2}+\frac{1}{2}\,(4+32+2+32+2)\right)+11-1\right)+1\right)\text{^}\,(1/15)$$

Result:

$\sqrt[15]{1729}$

Decimal approximation:

1.643815228748728130580088031324769514329283143699940172645...

$1.6438152287\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

We have that:

$$\mathcal{M} = \frac{1}{2}(\epsilon_1 \chi_1 + \epsilon_3 \chi_3)$$

$$2\tilde{\mathcal{M}} = \left[\epsilon_1 \sin(\frac{\pi}{8}) + \epsilon_3 \cos(\frac{\pi}{8})\right]\chi_1 + \left[\epsilon_1 \cos(\frac{\pi}{8}) - \epsilon_3 \sin(\frac{\pi}{8})\right]\chi_3$$

2M = [1*sin(Pi/8)+2*cos(Pi/8)] + [1*cos(Pi/8)-2*sin(Pi/8)]

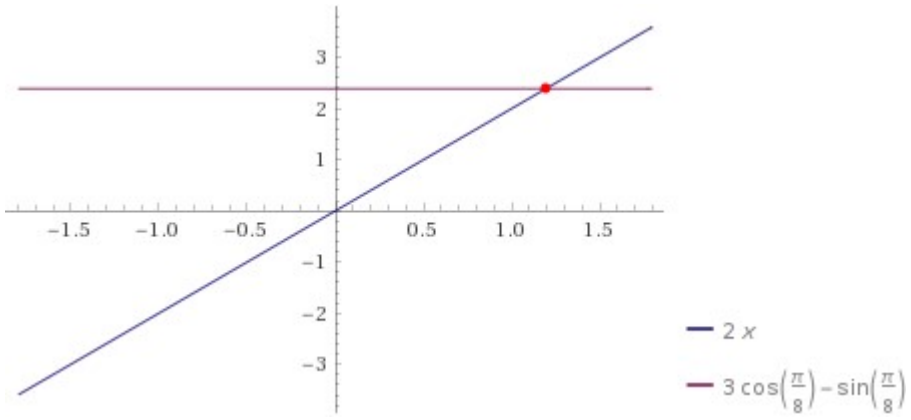
Input:

$$2x = \left(1\sin\left(\frac{\pi}{8}\right) + 2\cos\left(\frac{\pi}{8}\right)\right) + \left(1\cos\left(\frac{\pi}{8}\right) - 2\sin\left(\frac{\pi}{8}\right)\right)$$

Exact result:

$$2x = 3\cos\left(\frac{\pi}{8}\right) - \sin\left(\frac{\pi}{8}\right)$$

Plot:



Alternate forms:

$$2x = \sqrt{\frac{1}{2}\left(10 + \sqrt{2}\right)}$$

$$2x + \sin\left(\frac{\pi}{8}\right) = 3\cos\left(\frac{\pi}{8}\right)$$

$$2x + \sin\left(\frac{\pi}{8}\right) - 3\cos\left(\frac{\pi}{8}\right) = 0$$

Solution:

$x \approx 1.1945$

1.1945

[1*sin(Pi/8)+2*cos(Pi/8)] + [1*cos(Pi/8)-2*sin(Pi/8)]

Input:

$$\left(1\sin\left(\frac{\pi}{8}\right) + 2\cos\left(\frac{\pi}{8}\right)\right) + \left(1\cos\left(\frac{\pi}{8}\right) - 2\sin\left(\frac{\pi}{8}\right)\right)$$

Exact result:

$$3\cos\left(\frac{\pi}{8}\right) - \sin\left(\frac{\pi}{8}\right)$$

Decimal approximation:

2.388955165168770496656089584159965993705905315105300416911...

2.388955165 ≈ 2*1.1945 = 2.389

Alternate forms:

$$\sqrt{\frac{1}{2}\left(10 + \sqrt{2}\right)}$$

$$\left(-\frac{1}{2} + \frac{i}{2}\right)(-1)^{7/8}\left((2+i) + (1+2i)\sqrt[4]{-1}\right)$$

$$\left(\frac{3}{2} - \frac{i}{2}\right)e^{-(i\pi)/8} + \left(\frac{3}{2} + \frac{i}{2}\right)e^{(i\pi)/8}$$

Alternative representations:

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=3\cosh\left(-\frac{i\pi}{8}\right)+\cos\left(\frac{\pi}{2}+\frac{\pi}{8}\right)$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=3\cosh\left(\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=3\cosh\left(-\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)$$

Series representations:

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\left(\left(-\frac{3\pi}{8}\right)^{2k}-3\left(\frac{\pi}{8}\right)^{2k}\right)}{(2k)!}$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\sum_{k=0}^{\infty}\frac{\left((-1)^{1+k}+9^{1+k}\,e^{3ik\pi}\right)\left(\frac{8}{\pi}\right)^{-1-2k}}{(1+2k)!}$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\,8^{-1-2k}\,\pi^{2k}\,(\pi\,(2k)!-24\,(1+2k)!)}{(2k)!\,(1+2k)!}$$

Integral representations:

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{i\,e^{-\pi^2/(256\,s)+s}\,(\pi-48\,s)}{32\sqrt{\pi}\;s^{3/2}}\,ds\quad\text{for}\ \gamma>0$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=-\frac{12\,i\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-\pi^2/(256\,s)+s}}{\sqrt{s}}\,ds+\pi^{3/2}\int_0^1\cos\left(\frac{\pi\,t}{8}\right)dt}{8\sqrt{\pi}}\quad\text{for}\ \gamma>0$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\frac{1}{32}\,i\left(\sqrt{\pi}\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{e^{-\pi^2/(256\,s)+s}}{s^{3/2}}\,ds+96\,i\int_{\frac{\pi}{2}}^{\frac{\pi}{8}}\sin(t)\,dt\right)\quad\text{for}\ \gamma>0$$

Multiple-argument formulas:

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\frac{1}{2}\left((3+i)\sqrt[8]{-1}\ -(3-i)(-1)^{7/8}\right)$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=-\frac{1}{2}(-1)^{7/8}\left((3-i)+(1+2i)\sqrt{2}\right)$$

$$\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)=\frac{1}{2}\left(-(-1)^{3/8}+(-1)^{5/8}+6\cos\left(\frac{\pi}{8}\right)\right)$$

2 (((((((([1*sin(Pi/8)+2*cos(Pi/8)] + [1*cos(Pi/8)-2*sin(Pi/8)]))^5-13-4/5)))) – 3

Input:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3$$

Exact result:

$$2\left(\left(3\cos\left(\frac{\pi}{8}\right)-\sin\left(\frac{\pi}{8}\right)\right)^5-\frac{69}{5}\right)-3$$

Decimal approximation:

125.021641368436621321162631941309986085903286087068252642 1...

125.021641368… result very near to the Higgs boson mass 125.18 GeV

Alternate forms:

$$-\frac{153}{5}-11\sin\left(\frac{\pi}{8}\right)+173\cos\left(\frac{\pi}{8}\right)$$

$$\frac{1}{5}\left(-153-55\sin\left(\frac{\pi}{8}\right)+865\cos\left(\frac{\pi}{8}\right)\right)$$

$$\frac{1}{10}\left(5\sqrt{2\left(30\,050+13\,001\sqrt{2}\right)}-306\right)$$

Alternative representations:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-3+2\left(-13-\frac{4}{5}+\left(3\cosh\left(-\frac{i\pi}{8}\right)+\cos\left(\frac{\pi}{2}+\frac{\pi}{8}\right)\right)^5\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-3+2\left(-13-\frac{4}{5}+\left(3\cosh\left(\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)^5\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-3+2\left(-13-\frac{4}{5}+\left(3\cosh\left(-\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)^5\right)$$

Series representations:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-\frac{153}{5}+2\left(\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\left(\left(-\frac{3\pi}{8}\right)^{2k}-3\left(\frac{\pi}{8}\right)^{2k}\right)}{(2k)!}\right)^5$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-\frac{153}{5}-2\left(\sum_{k=0}^{\infty}\frac{\left((-1)^k-9^{1+k}\,e^{3ik\pi}\right)\left(\frac{8}{\pi}\right)^{-1-2k}}{(1+2k)!}\right)^5$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-\frac{153}{5}+2\left(\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\,8^{-1-2k}\,\pi^{2k}\,(\pi\,(2k)!-24\,(1+2k)!)}{(2k)!\,(1+2k)!}\right)^5$$

Multiple-argument formulas:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-\frac{153}{5}-\frac{1}{2}(-1)^{7/8}\left((173-11\,i)+(81+92\,i)\sqrt{2}\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-\frac{153}{5}+2\left(3\cos\left(\frac{\pi}{8}\right)-\sin\left(\frac{\pi}{8}\right)\right)^5$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)-3=$$
$$-\frac{153}{5}-2\left(-3+6\sin^2\left(\frac{\pi}{16}\right)+\sin\left(\frac{\pi}{8}\right)\right)^5$$

2 (((((((([1*sin(Pi/8)+2*cos(Pi/8)] + [1*cos(Pi/8)-2*sin(Pi/8)])))^5-13-4/5))))+11

Input:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11$$

Exact result:

$$11+2\left(\left(3\cos\left(\frac{\pi}{8}\right)-\sin\left(\frac{\pi}{8}\right)\right)^5-\frac{69}{5}\right)$$

Decimal approximation:

139.021641368436621321162631941309986085903286087068252642 1...

