On the possible relationships between several Ramanujan formulas, some equations concerning the Lepton and Quark Masses and some sectors of Number Theory.

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Abstract

In this paper, we describe and analyze the possible relationships between several Ramanujan formulas, some equations concerning the Lepton and Quark Masses and some sectors of Number Theory.

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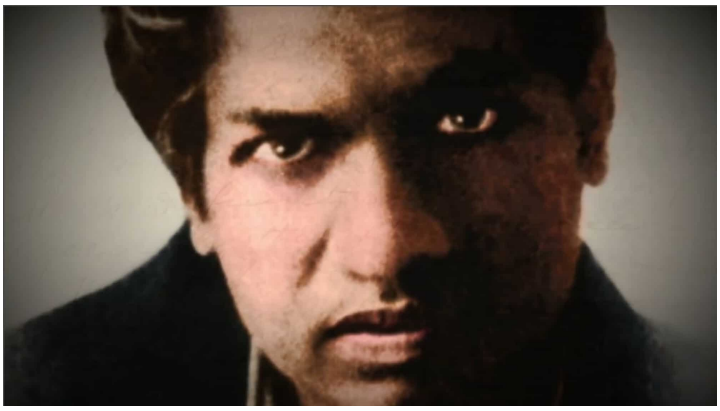

https://universe-inside-you.com/ramanujan-akashic-records/

From

Models of Lepton and Quark Masses - *Steven Weinberg* ***** Theory Group, Department of Physics, University of Texas **-** Austin, TX, 78712 - arXiv:2001.06582v1 [hep-th] 18 Jan 2020

With regard the Higgs boson, this is a spin-zero particle, it is the first observe ostensibly elementary particle to be described by the Klein–Gordon equation.

M = 125.18 ± 0.16 GeV/c

elements when diagonalized. If we assume that $b > 0$ and $-b < c < 0$, then at the global minimum of the potential, the ϕ_{ia} when diagonalized would have two zero diagonal elements and one non-zero diagonal element λ, with $\lambda^2 = \mu^2/(2c + 2b)$, which we can define as the 33-element. In this case naturally only the third generation of quarks and leptons would have masses in the tree approximation, given by

$$m_\tau = G_{\mathcal{L}}\lambda\,, \quad m_b = G_D\lambda\,, \quad m_t = G_U\lambda\,. \tag{7}$$

Just as in the Standard Model, the breaking of the electroweak symmetry gives masses to the W and Z and eliminates the Goldstone bosons associated with Φ^+_{33} and $\mathrm{Im}\,\Phi^0_{33}$, leaving a neutral scalar associated with $\mathrm{Re}\,\Phi^0_{33}$ whose couplings to the third generation quarks and leptons are the same as for the Higgs boson of the Standard Model.

This introduction of new scalar doublets can be tolerated only if the masses of the new scalar particles introduced in this way can all be much larger than the Standard Model Higgs mass, $m_H = 125$ GeV. For the potential (5), the known value of m_H fixes μ to have the value $m_H/2$, and the known coupling constant G_F of the weak interaction fixes the expectation value $\lambda = \mu/\sqrt{2(b+c)}$ of the scalar field $\mathrm{Re}\Phi^0_{33}$ to have the value $2^{-1/4}G_F^{-1/2} = 247$ GeV, so $b + c$ would have to take the value $b + c = \sqrt{2}G_F m_H^2/8 = 0.032$, but b and c and all the other constants in Eq. (3) would be otherwise unconstrained. The squared masses of the spinless par-

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$$m_\tau = G_{\mathcal{L}}\lambda\,, \quad m_b = G_D\lambda\,, \quad m_t = G_U\lambda\,.$$

Here and below $G_{\mathcal{L}}$, G_D and G_U are constants

The divergences in each term of Eqs. (22) and (23) are independent of N, so the total divergence in the sums is proportional to (24), and hence vanishes. Eqs. (22) and (23) then give for the mass matrices of first- and second-generation quarks of charge $+2/3$ and $-1/3$:

$$m_{ai}^{+2/3} = \frac{G_U G_D m_b}{16\pi^2} \sum_N u_{3a}^{(N+)*} u_{i3}^{(N+)} \left[\frac{M_{N+}^2 \ln M_{N+}^2 - m_b^2 \ln m_b^2}{M_{N+}^2 - m_b^2} \right] , \quad (25)$$

$$m_{ai}^{-1/3} = \frac{G_U G_D m_t}{16\pi^2} \sum_N u_{3a}^{(N+)} u_{i3}^{(N+)*} \left[\frac{M_{N+}^2 \ln M_{N+}^2 - m_t^2 \ln m_t^2}{M_{N+}^2 - m_t^2} \right] . \quad (26)$$

From the following third generation quarks masses, we obtain the constants values:

m_τ = 1776.86±0.12 MeV = 1.7769 GeV ; G_U = 0.0071923855

m_b = 4.18±0.03 GeV ; G_D = 0.0169194504

m_t = 172.76± 0.30 GeV ; $G_{\mathscr{L}}$ = 0.6992833139

λ = 247.052942 GeV

We obtain the mass matrices of first and second-generation quarks of charge +2/3 and −1/3:

((((0.0071923855*0.0169194504*4.18) / (16Pi^2) * 70.65 * [((125.18^2 ln(125.18^2) – 4.18^2 ln(4.18^2))) / (125.18^2 – 4.18^2)]))

Input interpretation:

$$\frac{0.0071923855 \times 0.0169194504 \times 4.18}{16\,\pi^2} \times 70.65 \times \frac{125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)}{125.18^2 - 4.18^2}$$

$\log(x)$ is the natural logarithm

Result:

0.00220001...

0.00220001…. GeV

convert 0.00220001 GeV (gigaelectronvolts) to megaelectronvolts

Result:

2.2 MeV (megaelectronvolts)

2.2 MeV quark up mass

Alternative representations:

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)} = \frac{0.0359375\,(-\log(a)\log_a(4.18^2)\,4.18^2+\log(a)\log_a(125.18^2)\,125.18^2)}{(-4.18^2+125.18^2)\,(16\,\pi^2)}$$

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)} = \frac{0.0359375\,(-\log_e(4.18^2)\,4.18^2+\log_e(125.18^2)\,125.18^2)}{(-4.18^2+125.18^2)\,(16\,\pi^2)}$$

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)} = \frac{0.0359375\,(\mathrm{Li}_1(1-4.18^2)\,4.18^2-\mathrm{Li}_1(1-125.18^2)\,125.18^2)}{(-4.18^2+125.18^2)\,(16\,\pi^2)}$$

Series representations:

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)} = -\frac{2.50723\times 10^{-6}\log(16.4724)}{\pi^2}+\frac{0.0022486\log(15\,669.)}{\pi^2}+\sum_{k=1}^{\infty}-\frac{0.0022486\,(-1)^k\,e^{-12.4611\,k}\left(e^{2.80169\,k}-0.00111502\,e^{9.65944\,k}\right)}{k\,\pi^2}$$

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=$$
$$-\frac{5.01447\times 10^{-6}\,i\left\lfloor\frac{\arg(17.4724-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.0044972\,i\left\lfloor\frac{\arg(15\,670.-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.00224609\log(x)}{\pi^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\left(2.50723\times 10^{-6}\,(17.4724-x)^k-0.0022486\,(15\,670.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=$$
$$-\frac{5.01447\times 10^{-6}\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{17.4724}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{0.0044972\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15\,670.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{0.00224609\log(z_0)}{\pi^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\left(2.50723\times 10^{-6}\,(17.4724-z_0)^k-0.0022486\,(15\,670.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=\int_1^{17.4724}\frac{2.5046\times 10^{-6}+0.00224609\,t}{\pi^2\,t\,(-0.998949+t)}\,dt$$

$$\frac{(70.65\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{0.0011243\,e^{-12.4611\,s}\left(e^{2.80169\,s}-0.00111502\,e^{9.65944\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds\quad\text{for } -1<\gamma<0$$

$$m_{ai}^{-1/3}=\frac{G_U G_D m_t}{16\pi^2}\sum_N u_{3a}^{(N+)}u_{i3}^{(N+)*}\left[\frac{M_{N+}^2\ln M_{N+}^2-m_t^2\ln m_t^2}{M_{N+}^2-m_t^2}\right].$$

$m_t = 172.76\pm 0.30$ GeV ; $G_U = 0.0071923855$; $G_D = 0.0169194504$

((((0.0071923855*0.0169194504*172.76) / (16Pi^2) * 3.20472* [((125.18^2 ln(125.18^2) – 172.76^2 ln(172.76^2))) / (125.18^2 – 172.76^2)]))

Input interpretation:

$$\frac{0.0071923855 \times 0.0169194504 \times 172.76}{16\,\pi^2} \times 3.20472 \times \frac{125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)}{125.18^2 - 172.76^2}$$

$\log(x)$ is the natural logarithm

Result:

0.00469999...

4.7 MeV quark down mass

Alternative representations:

$$((3.20472\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.00719239 \times 0.0169195 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \frac{0.067374\,(\log(a) \log_a(125.18^2)\,125.18^2 - \log(a) \log_a(172.76^2)\,172.76^2)}{(125.18^2 - 172.76^2)(16\,\pi^2)}$$

$$((3.20472\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.00719239 \times 0.0169195 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \frac{0.067374\,(\log_e(125.18^2)\,125.18^2 - \log_e(172.76^2)\,172.76^2)}{(125.18^2 - 172.76^2)(16\,\pi^2)}$$

$$((3.20472\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.00719239 \times 0.0169195 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \frac{0.067374\,(-\mathrm{Li}_1(1 - 125.18^2)\,125.18^2 + \mathrm{Li}_1(1 - 172.76^2)\,172.76^2)}{(125.18^2 - 172.76^2)(16\,\pi^2)}$$

Series representations:

$$((3.20472\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\,\pi^2))=$$
$$-\frac{0.00465467\log(15\,669.)}{\pi^2}+\frac{0.00886555\log(29\,845.)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}-\frac{0.00886555\,(-1)^k\,e^{-19.9632\,k}\left(e^{9.65944\,k}-0.525029\,e^{10.3038\,k}\right)}{k\,\pi^2}$$

$$((3.20472\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\,\pi^2))=$$
$$-\frac{0.00930935\,i\left\lfloor\frac{\arg(15\,670.-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.0177311\,i\left\lfloor\frac{\arg(29\,846.-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.00421088\log(x)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.00465467\,(15\,670.-x)^k-0.00886555\,(29\,846.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$((3.20472\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\,\pi^2))=$$
$$-\frac{0.00930935\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15\,670.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{0.0177311\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{29\,846.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+$$
$$\frac{0.00421088\log(z_0)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.00465467\,(15\,670.-z_0)^k-0.00886555\,(29\,846.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$((3.20472\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/$$
$$((125.18^2-172.76^2)(16\,\pi^2))=\int_1^{15\,670.}\frac{0.00221091+0.00421088\,t}{\pi^2\,t\,(-0.474987+t)}\,dt$$

$$((3.20472\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\,\pi^2))=$$
$$\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{0.00443277\,e^{-19.9632\,s}\left(e^{9.65944\,s}-0.525029\,e^{10.3038\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds$$
$$\text{for } -1<\gamma<0$$

$$m_{ai}^{+2/3} = \frac{G_U G_D m_b}{16\pi^2} \sum_N u_{3a}^{(N+)*} u_{i3}^{(N+)} \left[\frac{M_{N+}^2 \ln M_{N+}^2 - m_b^2 \ln m_b^2}{M_{N+}^2 - m_b^2} \right] ,$$

$G_U = 0.0071923855$; $m_b = 4.18 \pm 0.03$ GeV ; $G_D = 0.0169194504$

((((0.0071923855*0.0169194504*4.18) / (16Pi^2) * 41105.3 * [((125.18^2 ln(125.18^2) – 4.18^2 ln(4.18^2))) / (125.18^2 – 4.18^2)]))

Input interpretation:

$$\frac{0.0071923855 \times 0.0169194504 \times 4.18}{16\,\pi^2} \times 41\,105.3 \times \frac{125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)}{125.18^2 - 4.18^2}$$

$\log(x)$ is the natural logarithm

Result:

1.28000...

1.28 GeV quark charm mass

Alternative representations:

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.00719239 \times 0.0169195 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = \frac{20.909\,(-\log(a) \log_a(4.18^2)\,4.18^2 + \log(a) \log_a(125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.00719239 \times 0.0169195 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = \frac{20.909\,(-\log_e(4.18^2)\,4.18^2 + \log_e(125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.00719239 \times 0.0169195 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = \frac{20.909\,(\mathrm{Li}_1(1 - 4.18^2)\,4.18^2 - \mathrm{Li}_1(1 - 125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

Series representations:

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$
$$=-\frac{0.00145875\log(16.4724)}{\pi^2}+\frac{1.30827\log(15\,669.)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}-\frac{1.30827\,(-1)^k\,e^{-12.4611\,k}\left(e^{2.80169\,k}-0.00111502\,e^{9.65944\,k}\right)}{k\,\pi^2}$$

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$
$$=-\frac{0.0029175\,i\left\lfloor\frac{\arg(17.4724-x)}{2\pi}\right\rfloor}{\pi}+$$
$$\frac{2.61654\,i\left\lfloor\frac{\arg(15\,670.-x)}{2\pi}\right\rfloor}{\pi}+\frac{1.30681\log(x)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.00145875\,(17.4724-x)^k-1.30827\,(15\,670.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$
$$=-\frac{0.0029175\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{17.4724}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+$$
$$\frac{2.61654\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15\,670.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{1.30681\log(z_0)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.00145875\,(17.4724-z_0)^k-1.30827\,(15\,670.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$
$$=\int_1^{17.4724}\frac{0.00145722+1.30681\,t}{\pi^2\,t\,(-0.998949+t)}\,dt$$

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.00719239\times 0.0169195\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$

$$=\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{0.654136\,e^{-12.4611\,s}\left(e^{2.80169\,s}-0.00111502\,e^{9.65944\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

$$m_{ai}^{-1/3}=\frac{G_U G_D m_t}{16\pi^2}\sum_N u_{3a}^{(N+)}u_{i3}^{(N+)*}\left[\frac{M_{N+}^2\ln M_{N+}^2-m_t^2\ln m_t^2}{M_{N+}^2-m_t^2}\right].$$

$m_t = 172.76 \pm 0.30$ GeV ; $G_U = 0.0071923855$; $G_D = 0.0169194504$

((((0.0071923855*0.0169194504*172.76) / (16Pi^2) * 65.4582 * [((125.18^2 ln(125.18^2) – 172.76^2 ln(172.76^2))) / (125.18^2 – 172.76^2)])))

Input interpretation:

$$\frac{0.0071923855\times 0.0169194504\times 172.76}{16\,\pi^2}\times 65.4582\times\frac{125.18^2\log(125.18^2)-172.76^2\log(172.76^2)}{125.18^2-172.76^2}$$

$\log(x)$ is the natural logarithm

Result:

0.0960000...