139.02164136… result practically equal to the rest mass of Pion meson 139.57 MeV

Alternate forms:

$$-\frac{83}{5}-11\sin\left(\frac{\pi}{8}\right)+173\cos\left(\frac{\pi}{8}\right)$$

$$\frac{1}{5}\left(-83-55\sin\left(\frac{\pi}{8}\right)+865\cos\left(\frac{\pi}{8}\right)\right)$$

$$\frac{1}{10}\left(5\sqrt{2\left(30\,050+13\,001\sqrt{2}\right)}-166\right)$$

Alternative representations:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$11+2\left(-13-\frac{4}{5}+\left(3\cosh\left(-\frac{i\pi}{8}\right)+\cos\left(\frac{\pi}{2}+\frac{\pi}{8}\right)\right)^5\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$11+2\left(-13-\frac{4}{5}+\left(3\cosh\left(\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)^5\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$11+2\left(-13-\frac{4}{5}+\left(3\cosh\left(-\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)^5\right)$$

Series representations:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$11+2\left(-\frac{69}{5}+\left(\sum_{k=0}^{\infty}\frac{(-1)^k\,8^{-1-2k}\left(-1+(-1)^{2k}\,9^{1+k}\right)\pi^{1+2k}}{(1+2k)!}\right)^5\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$-\frac{83}{5}+2\left(\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\left(\left(-\frac{3\pi}{8}\right)^{2k}-3\left(\frac{\pi}{8}\right)^{2k}\right)}{(2k)!}\right)^5$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$-\frac{83}{5}+2\left(\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\,8^{-1-2k}\,\pi^{2k}\,(\pi\,(2k)!-24\,(1+2k)!)}{(2k)!\,(1+2k)!}\right)^5$$

Multiple-argument formulas:

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$-\frac{83}{5}-\frac{1}{2}(-1)^{7/8}\left((173-11\,i)+(81+92\,i)\sqrt{2}\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$11+2\left(-\frac{69}{5}+\left(3\cos\left(\frac{\pi}{8}\right)-2\cos\left(\frac{\pi}{16}\right)\sin\left(\frac{\pi}{16}\right)\right)^5\right)$$

$$2\left(\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)^5-13-\frac{4}{5}\right)+11=$$
$$11+2\left(-\frac{69}{5}+\left(3\left(-1+2\cos^2\left(\frac{\pi}{16}\right)\right)-2\cos\left(\frac{\pi}{16}\right)\sin\left(\frac{\pi}{16}\right)\right)^5\right)$$

(((27*1/2(([((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)] + [4/2+1/2(4+32+2+32+2)] + 11-1))+1)))

Input:

$$27\times\frac{1}{2}\left(\left(\frac{1}{2}\left(2^2+4^2+6^2\right)+4\left(2+6\right)+\left(\frac{4^2}{2}+2\times6\right)\right)+\left(\frac{4}{2}+\frac{1}{2}\left(4+32+2+32+2\right)\right)+11-1\right)+1$$

Exact result:

1729

1729

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

(((27*1/2(([((2^2+4^2+6^2)/2)+4(2+6)+(4^2/2+2*6)] + [4/2+1/2(4+32+2+32+2)] + 11-1))+1)))^1/15

Input:

$$\left(27\times\frac{1}{2}\left(\left(\frac{1}{2}\left(2^2+4^2+6^2\right)+4\left(2+6\right)+\left(\frac{4^2}{2}+2\times6\right)\right)+\left(\frac{4}{2}+\frac{1}{2}\left(4+32+2+32+2\right)\right)+11-1\right)+1\right)\text{^}\left(1/15\right)$$

Result:

$\sqrt[15]{1729}$

Decimal approximation:

1.643815228748728130580088031324769514329283143699940172645...

$1.64381522874\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

Thence:

$$2\tilde{\mathcal{M}} = \left[\epsilon_1 \sin\left(\frac{\pi}{8}\right) + \epsilon_3 \cos\left(\frac{\pi}{8}\right)\right]\chi_1 + \left[\epsilon_1 \cos\left(\frac{\pi}{8}\right) - \epsilon_3 \sin\left(\frac{\pi}{8}\right)\right]\chi_3$$

2.388955165168770496656089584159965993705905315105300416911...

$$\mathcal{M} = \frac{1}{2}\left(\epsilon_1 \chi_1 + \epsilon_3 \chi_3\right)$$

1/2(1+2) = 3/2

We perform the following calculation:

5*3/2*(((([1*sin(Pi/8)+2*cos(Pi/8)] + [1*cos(Pi/8)-2*sin(Pi/8)]))))

Input:

$$5 \times \frac{3}{2}\left(\left(1\sin\left(\frac{\pi}{8}\right) + 2\cos\left(\frac{\pi}{8}\right)\right) + \left(1\cos\left(\frac{\pi}{8}\right) - 2\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Exact result:

$$\frac{15}{2}\left(3\cos\left(\frac{\pi}{8}\right) - \sin\left(\frac{\pi}{8}\right)\right)$$

Decimal approximation:

17.917163738765778724920671881199744952794289863289753126 83...

17.917163738…

Alternate forms:

$$\frac{15}{2}\sqrt{\frac{1}{2}\left(10+\sqrt{2}\right)}$$

$$\frac{45}{2}\cos\left(\frac{\pi}{8}\right)-\frac{15}{2}\sin\left(\frac{\pi}{8}\right)$$

$$\left(-\frac{15}{4}+\frac{15\,i}{4}\right)(-1)^{7/8}\left((2+i)+(1+2\,i)\sqrt[4]{-1}\right)$$

Alternative representations:

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3=\frac{15}{2}\left(3\cosh\left(-\frac{i\,\pi}{8}\right)+\cos\left(\frac{\pi}{2}+\frac{\pi}{8}\right)\right)$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3=\frac{15}{2}\left(3\cosh\left(\frac{i\,\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3=\frac{15}{2}\left(3\cosh\left(-\frac{i\,\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)$$

Series representations:

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3=\sum_{k=0}^{\infty}-\frac{15\,(-1)^k\,2^{-1-6k}\left(-3+(-3)^{2k}\right)\pi^{2k}}{(2k)!}$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3=\sum_{k=0}^{\infty}-\frac{15\times4^{-2-3k}\left((-1)^k-9^{1+k}\,e^{3\,i\,k\,\pi}\right)\pi^{1+2k}}{(1+2k)!}$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3=\sum_{k=0}^{\infty}-\frac{15\,(-1)^k\,4^{-2-3k}\,\pi^{2k}\,(\pi\,(2k)!-24\,(1+2k)!)}{(2k)!\,(1+2k)!}$$

Integral representations:

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3 = \int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{15\,i\,e^{-\pi^2/(256\,s)+s}\,(\pi-48\,s)}{64\sqrt{\pi}\;s^{3/2}}\,ds \quad \text{for } \gamma>0$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3 = -\frac{15\left(12\,i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(256\,s)+s}}{\sqrt{s}}\,ds+\pi^{3/2}\int_0^1\cos\left(\frac{\pi\,t}{8}\right)dt\right)}{16\sqrt{\pi}} \quad \text{for } \gamma>0$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3 = \frac{15}{64}\,i\left(\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(256\,s)+s}}{s^{3/2}}\,ds+96\,i\int_{\frac{\pi}{2}}^{\frac{\pi}{8}}\sin(t)\,dt\right) \quad \text{for } \gamma>0$$

Multiple-argument formulas:

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3 = \frac{1}{4}\left((45+15\,i)\sqrt[8]{-1}\;-(45-15\,i)(-1)^{7/8}\right)$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3 = -\frac{15}{4}(-1)^{7/8}\left((3-i)+(1+2\,i)\sqrt{2}\right)$$

$$\frac{1}{2}\left(5\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)\right)3 = \frac{15}{4}\left(-(-1)^{3/8}+(-1)^{5/8}+6\cos\left(\frac{\pi}{8}\right)\right)$$

From which:

29*1/((((5*3/2*(((([1*sin(Pi/8)+2*cos(Pi/8)] + [1*cos(Pi/8)-2*sin(Pi/8)]))))))))

Input:

$$29 \times \frac{1}{5 \times \frac{3}{2}\left(\left(1 \sin\left(\frac{\pi}{8}\right)+2 \cos\left(\frac{\pi}{8}\right)\right)+\left(1 \cos\left(\frac{\pi}{8}\right)-2 \sin\left(\frac{\pi}{8}\right)\right)\right)}$$

Exact result:

$$\frac{58}{15\left(3 \cos\left(\frac{\pi}{8}\right)-\sin\left(\frac{\pi}{8}\right)\right)}$$

Decimal approximation:

1.6185597465549344181070203980240820380808065519241173330 70...

1.6185597465…. result that is a very good approximation to the value of the golden ratio 1.618033988749...