96 MeV = quark strange mass

Alternative representations:

$$((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)\,(16\,\pi^2))=\frac{1.37615\,(\log(a)\log_a(125.18^2)\,125.18^2-\log(a)\log_a(172.76^2)\,172.76^2)}{(125.18^2-172.76^2)\,(16\,\pi^2)}$$

$$((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\pi^2))=$$
$$\frac{1.37615\,(\log_e(125.18^2)\,125.18^2-\log_e(172.76^2)\,172.76^2)}{(125.18^2-172.76^2)(16\pi^2)}$$

$$((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\pi^2))=$$
$$\frac{1.37615\,(-\mathrm{Li}_1(1-125.18^2)\,125.18^2+\mathrm{Li}_1(1-172.76^2)\,172.76^2)}{(125.18^2-172.76^2)(16\pi^2)}$$

Series representations:

$$((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\pi^2))=$$
$$-\frac{0.0950743\log(15669.)}{\pi^2}+\frac{0.181084\log(29845.)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}-\frac{0.181084\,(-1)^k\,e^{-19.9632k}\left(e^{9.65944k}-0.525029\,e^{10.3038k}\right)}{k\,\pi^2}$$

$$((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\pi^2))=$$
$$-\frac{0.190149\,i\left\lfloor\frac{\arg(15670.-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.362168\,i\left\lfloor\frac{\arg(29846.-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.0860095\log(x)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.0950743\,(15670.-x)^k-0.181084\,(29846.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))$$
$$(0.00719239\times 0.0169195\times 172.76))/((125.18^2-172.76^2)(16\pi^2))=$$
$$-\frac{0.190149\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15670.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{0.362168\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{29846.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+$$
$$\frac{0.0860095\log(z_0)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.0950743\,(15670.-z_0)^k-0.181084\,(29846.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))}{(0.00719239\times 0.0169195\times 172.76))}\Big/ \frac{((125.18^2-172.76^2)(16\,\pi^2))}{} = \int_1^{15670.}\frac{0.045159+0.0860095\,t}{\pi^2\,t\,(-0.474987+t)}\,dt$$

$$\frac{((65.4582\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))}{(0.00719239\times 0.0169195\times 172.76))}\Big/ \frac{((125.18^2-172.76^2)(16\,\pi^2))}{} = \int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{0.0905419\,e^{-19.9632\,s}\left(e^{9.65944\,s}-0.525029\,e^{10.3038\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

For:

m_τ = 1776.86±0.12 MeV = 1.7769 GeV ; G_U = 0.0071923855

m_b = 4.18±0.03 GeV ; G_D = 0.0169194504

m_t = 172.76± 0.30 GeV ; $G_{\mathscr{L}}$ = 0.6992833139

λ = 247.052942 GeV

We have inserted the following values:

70.65

41105.3

65.4582

3.20472

We have that:

$\sum_N u_{3a}^{(N+)*} u_{i3}^{(N+)}$ quarks with charges 2/3

70.65; 41105.3

$\sum_N u_{3a}^{(N+)} u_{i3}^{(N+)*}$ quarks with charges -1/3

65.4582 ; 3.20472

We obtain:

(70.65 + 41105.3)-(65.4582+3.20472)

Input interpretation:

(70.65 + 41 105.3) – (65.4582 + 3.20472)

Result:

41107.28708

41107.28708

From the formula of coefficients of the '5th order' mock theta function $\psi_1(q)$: (A053261 OEIS Sequence)

sqrt(golden ratio) * exp(Pi*sqrt(n/15)) / (2*5^(1/4)*sqrt(n)), for n = 313

sqrt(golden ratio) * exp(Pi*sqrt(313/15)) / (2*5^(1/4)*sqrt(313)) +47

where 47 is a Lucas number

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{313}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{313}} + 47$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{\sqrt{313/15}\,\pi}\sqrt{\frac{\phi}{313}}}{2\sqrt[4]{5}}+47$$

Decimal approximation:

41107.734215967624554685586493634865401406854953326790302 39...

41107.7342….

Property:

$$47+\frac{e^{\sqrt{313/15}\,\pi}\sqrt{\frac{\phi}{313}}}{2\sqrt[4]{5}}$$ is a transcendental number

Alternate forms:

$$47+\frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{3130}}\;e^{\sqrt{313/15}\,\pi}$$

$$47+\frac{\sqrt{\frac{1}{626}\left(1+\sqrt{5}\right)}\;e^{\sqrt{313/15}\,\pi}}{2\sqrt[4]{5}}$$

$$\frac{294\,220+5^{3/4}\sqrt{626\left(1+\sqrt{5}\right)}\;e^{\sqrt{313/15}\,\pi}}{6260}$$

Series representations:

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{313}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{313}}+47=\left(470\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(313-z_0)^k z_0^{-k}}{k!}+5^{3/4}\right.$$
$$\left.\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{313}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\Big/$$
$$\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(313-z_0)^k z_0^{-k}}{k!}\right)\quad\text{for}\ (\text{not}\ (z_0\in\mathbb{R}\ \text{and}\ -\infty<z_0\le 0))$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{313}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{313}}+47=\left(470\exp\left(i\pi\left\lfloor\frac{\arg(313-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(313-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}+\right.$$
$$5^{3/4}\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{313}{15}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{313}{15}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\Bigg)\Big/$$
$$\left(10\exp\left(i\pi\left\lfloor\frac{\arg(313-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(313-x)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)$$
$$\text{for}\ (x\in\mathbb{R}\ \text{and}\ x<0)$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{313}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{313}}+47=\left(\left(\frac{1}{z_0}\right)^{-1/2\left\lfloor\arg(313-z_0)/(2\pi)\right\rfloor}z_0^{-1/2\left\lfloor\arg(313-z_0)/(2\pi)\right\rfloor}\right.$$
$$\left(470\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg(313-z_0)/(2\pi)\right\rfloor}z_0^{1/2\left\lfloor\arg(313-z_0)/(2\pi)\right\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(313-z_0)^k z_0^{-k}}{k!}+\right.$$
$$5^{3/4}\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg\left(\frac{313}{15}-z_0\right)/(2\pi)\right\rfloor}z_0^{1/2\left(1+\left\lfloor\arg\left(\frac{313}{15}-z_0\right)/(2\pi)\right\rfloor\right)}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{313}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\left\lfloor\arg(\phi-z_0)/(2\pi)\right\rfloor}$$
$$\left.z_0^{1/2\left\lfloor\arg(\phi-z_0)/(2\pi)\right\rfloor}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k z_0^{-k}}{k!}\right)\Big/$$
$$\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(313-z_0)^k z_0^{-k}}{k!}\right)$$

From the previous expression, we obtain also:

1/10((((70.65 + 41105.3)-(65.4582+3.20472))))-11-Pi-1/2

Input interpretation:

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2}$$

Result:

4096.09...