Alternate forms:

$$\frac{58 \sqrt{10-\sqrt{2}}}{105}$$

$$-\frac{58}{15\left(\sin\left(\frac{\pi}{8}\right)-3 \cos\left(\frac{\pi}{8}\right)\right)}$$

$$\frac{58}{45 \cos\left(\frac{\pi}{8}\right)-15 \sin\left(\frac{\pi}{8}\right)}$$

Alternative representations:

$$\frac{29}{\frac{5}{2} \times 3\left(\left(1 \sin\left(\frac{\pi}{8}\right)+2 \cos\left(\frac{\pi}{8}\right)\right)+\left(1 \cos\left(\frac{\pi}{8}\right)-2 \sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{29}{\frac{15}{2}\left(3 \cosh\left(-\frac{i \pi}{8}\right)+\cos\left(\frac{\pi}{2}+\frac{\pi}{8}\right)\right)}$$

$$\frac{29}{\frac{5}{2} \times 3\left(\left(1 \sin\left(\frac{\pi}{8}\right)+2 \cos\left(\frac{\pi}{8}\right)\right)+\left(1 \cos\left(\frac{\pi}{8}\right)-2 \sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{29}{\frac{15}{2}\left(3 \cosh\left(\frac{i \pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)}$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{29}{\frac{15}{2}\left(3\cosh\left(-\frac{i\pi}{8}\right)-\cos\left(\frac{\pi}{2}-\frac{\pi}{8}\right)\right)}$$

Series representations:

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{58}{15\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\left(\left(-\frac{3\pi}{8}\right)^{2k}-3\left(\frac{\pi}{8}\right)^{2k}\right)}{(2k)!}}$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=-\frac{58}{15\sum_{k=0}^{\infty}\frac{\left((-1)^{k}-9^{1+k}e^{3ik\pi}\right)\left(\frac{8}{\pi}\right)^{-1-2k}}{(1+2k)!}}$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{58}{15\sum_{k=0}^{\infty}\frac{(-1)^{1+k}\,8^{-1-2k}\,\pi^{2k}\,(\pi\,(2k)!-24\,(1+2k)!)}{(2k)!\,(1+2k)!}}$$

Integral representations:

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=-\frac{1856\,i\sqrt{\pi}}{\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{15\,e^{-\pi^2/(256\,s)+s}\,(\pi-48\,s)}{s^{3/2}}\,ds}\quad\text{for}\ \gamma>0$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{1856}{15\left(i\sqrt{\pi}\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(256\,s)+s}}{s^{3/2}}\,ds-96\int_{\frac{\pi}{2}}^{\frac{\pi}{8}}\sin(t)\,dt\right)}\quad\text{for}\ \gamma>0$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=-\frac{464\sqrt{\pi}}{15\left(12\,i\int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{e^{-\pi^2/(256\,s)+s}}{\sqrt{s}}\,ds+\pi^{3/2}\int_{0}^{1}\cos\left(\frac{\pi t}{8}\right)dt\right)}\quad\text{for}\ \gamma>0$$

Multiple-argument formulas:

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{116\sqrt[8]{-1}}{15\left((3-i)+(1+2i)\sqrt{2}\right)}$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{58}{15\left(3\left(-1+2\cos^2\left(\frac{\pi}{16}\right)\right)-\sin\left(\frac{\pi}{8}\right)\right)}$$

$$\frac{29}{\frac{5}{2}\times 3\left(\left(1\sin\left(\frac{\pi}{8}\right)+2\cos\left(\frac{\pi}{8}\right)\right)+\left(1\cos\left(\frac{\pi}{8}\right)-2\sin\left(\frac{\pi}{8}\right)\right)\right)}=\frac{58}{15\left(3\left(1-2\sin^2\left(\frac{\pi}{16}\right)\right)-\sin\left(\frac{\pi}{8}\right)\right)}$$

We have that:

- **General** $\mathcal{A}\ (\ \epsilon_1 \to n_1 + n_3 - n_2,\ \epsilon_2 \to n_2)$:

$$\mathcal{A} = \frac{1}{2}\left[(n_1^2+n_2^2+n_3^2)\chi_1+2n_2(n_1+n_3)\chi_2+(n_2^2+2n_1n_3)\chi_3\right]$$

For n = 2, 4, 6 we obtain:

1/2[(2^2+4^2+6^2)+2*4(2+6)+(4^2+2*2*6)]

Input:

$$\frac{1}{2}\left((2^2+4^2+6^2)+2\times 4\,(2+6)+(4^2+2\times 2\times 6)\right)$$

Exact result:

80

80

From which:

108*1/5*1/2[(2^2+4^2+6^2)+2*4(2+6)+(4^2+2*2*6)]

Input:

$$108 \times \frac{1}{5} \times \frac{1}{2}\left(\left(2^2+4^2+6^2\right)+2 \times 4\,(2+6)+\left(4^2+2 \times 2 \times 6\right)\right)$$

Exact result:

1728

1728

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

2*1/2[(2^2+4^2+6^2)+2*4(2+6)+(4^2+2*2*6)]-21

Input:

$$2 \times \frac{1}{2}\left(\left(2^2+4^2+6^2\right)+2 \times 4\,(2+6)+\left(4^2+2 \times 2 \times 6\right)\right)-21$$

Exact result:

139

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

2*1/2[(2^2+4^2+6^2)+2*4(2+6)+(4^2+2*2*6)]-34

Input:

$$2 \times \frac{1}{2}\left(\left(2^2+4^2+6^2\right)+2 \times 4\,(2+6)+\left(4^2+2 \times 2 \times 6\right)\right)-34$$

Exact result:

126

126 result very near to the Higgs boson mass 125.18 GeV

((((108*1/5*1/2[(2^2+4^2+6^2)+2*4(2+6)+(4^2+2*2*6)])))^1/15

Input:

$$\sqrt[15]{108 \times \frac{1}{5} \times \frac{1}{2}\left(\left(2^2+4^2+6^2\right)+2 \times 4\,(2+6)+\left(4^2+2 \times 2 \times 6\right)\right)}$$

Result:

$$2^{2/5}\sqrt[5]{3}$$

Decimal approximation:

1.643751829517225762308497936230979517383492589945475200411...

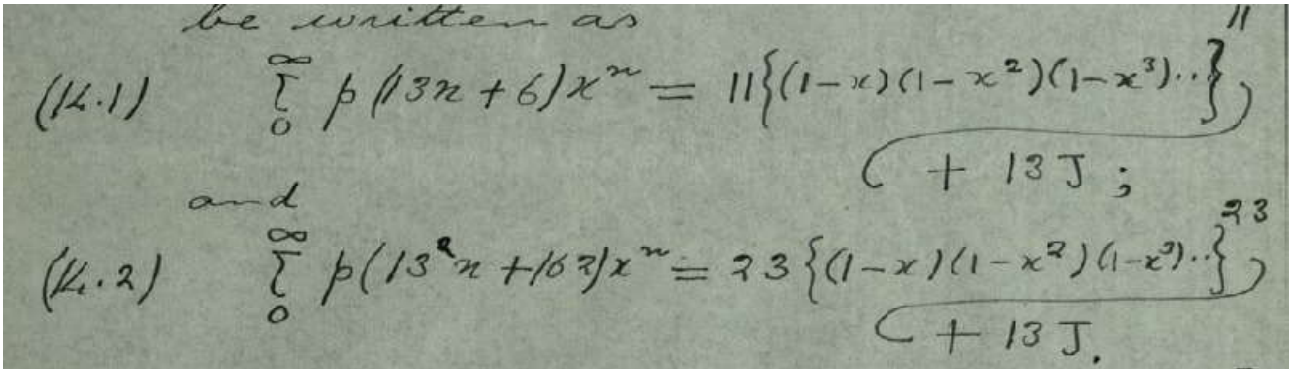
$1.6437518\ldots\ldots \approx \zeta(2) = \frac{\pi^2}{6} = 1.644934\ldots$

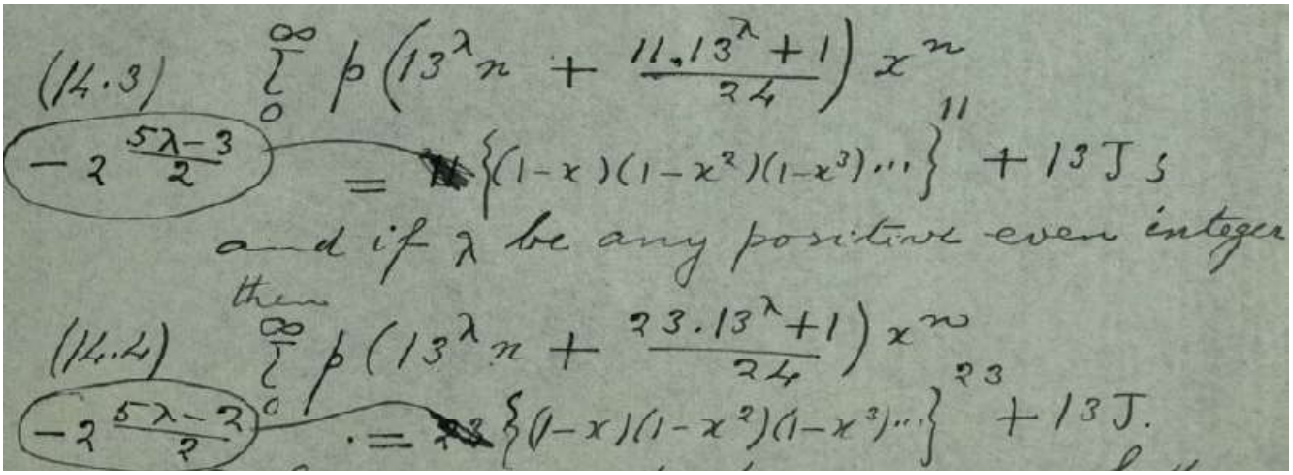
Ramanujan's mathematics

Now, we have that:

From:

https://trin-digital-library.trin.cam.ac.uk/iiif/2/Add.Ms.a.94.13%2F022_Add.Ms.a.94.13_021.jpg/full/1000,1600/0/default.jpg



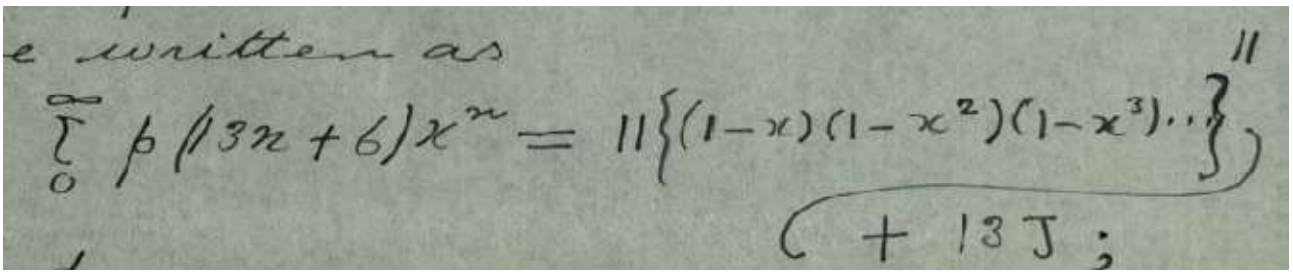


We remember that:

11J = (-312.388 * 9.83114i – 1) = 3071.13

x = 2; J = 279.1936 and λ = 8

from



we obtain:

11((1-2)(1-2^2)(1-2^3))^11+13*279.1936

Input interpretation:

$$11\left((1-2)\left(1-2^2\right)\left(1-2^3\right)\right)^{11}+13\times 279.1936$$

Result:

$-3.8530525059608014832 \times 10^{15}$

-3.8530525…*10^{15}

(13n+6)2^n = -3.85305250596080148 32×10^15

-((13x+6)2^x) = -3.85305250596080148 32×10^15

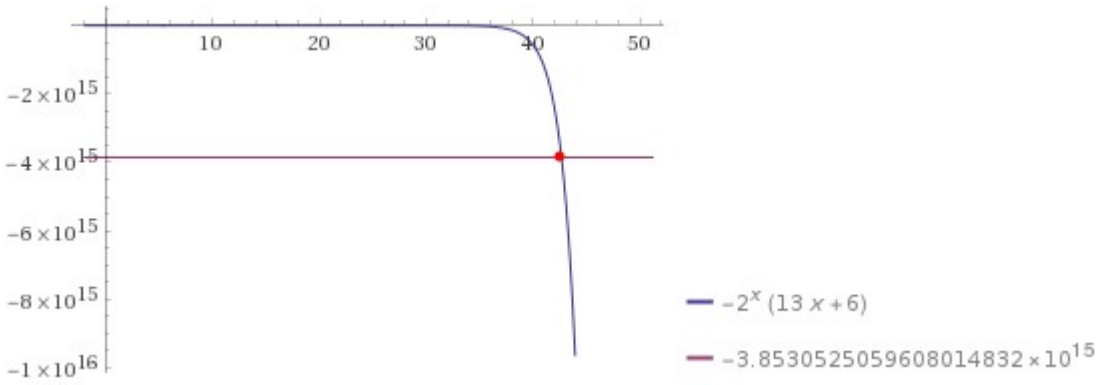
Input interpretation:

$$-\left((13\,x+6)\times 2^{x}\right) = -3.85305250596080148 32\times 10^{15}$$

Result:

$$-2^{x}\,(13\,x+6) = -3.85305250596080148 32\times 10^{15}$$

Plot:



Alternate form:

$$2^{x}\,(1.0000000000000000000\,x + 0.46153846153846153 85) = 2.963886543046770372\times 10^{14}$$

Alternate form assuming x is positive:

$$2^{x}\,(13\,x+6) = 3.85305250596080148 32\times 10^{15}$$

Expanded form:

$$-13\times 2^{x}\,x - 3\times 2^{x+1} = -3.85305250596080148 32\times 10^{15}$$

Real solution:

$$x \approx 42.644660115550230256$$

42.64466…

Solution:

$x \approx 0.11097654160684333903\,(13.000000000000000000\,W_n(2.82894\times10^{14}) - , 4.1588830833596718565)$

$n \in \mathbb{Z}$

$W_k(z)$ is the analytic continuation of the product log function

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

Indeed:

-((13*42.64466+6)2^42.64466)

Input interpretation:

$-\left((13\times42.64466+6)\times2^{42.64466}\right)$

Result:

$-3.85305...\times10^{15}$

-3.85305…*10^{15}

p(13n+6) x^n for x = 2 is equal to -3.85305218702859094149284… × 10^15

We note that:

(-1/(26015-1255-176-30))(-((13*42.64466+6)2^42.64466))

Where p(9) = 30; p(15) = 176; p(23) = 1255; p(38) = 26015

Input:

$-\left(\left(-\left((13\times42.64466000000000000000000000000000000000000000000+6)\times 2^{42.64466000000000000000000000000000000000000000000}\right)\right)/(26\,015-1255-176-30)\right)$

Result:

$1.569215682588820942206096119293426650632887371195...\times10^{11}$

1.56921568…*10^{11}

For p(164) = 156919475295 = $1.56919475295 \times 10^{11}$

The difference between the two results:

156921568258 – 156919475295 = 2092963, that is a prime number.

We have also:

((((13*42.64466+6)2^42.64466)))^1/75

Input interpretation:

$\sqrt[75]{(13 \times 42.64466 + 6) \times 2^{42.64466}}$

Result:

1.613655163055993615990130126584323940887162165049631240758...

1.613655163…. result that is a good approximation to the value of the golden ratio 1.618033988749...

And:

((((13*42.64466+6)2^42.64466)))^1/5 + 5

Input interpretation:

$\sqrt[5]{(13 \times 42.64466 + 6) \times 2^{42.64466}} + 5$

Result:

1314.67...

1314.67…. result practically equal to the rest mass of Xi baryon 1314.86

((((13*42.64466+6)2^42.64466)))^1/7 – 34

Input interpretation:

$\sqrt[7]{(13 \times 42.64466 + 6) \times 2^{42.64466}} - 34$

Result:

134.478...

134.478… result practically equal to the rest mass of Pion meson 134.9766 MeV

27*1/2(((((13*42.64466+6)2^42.64466)))^1/7 - 29 - 11)-5-1/2

Input interpretation:

$$27\times\frac{1}{2}\left(\sqrt[7]{(13\times42.64466+6)\times2^{42.64466}}-29-11\right)-5-\frac{1}{2}$$

Result:

1728.95...

1728.95… ≈ 1729

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

((((27*1/2(((((13*42.64466+6)2^42.64466)))^1/7 - 29 - 11)-5-1/2))))^1/15

Input interpretation:

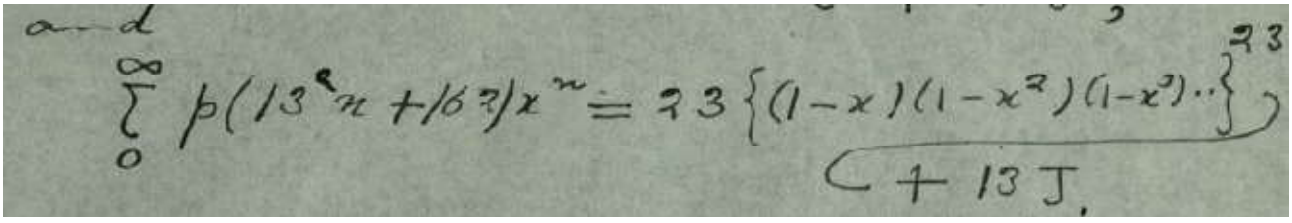
$$\sqrt[15]{27\times\frac{1}{2}\left(\sqrt[7]{(13\times42.64466+6)\times2^{42.64466}}-29-11\right)-5-\frac{1}{2}}$$

Result:

1.643812...