4096.09…. ≈ 4096 = 64^2

Alternative representations:

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2} = -\frac{23}{2} - 180^\circ + \frac{41\,107.3}{10}$$

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2} = -\frac{23}{2} + i\log(-1) + \frac{41\,107.3}{10}$$

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2} = -\frac{23}{2} - \cos^{-1}(-1) + \frac{41\,107.3}{10}$$

Series representations:

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2} = 4099.23 - 4\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2} = 4101.23 - 2\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$\frac{1}{10}((70.65 + 41\,105.3) - (65.4582 + 3.20472)) - 11 - \pi - \frac{1}{2} = 4099.23 - \sum_{k=0}^{\infty}\frac{2^{-k}(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$\frac{1}{10}\left((70.65+41\,105.3)-(65.4582+3.20472)\right)-11-\pi-\frac{1}{2}=4099.23-2\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$\frac{1}{10}\left((70.65+41\,105.3)-(65.4582+3.20472)\right)-11-\pi-\frac{1}{2}=$$
$$4099.23-4\int_0^{1}\sqrt{1-t^2}\,dt$$

$$\frac{1}{10}\left((70.65+41\,105.3)-(65.4582+3.20472)\right)-11-\pi-\frac{1}{2}=4099.23-2\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

And:

sqrt[1/10((((70.65 + 41105.3)-(65.4582+3.20472))))-11-Pi-1/2]

Input interpretation:

$$\sqrt{\frac{1}{10}\left((70.65+41\,105.3)-(65.4582+3.20472)\right)-11-\pi-\frac{1}{2}}$$

Result:

64.0007...

64.0007… ≈ 64

Series representations:

$$\sqrt{\frac{1}{10}\left((70.65+41\,105.3)-(65.4582+3.20472)\right)-11-\pi-\frac{1}{2}}=$$
$$\sqrt{4098.23-\pi}\sum_{k=0}^{\infty}(4098.23-\pi)^{-k}\binom{\frac{1}{2}}{k}$$

$$\sqrt{\frac{1}{10}\left((70.65+41\,105.3)-(65.4582+3.20472)\right)-11-\pi-\frac{1}{2}}=$$
$$\sqrt{4098.23-\pi}\sum_{k=0}^{\infty}\frac{(-1)^k\,(4098.23-\pi)^{-k}\left(-\frac{1}{2}\right)_k}{k!}$$

$$\sqrt{\frac{1}{10}\left((70.65 + 41\,105.3) - (65.4582 + 3.20472)\right) - 11 - \pi - \frac{1}{2}} = \sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (4099.23 - \pi - z_0)^k\, z_0^{-k}}{k!} \quad \text{for } (\text{not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

Now, we have:

$$m_\mu - m_{22}^{\mathcal{L}} - \frac{G_{\mathcal{L}}^2 m_\tau}{16\pi^2}\sum_N u_{32}^{(N0)} u_{23}^{(N0)*}\left[\frac{M_{N0}^2 \ln M_{N0}^2 - m_\tau^2 \ln m_\tau^2}{M_{N0}^2 - m_\tau^2}\right], \qquad (57)$$

$$m_s = m_{22}^{-1/3} = \frac{G_D^2 m_b}{16\pi^2}\sum_N u_{32}^{(N0)} u_{23}^{(N0)*}\left[\frac{M_{N0}^2 \ln M_{N0}^2 - m_b^2 \ln m_b^2}{M_{N0}^2 - m_b^2}\right], \qquad (58)$$

For the previous data:

m_τ = 1776.86±0.12 MeV = 1.7769 GeV ; G_U = 0.0071923855

m_b = 4.18±0.03 GeV ; G_D = 0.0169194504

m_t = 172.76± 0.30 GeV ; $G_{\mathcal{L}}$ = 0.6992833139

λ = 247.052942 GeV

we obtain:

$$m_\mu = m_{22}^{\mathcal{L}} = \frac{G_{\mathcal{L}}^2 m_\tau}{16\pi^2}\sum_N u_{32}^{(N0)} u_{23}^{(N0)*}\left[\frac{M_{N0}^2 \ln M_{N0}^2 - m_\tau^2 \ln m_\tau^2}{M_{N0}^2 - m_\tau^2}\right]$$

((((0.6992833139^2*1.7769) / (16Pi^2) * 1.9876* [((125.18^2 ln(125.18^2) – 1.7769^2 ln(1.7769^2))) / (125.18^2 – 1.7769^2)])))

Input interpretation:

$$\frac{0.6992833139^2 \times 1.7769}{16\,\pi^2} \times 1.9876 \times \frac{125.18^2 \log(125.18^2) - 1.7769^2 \log(1.7769^2)}{125.18^2 - 1.7769^2}$$

$\log(x)$ is the natural logarithm

Result:

0.105660...

0.105660…

Input interpretation:

convert 0.105660 GeV (gigaelectronvolts) to megaelectronvolts

Result:

105.66 MeV (megaelectronvolts)

105.66 MeV = lepton muon mass

Alternative representations:

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=\frac{3.53177\times 0.699283^2\,(-\log(a)\log_a(1.7769^2)\,1.7769^2+\log(a)\log_a(125.18^2)\,125.18^2)}{(-1.7769^2+125.18^2)\,(16\,\pi^2)}$$

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=\frac{3.53177\times 0.699283^2\,(-\log_e(1.7769^2)\,1.7769^2+\log_e(125.18^2)\,125.18^2)}{(-1.7769^2+125.18^2)\,(16\,\pi^2)}$$

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=\frac{3.53177\times 0.699283^2\,(\mathrm{Li}_1(1-1.7769^2)\,1.7769^2-\mathrm{Li}_1(1-125.18^2)\,125.18^2)}{(-1.7769^2+125.18^2)\,(16\,\pi^2)}$$

Series representations:

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=-\frac{0.0000217531\log(2.15737)}{\pi^2}+\frac{0.107961\log(15\,669.)}{\pi^2}+\sum_{k=1}^{\infty}-\frac{0.107961\,(-1)^k\,e^{-10.4283\,k}\left(e^{0.768892\,k}-0.000201491\,e^{9.65944\,k}\right)}{k\,\pi^2}$$