1.643812…. ≈ $\zeta(2)=\frac{\pi^2}{6}=1.644934\ldots$

Now, we have that:



For x = 2 and J = 279.1936:

23((1-2)(1-2^2)(1-2^3))^23+13*279.1936

Input interpretation:

$$23\left((1-2)\left(1-2^2\right)\left(1-2^3\right)\right)^{23}+13\times 279.1936$$

Result:

$$-5.926136012748902071436874499857348 32\times 10^{31}$$

$-5.926136\ldots*10^{31}$

From the two expressions, we obtain also:

(27/10)*sqrt(((1/[((((23((1-2)(1-2^2)(1-2^3))^23+13*279.1936)))) / ((((11((1-2)(1-2^2)(1-2^3))^11+13*279.1936))))]))

Input interpretation:

$$\frac{27}{10}\sqrt{\frac{1}{\frac{23\left((1-2)\left(1-2^2\right)\left(1-2^3\right)\right)^{23}+13\times 279.1936}{11\left((1-2)\left(1-2^2\right)\left(1-2^3\right)\right)^{11}+13\times 279.1936}}}$$

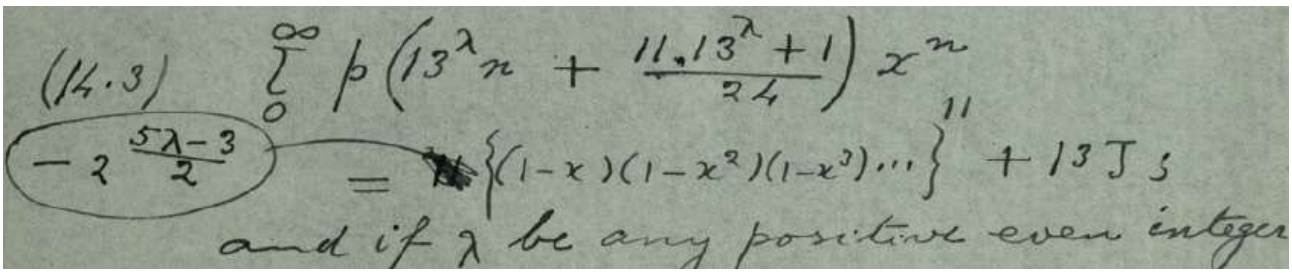
Result:

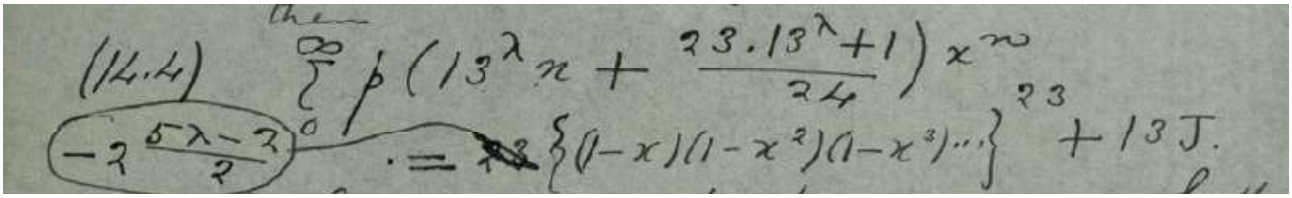
$$2.177110239113014144\ldots\times 10^{-8}$$

$2.177110239\ldots*10^{-8}$ result practically equal to the Planck mass

$2.176435(24)\times 10^{-8}$ kg

Now, we have:





For $\lambda = 8$, $x = 2$ and $J = 279.1936$ we obtain:

-2^(37/2)*((1-2)(1-2^2)(1-2^3))^11+13*279.1936

Input interpretation:

$$-2^{37/2}\,((1-2)(1-2^2)(1-2^3))^{11} + 13 \times 279.1936$$

Result:

$1.29857537143199001950459... \times 10^{20}$

$1.298575\ldots*10^{20}$

-2^(38/2)*((1-2)(1-2^2)(1-2^3))^23+13*279.1936

Input interpretation:

$$-2^{38/2}\,((1-2)(1-2^2)(1-2^3))^{23} + 13 \times 279.1936$$

Result:

$1.350870433848737551838911329552829997 5168 \times 10^{36}$

$1.350870433\ldots*10^{36}$

From the two expressions, we obtain also:

19*sqrt[(((-2^(38/2)*((1-2)(1-2^2)(1-2^3))^23+13*279.1936)))/(((-2^(37/2)*((1-2)(1-2^2)(1-2^3))^11+13*279.1936)))]

where 19 is a twin prime ((pairs (17, 19)))

Input interpretation:

$$19\sqrt{\frac{-2^{38/2}\,((1-2)(1-2^2)(1-2^3))^{23} + 13 \times 279.1936}{-2^{37/2}\,((1-2)(1-2^2)(1-2^3))^{11} + 13 \times 279.1936}}$$

Result:

$1.93787994506830148932764... \times 10^{9}$

$1.937879945\ldots*10^{9}$ result very near to the value of the Planck energy 1.9561×10^{9} J

Now, we have that:

Add MS a 94 13(22) 22 (22)

A number of results such as the following can be deduced from (14.3) and (14.4). If λ be any positive odd integer then

$$(14.5)\quad \left\{\begin{array}{l} p\left(\frac{11.13^\lambda+1}{24}\right)+2^{\frac{5\lambda-3}{2}}, \\ p\left(\frac{35.13^\lambda+1}{24}\right)+2^{\frac{5\lambda-1}{2}}, \\ p\left(\frac{59.13^\lambda+1}{24}\right)-2^{\frac{5\lambda+3}{2}}, \\ p\left(\frac{83.13^\lambda+1}{24}\right)-2^{\frac{5}{2}(\lambda+1)}, \\ p\left(\frac{107.13^\lambda+1}{24}\right)-2^{\frac{5\lambda+7}{2}}, \\ p\left(\frac{131.13^\lambda+1}{24}\right)-2^{\frac{5}{2}(\lambda+1)}, \\ p\left(\frac{155.13^\lambda+1}{24}\right), \end{array}\right.$$

are all divisible by 13; and so on

and if λ be any positive even integer

$$(14.6)\quad \left\{\begin{array}{l} p\left(\frac{23.13^\lambda+1}{24}\right)+2^{\frac{5\lambda-2}{2}}, \\ p\left(\frac{47.13^\lambda+1}{24}\right)+2^{\frac{5\lambda+6}{2}}, \\ p\left(\frac{71.13^\lambda+1}{24}\right)-2^{\frac{5\lambda+2}{2}}, \\ p\left(\frac{95.13^\lambda+1}{24}\right)-2^{\frac{5\lambda+2}{2}}, \\ p\left(\frac{119.13^\lambda+1}{24}\right)-2^{\frac{5\lambda-2}{2}}, \\ p\left(\frac{143.13^\lambda+1}{24}\right)+2^{\frac{5\lambda+2}{2}}, \\ p\left(\frac{167.13^\lambda+1}{24}\right), \end{array}\right.$$

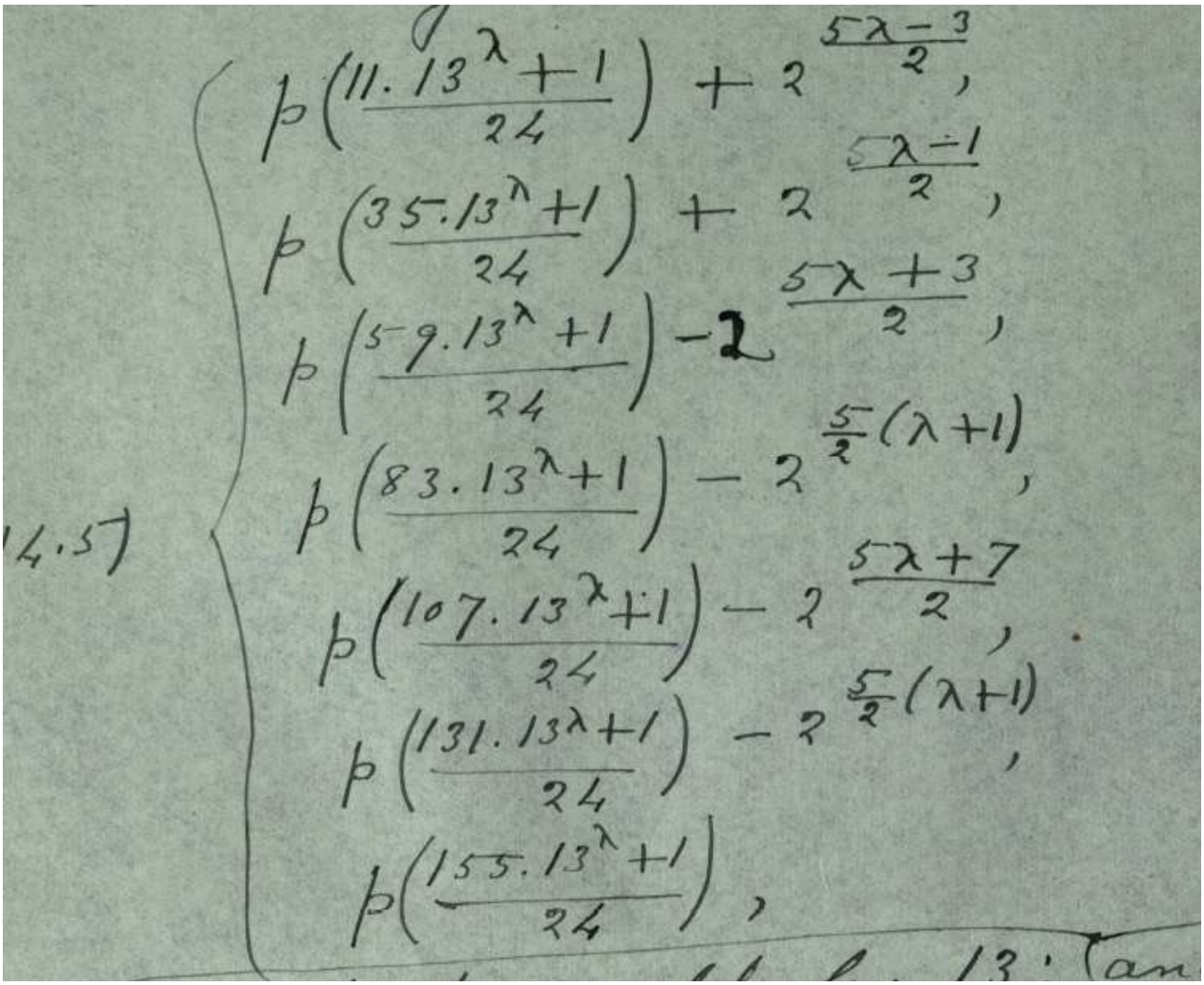
for modulus 13 can be completely ascertained

and so on are all divisible by 13.