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=$$
$$-\frac{0.0000435063\,i\left\lfloor\frac{\arg(3.15737-x)}{2\,\pi}\right\rfloor}{\pi}+\frac{0.215921\,i\left\lfloor\frac{\arg(15670.-x)}{2\,\pi}\right\rfloor}{\pi}+\frac{0.107939\log(x)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.0000217531\,(3.15737-x)^k-0.107961\,(15670.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=$$
$$-\frac{0.0000435063\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{3.15737}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor}{\pi}+$$
$$\frac{0.215921\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15670.}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor}{\pi}+\frac{0.107939\log(z_0)}{\pi^2}+$$
$$\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.0000217531\,(3.15737-z_0)^k-0.107961\,(15670.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=$$
$$\int_1^{3.15737}\frac{0.0000217501+0.107939\,t}{\pi^2\,t\,(-0.999862+t)}\,dt$$

$$\frac{(1.9876\,(125.18^2\log(125.18^2)-1.7769^2\log(1.7769^2)))\,(0.699283^2\times 1.7769)}{(125.18^2-1.7769^2)\,(16\,\pi^2)}=$$
$$\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{0.0539804\,e^{-10.4283\,s}\left(e^{0.768892\,s}-0.000201491\,e^{9.65944\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds$$
$$\text{for } -1<\gamma<0$$

$$m_s = m_{22}^{-1/3} = \frac{G_D^2 m_b}{16\pi^2} \sum_N u_{32}^{(N0)} u_{23}^{(N0)*} \left[\frac{M_{N0}^2 \ln M_{N0}^2 - m_b^2 \ln m_b^2}{M_{N0}^2 - m_b^2} \right]$$

m_b = 4.18±0.03 GeV ; G_D = 0.0169194504

((((0.0169194504^2*4.18) / (16Pi^2) *1310.53 [((125.18^2 ln(125.18^2) – 4.18^2 ln(4.18^2))) / (125.18^2 – 4.18^2)]))

Input interpretation:

$$\frac{0.0169194504^2 \times 4.18}{16\,\pi^2} \times 1310.53 \times \frac{125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)}{125.18^2 - 4.18^2}$$

$\log(x)$ is the natural logarithm

Result:

0.0960002...

0.0960002…

Input interpretation:

convert 0.0960002 GeV (gigaelectronvolts) to megaelectronvolts

Result:

96.0002 MeV (megaelectronvolts)

96 MeV quark strange mass

Alternative representations:

$$\frac{(1310.53\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.0169195^2 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} =$$
$$\frac{5478.02 \times 0.0169195^2\,(-\log(a) \log_a(4.18^2)\,4.18^2 + \log(a) \log_a(125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=\frac{5478.02\times 0.0169195^2\,(-\log_e(4.18^2)\,4.18^2+\log_e(125.18^2)\,125.18^2)}{(-4.18^2+125.18^2)\,(16\,\pi^2)}$$

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=\frac{5478.02\times 0.0169195^2\,(\mathrm{Li}_1(1-4.18^2)\,4.18^2-\mathrm{Li}_1(1-125.18^2)\,125.18^2)}{(-4.18^2+125.18^2)\,(16\,\pi^2)}$$

Series representations:

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=-\frac{0.000109406\log(16.4724)}{\pi^2}+\frac{0.0981206\log(15\,669.)}{\pi^2}+\sum_{k=1}^{\infty}-\frac{0.0981206\,(-1)^k\,e^{-12.4611\,k}\left(e^{2.80169\,k}-0.00111502\,e^{9.65944\,k}\right)}{k\,\pi^2}$$

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=-\frac{0.000218813\,i\left\lfloor\frac{\arg(17.4724-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.196241\,i\left\lfloor\frac{\arg(15\,670.-x)}{2\pi}\right\rfloor}{\pi}+\frac{0.0980112\log(x)}{\pi^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.000109406\,(17.4724-x)^k-0.0981206\,(15\,670.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=-\frac{0.000218813\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{17.4724}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{0.196241\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15\,670.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi}+\frac{0.0980112\log(z_0)}{\pi^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\left(0.000109406\,(17.4724-z_0)^k-0.0981206\,(15\,670.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=\int_1^{17.4724}\frac{0.000109291+0.0980112\,t}{\pi^2\,t\,(-0.998949+t)}\,dt$$

$$\frac{(1310.53\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195^2\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}=\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{0.0490603\,e^{-12.4611\,s}\left(e^{2.80169\,s}-0.00111502\,e^{9.65944\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds$$

for $-1<\gamma<0$

Results:

1.9876

1310.53 (note that 1310.53 + 1.9876 = 1312.5176, that is very near to the rest mass of Xi baryon 1314.86)

From the above two results, we obtain, after some calculations:

(1.9876 * 1310.53) * golden ratio-123+4+1/3

Input interpretation:

$$(1.9876\times 1310.53)\,\phi-123+4+\frac{1}{3}$$

ϕ is the golden ratio

Result:

4096.00...

$4096 = 64^2$

Alternative representations:

$$\phi\, 1.9876 \times 1310.53 - 123 + 4 + \frac{1}{3} = -\frac{356}{3} + 5209.62 \sin(54^\circ)$$

$$\phi\, 1.9876 \times 1310.53 - 123 + 4 + \frac{1}{3} = -\frac{356}{3} - 5209.62 \cos(216^\circ)$$

$$\phi\, 1.9876 \times 1310.53 - 123 + 4 + \frac{1}{3} = -\frac{356}{3} - 5209.62 \sin(666^\circ)$$

And:

sqrt[(1.9876 * 1310.53) * golden ratio-123+4+1/3]

Input interpretation:

$$\sqrt{(1.9876 \times 1310.53)\,\phi - 123 + 4 + \frac{1}{3}}$$

ϕ is the golden ratio

Result:

64.0000...

$64 = 8^2$

All 2nd roots of 4096.:

$64.\, e^0 \approx 64.000$ (real, principal root)

$64.\, e^{i\pi} \approx -64.000$ (real root)

Series representations:

$$\sqrt{\phi\, 1.9876 \times 1310.53 - 123 + 4 + \frac{1}{3}} = \sqrt{-119.667 + 2604.81\,\phi}\ \sum_{k=0}^{\infty} (-119.667 + 2604.81\,\phi)^{-k} \binom{\frac{1}{2}}{k}$$

$$\sqrt{\phi\, 1.9876 \times 1310.53 - 123 + 4 + \frac{1}{3}} = \sqrt{-119.667 + 2604.81\,\phi}\ \sum_{k=0}^{\infty} \frac{(-1)^k\, (-119.667 + 2604.81\,\phi)^{-k} \left(-\frac{1}{2}\right)_k}{k!}$$

$$\sqrt{\phi\, 1.9876 \times 1310.53 - 123 + 4 + \frac{1}{3}} = \sqrt{z_0}\ \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k\, (-118.667 + 2604.81\,\phi - z_0)^k\, z_0^{-k}}{k!}$$

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

Now, we have:

$$m_c = m_{22}^{+2/3} = \frac{G_U G_D m_b}{16\pi^2} \sum_N u_{32}^{(N+)*} u_{23}^{(N+)} \left[\frac{M_{N+}^2 \ln M_{N+}^2 - m_b^2 \ln m_b^2}{M_{N+}^2 - m_b^2} \right], \tag{55}$$

$$m_s = m_{22}^{-1/3} = \frac{G_U G_D m_t}{16\pi^2} \sum_N u_{32}^{(N+)} u_{23}^{(N+)*} \left[\frac{M_{N+}^2 \ln M_{N+}^2 - m_t^2 \ln m_t^2}{M_{N+}^2 - m_t^2} \right], \tag{56}$$

$G_U = 0.0071923855$; $G_D = 0.0169194504$

$m_t = 172.76 \pm 0.30$ GeV ; $m_b = 4.18 \pm 0.03$ GeV

((((0.0169194504*0.0071923855*4.18) / (16Pi^2) * 41105.3 * [((125.18^2 ln(125.18^2) – 4.18^2 ln(4.18^2))) / (125.18^2 – 4.18^2)]))

Input interpretation:

$$\frac{0.0169194504 \times 0.0071923855 \times 4.18}{16\,\pi^2} \times 41\,105.3 \times \frac{125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)}{125.18^2 - 4.18^2}$$

$\log(x)$ is the natural logarithm

Result:

1.28000...

1.28 GeV quark charm mass

Alternative representations:

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.0169195 \times 0.00719239 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = \frac{20.909\,(-\log(a) \log_a(4.18^2)\,4.18^2 + \log(a) \log_a(125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.0169195 \times 0.00719239 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = \frac{20.909\,(-\log_e(4.18^2)\,4.18^2 + \log_e(125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.0169195 \times 0.00719239 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = \frac{20.909\,(\mathrm{Li}_1(1 - 4.18^2)\,4.18^2 - \mathrm{Li}_1(1 - 125.18^2)\,125.18^2)}{(-4.18^2 + 125.18^2)\,(16\,\pi^2)}$$

Series representations:

$$\frac{(41\,105.3\,(125.18^2 \log(125.18^2) - 4.18^2 \log(4.18^2)))\,(0.0169195 \times 0.00719239 \times 4.18)}{(125.18^2 - 4.18^2)\,(16\,\pi^2)} = -\frac{0.00145875 \log(16.4724)}{\pi^2} + \frac{1.30827 \log(15\,669.)}{\pi^2} + \sum_{k=1}^{\infty} -\frac{1.30827\,(-1)^k\,e^{-12.4611\,k}\left(e^{2.80169\,k} - 0.00111502\,e^{9.65944\,k}\right)}{k\,\pi^2}$$

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195\times 0.00719239\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$
$$= -\frac{0.0029175\,i\left\lfloor\frac{\arg(17.4724-x)}{2\pi}\right\rfloor}{\pi} + \frac{2.61654\,i\left\lfloor\frac{\arg(15\,670.-x)}{2\pi}\right\rfloor}{\pi} + \frac{1.30681\log(x)}{\pi^2} + \sum_{k=1}^{\infty}\frac{(-1)^k\left(0.00145875\,(17.4724-x)^k-1.30827\,(15\,670.-x)^k\right)x^{-k}}{k\,\pi^2} \quad \text{for } x<0$$

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195\times 0.00719239\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)}$$
$$= -\frac{0.0029175\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{17.4724}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi} + \frac{2.61654\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15\,670.}{z_0}\right)+\arg(z_0)}{2\pi}\right\rfloor}{\pi} + \frac{1.30681\log(z_0)}{\pi^2} + \sum_{k=1}^{\infty}\frac{(-1)^k\left(0.00145875\,(17.4724-z_0)^k-1.30827\,(15\,670.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195\times 0.00719239\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)} = \int_1^{17.4724}\frac{0.00145722+1.30681\,t}{\pi^2\,t\,(-0.998949+t)}\,dt$$

$$\frac{(41\,105.3\,(125.18^2\log(125.18^2)-4.18^2\log(4.18^2)))\,(0.0169195\times 0.00719239\times 4.18)}{(125.18^2-4.18^2)\,(16\,\pi^2)} = \int_{-i\infty+\gamma}^{i\infty+\gamma}\frac{0.654136\,e^{-12.4611\,s}\left(e^{2.80169\,s}-0.00111502\,e^{9.65944\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds \quad \text{for } -1<\gamma<0$$

$$m_{ai}^{-1/3} = \frac{G_U G_D m_t}{16\pi^2}\sum_N u_{3a}^{(N+)}\,u_{i3}^{(N+)*}\left[\frac{M_{N+}^2\ln M_{N+}^2 - m_t^2\ln m_t^2}{M_{N+}^2-m_t^2}\right]$$

$G_U = 0.0071923855$; $G_D = 0.0169194504$; $m_t = 172.76 \pm 0.30$ GeV ;

((((0.0169194504*0.0071923855*172.76) / (16Pi^2) *171.048 * [((125.18^2 ln(125.18^2) – 172.76^2 ln(172.76^2))) / (125.18^2 – 172.76^2)]))

Input interpretation:

$$\frac{0.0169194504 \times 0.0071923855 \times 172.76}{16\,\pi^2} \times 65.4582 \times \frac{125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)}{125.18^2 - 172.76^2}$$

$\log(x)$ is the natural logarithm

Result:

0.0960000...

96 MeV quark strange mass

Alternative representations:

$$((65.4582\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.0169195 \times 0.00719239 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \frac{1.37615\,(\log(a) \log_a(125.18^2)\,125.18^2 - \log(a) \log_a(172.76^2)\,172.76^2)}{(125.18^2 - 172.76^2)(16\,\pi^2)}$$

$$((65.4582\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.0169195 \times 0.00719239 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \frac{1.37615\,(\log_e(125.18^2)\,125.18^2 - \log_e(172.76^2)\,172.76^2)}{(125.18^2 - 172.76^2)(16\,\pi^2)}$$

$$((65.4582\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.0169195 \times 0.00719239 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \frac{1.37615\,(-\mathrm{Li}_1(1 - 125.18^2)\,125.18^2 + \mathrm{Li}_1(1 - 172.76^2)\,172.76^2)}{(125.18^2 - 172.76^2)(16\,\pi^2)}$$

Integral representations:

$$((65.4582\,(125.18^2 \log(125.18^2) - 172.76^2 \log(172.76^2)))\,(0.0169195 \times 0.00719239 \times 172.76))/((125.18^2 - 172.76^2)(16\,\pi^2)) = \int_1^{15670.} \frac{0.045159 + 0.0860095\,t}{\pi^2\,t\,(-0.474987 + t)}\,dt$$

$$((65.4582\,(125.18^2\,\log(125.18^2) - 172.76^2\,\log(172.76^2)))$$
$$(0.0169195 \times 0.00719239 \times 172.76))/((125.18^2 - 172.76^2)\,(16\,\pi^2)) =$$
$$\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma} \frac{0.0905419\,e^{-19.9632\,s}\,(e^{9.65944\,s} - 0.525029\,e^{10.3038\,s})\,\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds$$

for $-1 < \gamma < 0$

$\Gamma(x)$ is the gamma function

Now, we have:

$$m_c = m_{22}^{+2/3} = \frac{G_U^2 m_t}{16\pi^2} \sum_N u_{32}^{(N0)*}\, u_{23}^{(N0)} \left[\frac{M_{N0}^2 \ln M_{N0}^2 - m_t^2 \ln m_t^2}{M_{N0}^2 - m_t^2}\right] . \quad (59)$$

$G_U = 0.0071923855$; $m_t = 172.76 \pm 0.30$ GeV ;

((((0.0071923855^2*172.76) / (16Pi^2) * 2053.13 * [((125.18^2 ln(125.18^2) – 172.76^2 ln(172.76^2))) / (125.18^2 – 172.76^2)])))

Input interpretation:

$$\frac{0.0071923855^2 \times 172.76}{16\,\pi^2} \times 2053.13 \times \frac{125.18^2\,\log(125.18^2) - 172.76^2\,\log(172.76^2)}{125.18^2 - 172.76^2}$$

$\log(x)$ is the natural logarithm

Result:

1.28000...