In other words if n is fixed and $\lambda+n$ is an even integer then the residue of

$$(14.7)\quad p\left\{\frac{13^\lambda(12n-1)+1}{24}\right\}$$

From:



For λ = 3, we obtain:

p((11*13^3+1)/24) + 2^((5*3-3)/2)

((11*13^3+1)/24)

Input:

$$\frac{1}{24}\left(11\times 13^3+1\right)$$

Result:

1007

1007

p(1007) = 3172466849372887288100649157822 6

3172466849372887288100649157822 6 + 2^((5*3-3)/2)

Input:

$$31\,724\,668\,493\,728\,872\,881\,006\,491\,578\,226 + 2^{1/2\,(5\times 3-3)}$$

Result:

31 724 668 493 728 872 881 006 491 578 290

Scientific notation:

$3.172466849372887288100649157829 \times 10^{31}$

3.172466849372…*10^31

p((35*13^3+1)/24) + 2^((5*3-1)/2)

Input:

$$\frac{1}{24}\,(35\times 13^3+1)$$

Result:

3204

3204

p(3204) = 509916755043046677119363776450904149616258340615171112513 90

509916755043046677119363776450904149616258340615171112513 90 + 2^((5*3-1)/2)

Input:

$$50\,991\,675\,504\,304\,667\,711\,936\,377\,645\,090\,414\,961\,625\,834\,061\,517\,111\,251\,390 + 2^{1/2\,(5\times 3-1)}$$

Result:

50 991 675 504 304 667 711 936 377 645 090 414 961 625 834 061 517 111 251 518

Decimal approximation:

$5.0991675504304667711936377645090414961625834061517111... \times 10^{58}$

$5.09916755043…*10^{58}$

p((59*13^3+1)/24) - 2^((5*3+3)/2)

Input:

$\frac{1}{24}(59 \times 13^3 + 1)$

Result:

5401

5401

p(5401) = 196989724107098149934656748920512816558680802485326475795721652283054261982909

196989724107098149934656748920512816558680802485326475795721652283054261982909 - 2^((5*3+3)/2)

Input:

$196\,989\,724\,107\,098\,149\,934\,656\,748\,920\,512\,816\,558\,680\,802\,485\,326\,475\,795\,721\,652\,283\,054\,261\,982\,909 - 2^{1/2\,(5 \times 3+3)}$

Result:

196 989 724 107 098 149 934 656 748 920 512 816 558 680 802 485 326 475 795 721 652 283 054 261 982 397

Decimal approximation:

$1.969897241070981499346567489205128165586808024853264...\times 10^{77}$

$1.969897241…*10^{77}$

From these three results

1.969897241070981499346567489205128165586808024853264 7 × 10^77

5.099167550430466771193637764509041496162583406151711125151 8 * 10^58

3.172466849372887288100649157829 × 10^31

we obtain:

1/2 *1/1232
*1/938(1.969897241070981499346567489205128165586808024853264 7 × 10^77 /
5.099167550430466771193637764509041496162583406151711125151 8 * 10^58 /
3.172466849372887288100649157829 × 10^31)

where 1232 and 938 are the Delta baryon and Proton masses

Input interpretation:

$$\frac{1}{2}\times\frac{1}{1232}\times\frac{1}{938}\left(\frac{1.969897241070981499346567489205128165586808024853264 7\times10^{77}}{5.099167550430466771193637764509041496162583406151711125151 8}\times\frac{10^{58}}{3.172466849372887288100649157829\times10^{31}}\right)$$

Result:

$5.268702238143576037532023242945738288153403757034237 5\ldots\times10^{96}$

5.268702238…*10^{96} result very near to the value of Planck density

5.1550×10^{96} kg/m^3

p((83*13^3+1)/24) - 2^((5/2(3+1)))

Input:

$$\frac{1}{24}\left(83\times13^3+1\right)$$

Result:

7598

7598

p(7598) =
240276187240970911452043076965175920110900755858619947499615116277538369215868965179066802688

240276187240970911452043076965175920110900755858619947499615116277538369215868965179066802688 -2^((5/2(3+1)))

Input:

$$240\,276\,187\,240\,970\,911\,452\,043\,076\,965\,175\,920\,110\,900\,755\,858\,619\,947\,499\,615 \cdot 116\,277\,538\,369\,215\,868\,965\,179\,066\,802\,688 - 2^{5/2\,(3+1)}$$

Exact result:

$$240\,276\,187\,240\,970\,911\,452\,043\,076\,965\,175\,920\,110\,900\,755\,858\,619\,947\,499\,615 \cdot 116\,277\,538\,369\,215\,868\,965\,179\,066\,801\,664$$

Decimal approximation:

$2.402761872409709114520430769651759201109007558586199\ldots \times 10^{92}$

$2.402761872409\ldots*10^{92}$

p((107*13^3+1)/24) - 2^((5*3+7)/2)

Input:

$$p\left(\frac{1}{24}\left(107\times 13^3+1\right)\right)-2^{1/2\,(5\times 3+7)}$$

Result:

$p(9795)-2048$

Input:

$$\frac{1}{24}\left(107\times 13^3+1\right)$$

Result:

9795

9795

p(9795) =
2627358629091710268792769804252322121836389307744537124117337893825799000762365987435420896314854279079811

2627358629091710268792769804252322121836389307744537124117337893825799000762365987435420896314854279079811 - 2^((5*3+7)/2)

Input:

$$2\,627\,358\,629\,091\,710\,268\,792\,769\,804\,252\,322\,121\,836\,389\,307\,744\,537\,124\,117\,337 \cdot 893\,825\,799\,000\,762\,365\,987\,435\,420\,896\,314\,854\,279\,079\,811 - 2^{1/2\,(5\times 3+7)}$$

Result:

$$2\,627\,358\,629\,091\,710\,268\,792\,769\,804\,252\,322\,121\,836\,389\,307\,744\,537\,124\,117\,337 \cdot 893\,825\,799\,000\,762\,365\,987\,435\,420\,896\,314\,854\,279\,077\,763$$

Decimal approximation:

$$2.627358629091710268792769804252322121836389307744537 1\ldots \times 10^{105}$$

$2.62735862909\ldots*10^{105}$

p((131*13^3+1)/24) - 2^((5/2(3+1)))

1179165663048052432172494238326644885870984485671225451651649236679026397285988979830645799546634204707917874075153030 - 2^((5/2(3+1)))

Input:

$$1\,179\,165\,663\,048\,052\,432\,172\,494\,238\,326\,644\,885\,870\,984\,485\,671\,225\,451\,651\,649 \cdot 236\,679\,026\,397\,285\,988\,979\,830\,645\,799\,546\,634\,204\,707\,917\,874\,075\,153\,030 - 2^{5/2\,(3+1)}$$

Exact result:

$$1\,179\,165\,663\,048\,052\,432\,172\,494\,238\,326\,644\,885\,870\,984\,485\,671\,225\,451\,651\,649 \cdot 236\,679\,026\,397\,285\,988\,979\,830\,645\,799\,546\,634\,204\,707\,917\,874\,075\,152\,006$$

Decimal approximation:

$$1.17916566304805243217249423832664488587098448567122 54\ldots \times 10^{117}$$

$1.179165663048\ldots.*10^{117}$

p((155*13^3+1)/24)

Input:

$$p\left(\frac{1}{24}\left(155\times 13^3+1\right)\right)$$

Result:

$p(14\,189)$

p(14189) =
505629248789219673656942626024489371739708938179623937876399143841026553411423699417271566486470175093920313341116375694001380 10

Input:

$$50\,562\,924\,878\,921\,967\,365\,694\,262\,602\,448\,937\,173\,970\,893\,817\,962\,393\,787\,639\,\ldots$$
$$914\,384\,102\,655\,341\,142\,369\,941\,727\,156\,648\,647\,017\,509\,392\,031\,334\,111\,637\,569\,\ldots$$
$$400\,138\,010$$

Decimal approximation:

$5.056292487892196736569426260244893717397089381796239... \times 10^{127}$

$5.056292487892\ldots*10^{127}$

From the results

$2.402761872409\ldots*10^{92}$
$2.62735862909\ldots*10^{105}$
$1.179165663048\ldots.*10^{117}$
$5.056292487892\ldots*10^{127}$

we obtain:

(2.62735862909*10^105 / 2.402761872409*10^92) * 1/(5.056292487892*10^127 / 1.179165663048*10^117)

Input interpretation:

$$\frac{2.62735862909\times 10^{105}}{2.402761872409\times 10^{92}}\times\frac{1}{\frac{5.056292487892\times 10^{127}}{1.179165663048\times 10^{117}}}$$

Result:

255.00650621937043953183221854316319596437324582029562131 41...