1.28 GeV quark charm mass

Alternative representations:

$$\frac{(2053.13\,(125.18^2\,\log(125.18^2) - 172.76^2\,\log(172.76^2)))\,(0.00719239^2 \times 172.76)}{(125.18^2 - 172.76^2)\,(16\,\pi^2)} =$$
$$(354699. \times 0.00719239^2$$
$$(\log(a)\,\log_a(125.18^2)\,125.18^2 - \log(a)\,\log_a(172.76^2)\,172.76^2))/$$
$$((125.18^2 - 172.76^2)\,(16\,\pi^2))$$

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=\frac{354\,699.\times 0.00719239^2\,(\log_e(125.18^2)\,125.18^2-\log_e(172.76^2)\,172.76^2)}{(125.18^2-172.76^2)\,(16\,\pi^2)}$$

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=\frac{354\,699.\times 0.00719239^2\,(-\mathrm{Li}_1(1-125.18^2)\,125.18^2+\mathrm{Li}_1(1-172.76^2)\,172.76^2)}{(125.18^2-172.76^2)\,(16\,\pi^2)}$$

Series representations:

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=-\frac{1.26766\log(15\,669.)}{\pi^2}+\frac{2.41445\log(29\,845.)}{\pi^2}+\sum_{k=1}^{\infty}-\frac{2.41445\,(-1)^k\,e^{-19.9632\,k}\left(e^{9.65944\,k}-0.525029\,e^{10.3038\,k}\right)}{k\,\pi^2}$$

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=-\frac{2.53532\,i\left\lfloor\frac{\arg(15\,670.-x)}{2\,\pi}\right\rfloor}{\pi}+\frac{4.82891\,i\left\lfloor\frac{\arg(29\,846.-x)}{2\,\pi}\right\rfloor}{\pi}+\frac{1.14679\log(x)}{\pi^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\left(1.26766\,(15\,670.-x)^k-2.41445\,(29\,846.-x)^k\right)x^{-k}}{k\,\pi^2}\quad\text{for } x<0$$

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=-\frac{2.53532\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{15\,670.}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor}{\pi}+\frac{4.82891\,i\left\lfloor-\frac{-\pi+\arg\left(\frac{29\,846.}{z_0}\right)+\arg(z_0)}{2\,\pi}\right\rfloor}{\pi}+\frac{1.14679\log(z_0)}{\pi^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\left(1.26766\,(15\,670.-z_0)^k-2.41445\,(29\,846.-z_0)^k\right)z_0^{-k}}{k\,\pi^2}$$

Integral representations:

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=\int_1^{15\,670.}\frac{0.602121+1.14679\,t}{\pi^2\,t\,(-0.474987+t)}\,dt$$

$$\frac{(2053.13\,(125.18^2\log(125.18^2)-172.76^2\log(172.76^2)))\,(0.00719239^2\times 172.76)}{(125.18^2-172.76^2)\,(16\,\pi^2)}=\int_{-i\,\infty+\gamma}^{i\,\infty+\gamma}\frac{1.20723\,e^{-19.9632\,s}\left(e^{9.65944\,s}-0.525029\,e^{10.3038\,s}\right)\Gamma(-s)^2\,\Gamma(1+s)}{i\,\pi^3\,\Gamma(1-s)}\,ds\quad\text{for}\quad -1<\gamma<0$$

Results:

41105.3

171.048

2053.13

From the sum of the above results, we obtain:

(41105.3 + 171.048 + 2053.13)

Input interpretation:

41 105.3 + 171.048 + 2053.13

Result:

43329.478

43329.478

From the formula of coefficients of the '5th order' mock theta function $\psi_1(q)$: (A053261 OEIS Sequence)

sqrt(golden ratio) * exp(Pi*sqrt(n/15)) / (2*5^(1/4)*sqrt(n)) for n = 316

sqrt(golden ratio) * exp(Pi*sqrt(316/15)) / (2*5^(1/4)*sqrt(316))-322-123+7

where 7, 123 and 322 are Lucas numbers

Input:

$$\sqrt{\phi} \times \frac{\exp\left(\pi \sqrt{\frac{316}{15}}\right)}{2\sqrt[4]{5}\,\sqrt{316}} - 322 - 123 + 7$$

ϕ is the golden ratio

Exact result:

$$\frac{e^{2\sqrt{79/15}\,\pi}\sqrt{\frac{\phi}{79}}}{4\sqrt[4]{5}} - 438$$

Decimal approximation:

43329.547685736790105412047044598063111851602979997806954 33...

43329.547685…

Property:

$$-438 + \frac{e^{2\sqrt{79/15}\,\pi}\sqrt{\frac{\phi}{79}}}{4\sqrt[4]{5}}$$ is a transcendental number

Alternate forms:

$$\frac{1}{4}\sqrt{\frac{1}{790}\left(5+\sqrt{5}\right)}\,e^{2\sqrt{79/15}\,\pi} - 438$$

$$\frac{\sqrt{\frac{1}{158}\left(1+\sqrt{5}\right)}\,e^{2\sqrt{79/15}\,\pi}}{4\sqrt[4]{5}} - 438$$

$$\frac{5^{3/4}\sqrt{158\left(1+\sqrt{5}\right)}\,e^{2\sqrt{79/15}\,\pi} - 1384080}{3160}$$

Series representations:

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{316}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{316}} - 322 - 123 + 7 = \left(-4380\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k (316-z_0)^k\, z_0^{-k}}{k!} + 5^{3/4}\right.$$
$$\left.\exp\left(\pi\sqrt{z_0}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{316}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\, z_0^{-k}}{k!}\right)\Big/$$
$$\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(316-z_0)^k\, z_0^{-k}}{k!}\right) \text{ for } (\text{not } (z_0 \in \mathbb{R} \text{ and } -\infty < z_0 \le 0))$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{316}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{316}} - 322 - 123 + 7 =$$
$$\left(-4380\exp\left(i\pi\left\lfloor\frac{\arg(316-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(316-x)^k\, x^{-k}\left(-\frac{1}{2}\right)_k}{k!} + \right.$$
$$5^{3/4}\exp\left(i\pi\left\lfloor\frac{\arg(\phi-x)}{2\pi}\right\rfloor\right)\exp\left(\pi\exp\left(i\pi\left\lfloor\frac{\arg\left(\frac{316}{15}-x\right)}{2\pi}\right\rfloor\right)\sqrt{x}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{316}{15}-x\right)^k x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right)\sum_{k=0}^{\infty}\frac{(-1)^k(\phi-x)^k\, x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\Bigg)\Big/$$
$$\left(10\exp\left(i\pi\left\lfloor\frac{\arg(316-x)}{2\pi}\right\rfloor\right)\sum_{k=0}^{\infty}\frac{(-1)^k(316-x)^k\, x^{-k}\left(-\frac{1}{2}\right)_k}{k!}\right) \text{ for } (x \in \mathbb{R} \text{ and } x < 0)$$

$$\frac{\sqrt{\phi}\ \exp\left(\pi\sqrt{\frac{316}{15}}\right)}{2\sqrt[4]{5}\ \sqrt{316}} - 322 - 123 + 7 =$$