255.00650621937…

From the three previous results

1.969897241070981499346567489205128165586808024853264 7 × 10^77

5.099167550430466771193637764509041496162583406151711125151 8 * 10^58

3.172466849372887288100649157829 × 10^31

we obtain:

3.172466849372887288100649157829 × 10^31 / ((((1.969897241070981499346 5 × 10^77) / (5.099167550430466771193637 7 * 10^58))))

Input interpretation:

$$\frac{3.172466849372887288100649157829 \times 10^{31}}{\frac{1.969897241070981499346 5 \times 10^{77}}{5.099167550430466771193637 7 \times 10^{58}}}$$

Result:

8.212073033994213819990247962828885294804905305080036 2... × 10^{12}

8.212073033994…*10^{12}

From all results

2.62735862909*10^105 2.402761872409*10^92 5.056292487892*10^127

1.179165663048*10^117

1.969897241070981499346567489205128165586808024853264 7 × 10^77

5.099167550430466771193637764509041496162583406151711125151 8 * 10^58

3.172466849372887288100649157829 × 10^31

we obtain:

8.21207303399421381999 × 10^12 1 / (((((2.62735862909*10^105 / 2.402761872409*10^92) 1/ (5.056292487892*10^127 / 1.179165663048*10^117)))))

Input interpretation:

$$8.21207303399421381999 \times 10^{12} \times \frac{1}{\frac{2.62735862909 \times 10^{105}}{2.402761872409 \times 10^{92}} \times \frac{1}{\frac{5.056292487892 \times 10^{127}}{1.179165663048 \times 10^{117}}}}$$

Result:

$3.22033863203856563897769946194949594360691733383601 71\ldots \times 10^{10}$

$3.220338632\ldots *10^{10}$

Performing the ln and after some calculations, we obtain:

24*3*ln(((((8.21207303399421381999 × 10^12 * 1 / (((((2.62735862909*10^105 / 2.402761872409*10^92) 1/ (5.056292487892*10^127 / 1.179165663048*10^117)))))))))-13

Input interpretation:

$$24 \times 3 \log\left(8.21207303399421381999 \times 10^{12} \times \frac{1}{\frac{2.62735862909 \times 10^{105}}{2.402761872409 \times 10^{92}} \times \frac{1}{\frac{5.056292487892 \times 10^{127}}{1.179165663048 \times 10^{117}}}}\right) - 13$$

$\log(x)$ is the natural logarithm

Result:

1729.064296342...

1729.064296342…

This result is very near to the mass of candidate glueball **f_0(1710) scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic

curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

And:

(((((24*3*ln(((((8.21207303399421381999 × 10^12 * 1 / (((((2.62735862909*10^105 / 2.402761872409*10^92) 1/ (5.056292487892*10^127 / 1.179165663048*10^117))))))))))-13)))))^1/15

Input interpretation:

$$\left(24 \times 3 \log\left(8.21207303399421381999 \times 10^{12} \times \frac{1}{\frac{2.62735862909 \times 10^{105}}{2.402761872409 \times 10^{92}} \times \frac{1}{\frac{5.056292487892 \times 10^{127}}{1.179165663048 \times 10^{117}}}}\right) - 13\right)\text{^}(1/15)$$

$\log(x)$ is the natural logarithm

Result:

1.6438193039164...

1.6438193039164.... $\approx \zeta(2) = \frac{\pi^2}{6} = 1.644934$ ...

From the sum of all the results, we obtain:

(2.62735862909*10^105 + 2.402761872409*10^92 + 5.056292487892*10^127 + 1.179165663048*10^117 +1.9698972410709814993 × 10^77 + 5.0991675504304667711936 * 10^58 +3.17246684937288728810064915782 9 × 10^31)

(5.056292487892×10^127 + 1.179165663048*10^117 +1.9698972410709814993 × 10^77 + 5.099167550

Input interpretation:

$$5.056292487892\times10^{127}+1.179165663048\times10^{117}+1.9698972410709814993\times10^{77}+5.0991675504304667711936\times10^{58}+3.1724668493728872881006491578 29\times10^{31}$$

Result:

$5.056292488010\times10^{127}$

$5.056292488010*10^{127}$

Scientific notation:

$5.0562924880099165663048000000000000000000000000000196...\times10^{127}$

From which:

9/(8Pi)*1/(((((((5.056292487892×10^127 + 1.179165663048*10^117 +1.9698972410709814993 × 10^77 + 5.099167550430466771 1936 * 10^58 +3.1724668493728872881006491578 29 × 10^31))))^1/(1+e))))

Input interpretation:

$$\frac{9}{8\pi}\times1\Big/\left((5.056292487892\times10^{127}+1.179165663048\times10^{117}+1.9698972410709814993\times10^{77}+5.0991675504304667711936\times10^{58}+3.1724668493728872881006491578 29\times10^{31})\,\hat{}\,\left(\frac{1}{1+e}\right)\right)$$

Result:

$1.618648341563...\times10^{-35}$

$1.618648341563…*10^{-35}$ result near to the Planck length $1.616255*10^{-35}$ m

Now, we have that:

p(13^3(12*2-1)+1)/24

Input:

$$\frac{1}{24}\left(13^3\,(12\times 2-1)+1\right)$$

Exact result:

$$\frac{4211}{2}$$

Decimal form:

2105.5

2105.5

p(2105) = 876901139551878455267926663668514017128011342 74

p(2106) = 901331008658061179182034807536138590383815963 24

1/2(876901139551878455267926663668514017128011342 74 + 901331008658061179182034807536138590383815963 24)

Input:

$$\frac{1}{2}\,(87\,690\,113\,955\,187\,845\,526\,792\,666\,366\,851\,401\,712\,801\,134\,274 + 90\,133\,100\,865\,806\,117\,918\,203\,480\,753\,613\,859\,038\,381\,596\,324)$$

Exact result:

88 911 607 410 496 981 722 498 073 560 232 630 375 591 365 299

Scientific notation:

$8.891160741049698172249807356023263037559136529 9 \times 10^{46}$

$8.891160741\ldots*10^{46}$

From which:

1/728(8.891160741049698172249807356023263037559136529 9 × 10^46)

where $728 = 9^3 - 1$ = Ramanujan Taxicab Number

Input interpretation:

$$\frac{1}{728} \times 8.8911607410496981722498073560232630375591365299 \times 10^{46}$$

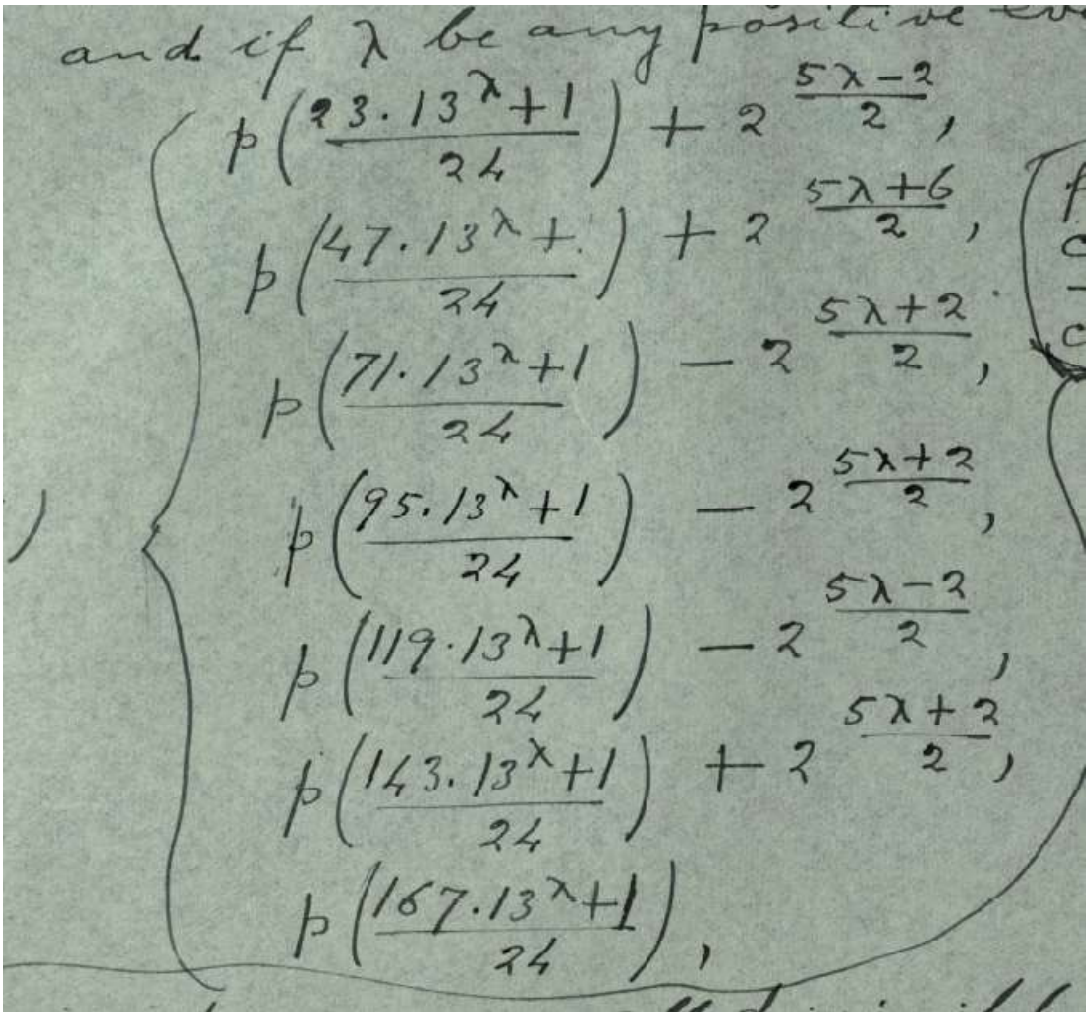
Result:

$1.2213132886057277709134350763768218458185627101510989... \times 10^{44}$

$1.2213132886\ldots*10^{44}$ result very near to the value of the Planck force 1.2103×10^{44} N

Now, we have that:

https://mss-cat.trin.cam.ac.uk/manuscripts/uv/view.php?n=Add.Ms.a.94.13#?c=0&m=0&s=0&cv=22&xywh=-1323%2C2931%2C5798%2C3615



For $\lambda = 2$, we obtain:

p((23*13^2+1)/24) + 2^((5*2-2)/2)

p(162)= 129913904637

129913904637 + 2^((5*2-2)/2)

Input:

$129\,913\,904\,637 + 2^{1/2\,(5\times 2-2)}$

Result:

129 913 904 653

Scientific notation:

$1.29913904653 \times 10^{11}$

$1.29913904653*10^{11}$

p((47*13^2+1)/24) + 2^((5*2+6)/2)

p(331)= 78801255302666615

78801255302666615 + 2^((5*2+6)/2)

Input:

$78\,801\,255\,302\,666\,615 + 2^{1/2\,(5\times 2+6)}$

Result:

78 801 255 302 666 871

Scientific notation:

$7.8801255302666871 \times 10^{16}$

$7.88012553026*10^{16}$

p((71*13^2+1)/24) - 2^((5*2+2)/2)

p(500)= 2300165032574323995027

2300165032574323995027- 2^((5*2+2)/2)

Input:

$2\,300\,165\,032\,574\,323\,995\,027 - 2^{1/2\,(5\times 2+2)}$

Result:

2 300 165 032 574 323 994 963

Scientific notation:

$2.3001650325743239949 63 \times 10^{21}$

$2.30016503257*10^{21}$

((95*13^2+1)/24) - 2^((5*2+2)/2)

p(669) = 1381524180278344894320616 0

1381524180278344894320616 0 - 2^((5*2+2)/2)

Input:

$13\,815\,241\,802\,783\,448\,943\,206\,160 - 2^{1/2\,(5\times 2+2)}$

Result:

13 815 241 802 783 448 943 206 096

Scientific notation:

$1.3815241802783448943206096 \times 10^{25}$

$1.38152418027*10^{25}$

((119*13^2+1)/24) - 2^((5*2-2)/2)

p(838)= 3006382611731098237208647 6080

3006382611731098237208647 6080- 2^((5*2-2)/2)

Input:

$30\,063\,826\,117\,310\,982\,372\,086\,476\,080 - 2^{1/2\,(5\times 2-2)}$

Result:

30 063 826 117 310 982 372 086 476 064

Scientific notation:

$3.006382611731098237208647606 4 \times 10^{28}$

$3.00638261173*10^{28}$

((143*13^2+1)/24) + 2^((5*2+2)/2)

p(1007)= 3172466849372887288100649157822 6

3172466849372887288100649157822 6+2^((5*2+2)/2)

Input:

$31\,724\,668\,493\,728\,872\,881\,006\,491\,578\,226 + 2^{1/2\,(5\times 2+2)}$

Result:

31 724 668 493 728 872 881 006 491 578 290

Scientific notation:

$3.172466849372887288100649157829 \times 10^{31}$

$3.17246684937*10^{31}$

((167*13^2+1)/24)

Input:

$\frac{1}{24}\left(167\times 13^2+1\right)$

Result:

1176

1176

p(1176)= 193144816633458196493851581626793 00

Input:

19 314 481 663 345 819 649 385 158 162 679 300

Scientific notation:

$1.9314481663345819649385158162679300 \times 10^{34}$

$1.93144816633*10^{34}$

From the seven results

$1.29913904653*10^{11}$
$7.88012553026*10^{16}$
$2.30016503257*10^{21}$
$1.38152418027*10^{25}$
$3.00638261173*10^{28}$
$3.17246684937*10^{31}$
$1.93144816633*10^{34}$

we obtain:

(7.88012553026*10^16 / 2.30016503257*10^21 * 1.29913904653*10^11) *1/ (1.93144816633*10^34 / 3.17246684937*10^31)+(3.00638261173*10^28 / 1.38152418027*10^25)

Input interpretation:

$$\left(\frac{7.88012553026 \times 10^{16}}{2.30016503257 \times 10^{21}} \times 1.29913904653 \times 10^{11}\right) \times \frac{1}{\frac{1.93144816633 \times 10^{34}}{3.17246684937 \times 10^{31}}} + \frac{3.00638261173 \times 10^{28}}{1.38152418027 \times 10^{25}}$$

Result:

9486.579560859178450358631406860644827409328174752206799211...

9486.57956….

From which:

(7.88012553026*10^16 / 2.30016503257*10^21 * 1.29913904653*10^11) *1/ (1.93144816633*10^34 / 3.17246684937*10^31)+(3.00638261173*10^28 / 1.38152418027*10^25) - 26

where 26 is the dimensions number of Bosonic String Theory

Input interpretation:

$$\left(\frac{7.88012553026\times10^{16}}{2.30016503257\times10^{21}}\times1.29913904653\times10^{11}\right)\times\frac{1}{\frac{1.93144816633\times10^{34}}{3.17246684937\times10^{31}}}+\frac{3.00638261173\times10^{28}}{1.38152418027\times10^{25}}-26$$

Result:

9460.579560859178450358631406860644827409328174752206799211...

9460.579560859… result practically equal to the rest mass of Upsilon meson 9460.30

1/(2e)* [(7.88012553026*10^16 / 2.30016503257*10^21 * 1.29913904653*10^11) *1/ (1.93144816633*10^34 / 3.17246684937*10^31)+(3.00638261173*10^28 / 1.38152418027*10^25)]-16

Input interpretation:

$$\frac{1}{2e}\left(\left(\frac{7.88012553026\times10^{16}}{2.30016503257\times10^{21}}\times1.29913904653\times10^{11}\right)\times\frac{1}{\frac{1.93144816633\times10^{34}}{3.17246684937\times10^{31}}}+\frac{3.00638261173\times10^{28}}{1.38152418027\times10^{25}}\right)-16$$

Result:

1728.9587937...

1728.9587937…

This result is very near to the mass of candidate glueball **$f_0(1710)$ scalar meson.** Furthermore, 1728 occurs in the algebraic formula for the j-invariant of an elliptic curve. The number 1728 is one less than the Hardy–Ramanujan number 1729 (taxicab number)

(((1/(2e)* [(7.88012553026*10^16 / 2.30016503257*10^21 * 1.29913904653*10^11) *1/ (1.93144816633*10^34 / 3.17246684937*10^31)+(3.00638261173*10^28 / 1.38152418027*10^25)]-16)))^1/15

Input interpretation:

$$\left(\frac{1}{2e}\left(\left(\frac{7.88012553026\times10^{16}}{2.30016503257\times10^{21}}\times1.29913904653\times10^{11}\right)\times\frac{1}{\frac{1.93144816633\times10^{34}}{3.17246684937\times10^{31}}}+\frac{3.00638261173\times10^{28}}{1.38152418027\times10^{25}}\right)-16\right)\text{^}(1/15)$$

Result:

1.64381261698...

1.64381261698…. $\approx \zeta(2) = \frac{\pi^2}{6} = 1.644934$ ...

Observations

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

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

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

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

From Wikipedia

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

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

Note that:

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

Hence

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

so that

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

Hence

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

Thence:

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

And

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

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

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

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

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

The beginning of the sequence is thus:

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

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

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

The sequence of Lucas numbers is:

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

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

A Lucas prime is a Lucas number that is prime. The first few Lucas primes are:

2, 3, 7, 11, 29, 47, 199, 521, 2207, 3571, 9349, 3010349, 54018521, 370248451, 6643838879, ... (sequence A005479 in the OEIS).

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

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

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

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

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