$$\left(\left(\frac{1}{z_0}\right)^{-1/2\,[\arg(316-z_0)/(2\pi)]}\ z_0^{-1/2\,[\arg(316-z_0)/(2\pi)]}\left(-4380\left(\frac{1}{z_0}\right)^{1/2\,[\arg(316-z_0)/(2\pi)]}\right.\right.$$
$$z_0^{1/2\,[\arg(316-z_0)/(2\pi)]}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(316-z_0)^k\,z_0^{-k}}{k!} +$$
$$5^{3/4}\exp\left(\pi\left(\frac{1}{z_0}\right)^{1/2\left[\arg\left(\frac{316}{15}-z_0\right)/(2\pi)\right]}\ z_0^{1/2\left(1+\left[\arg\left(\frac{316}{15}-z_0\right)/(2\pi)\right]\right)}\right.$$
$$\left.\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k\left(\frac{316}{15}-z_0\right)^k z_0^{-k}}{k!}\right)\left(\frac{1}{z_0}\right)^{1/2\,[\arg(\phi-z_0)/(2\pi)]}$$
$$\left.\left.z_0^{1/2\,[\arg(\phi-z_0)/(2\pi)]}\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(\phi-z_0)^k\,z_0^{-k}}{k!}\right)\right)\Big/$$
$$\left(10\sum_{k=0}^{\infty}\frac{(-1)^k\left(-\frac{1}{2}\right)_k(316-z_0)^k\,z_0^{-k}}{k!}\right)$$

Now, we take the results

105.66 MeV = lepton muon mass

96 MeV = quark strange mass

1.28 GeV = 1280 MeV quark charm mass

4.7 MeV = quark down mass

2.2 MeV = quark up mass

From the following sum (only the quarks), we obtain:

(96 +1280 + 4.7 + 2.2) MeV

1382.9 MeV value equal to the rest mass of Sigma baryon 1382.8 MeV

We have the following observations:

Input interpretation:

$(96 + 1280 + 4.7 + 2.2)\ \mathrm{MeV}/c^2$

Unit conversions:

$1.383\ \text{GeV}/c^2$

2.465×10^{-24} grams

2.465×10^{-27} kg (kilograms)

Comparisons:

$\approx 0.74 \times$ deuteron mass ($\approx 3.3 \times 10^{-27}$ kg)

$\approx 0.78 \times$ tau particle mass ($\approx 3.2 \times 10^{-27}$ kg)

$\approx 1.5 \times$ proton mass ($\approx 1.7 \times 10^{-27}$ kg)

Interpretation:

mass

Corresponding quantities:

Relativistic energy E from $E = mc^2$:

1.4 GeV (gigaelectronvolts)

Characteristic length L from $L = h/(mc)$:

897 am (attometers)

9×10^{-16} meters

Thermal de Broglie wavelength at 100 K from $\lambda = h/(2\pi mkT)^{1/2}$:

143 pm (picometers)

Characteristic time T from $T = h/(mc^2)$:

3×10^{-24} seconds

Thermodynamic temperature T from $kT = mc^2$:

1.605×10^{13} K (kelvins)

Compton frequency ν from $\nu = mc^2/h$:

3.344×10^{23} Hz (hertz)

And in conclusion, we obtain:

(96 +1280 + 4.7 + 2.2)*Pi - 248 - 1/2

Input:

$$(96 + 1280 + 4.7 + 2.2)\,\pi - 248 - \frac{1}{2}$$

Result:

4096.0085...

4096.0085.... $\approx 4096 = 64^2$

Alternative representations:

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-\frac{497}{2}+248\,922.^\circ$$

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-\frac{497}{2}-1382.9\,i\log(-1)$$

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-\frac{497}{2}+1382.9\cos^{-1}(-1)$$

Series representations:

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-248.5+5531.6\sum_{k=0}^{\infty}\frac{(-1)^k}{1+2k}$$

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-3014.3+2765.8\sum_{k=1}^{\infty}\frac{2^k}{\binom{2k}{k}}$$

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-248.5+1382.9\sum_{k=0}^{\infty}\frac{2^{-k}\,(-6+50k)}{\binom{3k}{k}}$$

Integral representations:

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-248.5+2765.8\int_0^{\infty}\frac{1}{1+t^2}\,dt$$

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-248.5+5531.6\int_0^{1}\sqrt{1-t^2}\,dt$$

$$(96+1280+4.7+2.2)\,\pi-248-\frac{1}{2}=-248.5+2765.8\int_0^{\infty}\frac{\sin(t)}{t}\,dt$$

and:

sqrt((((96 +1280 + 4.7 + 2.2)*Pi - 248 - 1/2)))

Input:

$$\sqrt{(96 + 1280 + 4.7 + 2.2)\,\pi - 248 - \frac{1}{2}}$$

Result:

64.0000663...

$64.0000663\ldots \approx 64 = 8^2$

All 2nd roots of 4096.01:

$64.0001\,e^{0} \approx 64.000$ (real, principal root)

$64.0001\,e^{i\pi} \approx -64.000$ (real root)

Series representations:

$$\sqrt{(96 + 1280 + 4.7 + 2.2)\,\pi - 248 - \frac{1}{2}} = \sqrt{-249.5 + 1382.9\,\pi}\ \sum_{k=0}^{\infty} (-249.5 + 1382.9\,\pi)^{-k} \binom{\frac{1}{2}}{k}$$

$$\sqrt{(96 + 1280 + 4.7 + 2.2)\,\pi - 248 - \frac{1}{2}} = \sqrt{-249.5 + 1382.9\,\pi}\ \sum_{k=0}^{\infty} \frac{(-1)^k\,(-249.5 + 1382.9\,\pi)^{-k} \left(-\frac{1}{2}\right)_k}{k!}$$

$$\sqrt{(96 + 1280 + 4.7 + 2.2)\,\pi - 248 - \frac{1}{2}} = \sqrt{z_0}\ \sum_{k=0}^{\infty} \frac{(-1)^k \left(-\frac{1}{2}\right)_k (-248.5 + 1382.9\,\pi - z_0)^k\, z_0^{-k}}{k!}$$

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

From the previous sum, after some calculations, we obtain also:

8(41105.3 + 171.048 + 2053.13)^1/2 + 64 – 1/4

Input interpretation:

$$8\sqrt{41\,105.3 + 171.048 + 2053.13} + 64 - \frac{1}{4}$$

Result:

1729.01...

1729.01

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)

(41105.3 + 171.048 + 2053.13)^1/2 - 76 +7

Input interpretation:

$$\sqrt{41\,105.3 + 171.048 + 2053.13} - 76 + 7$$

Result:

139.157...

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

(41105.3 + 171.048 + 2053.13)^1/2 - 76 -7

Input interpretation:

$$\sqrt{41\,105.3 + 171.048 + 2053.13} - 76 - 7$$

Result:

125.157...

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

We have also:

(41105.3 + 171.048 + 2053.13)^1/2 - 76 +3

Input interpretation:

$\sqrt{41\,105.3 + 171.048 + 2053.13} - 76 + 3$

Result:

135.157...

135.157… ≈ 135

(41105.3 + 171.048 + 2053.13)^1/2 - 76 + 4 + 2

Input interpretation:

$\sqrt{41\,105.3 + 171.048 + 2053.13} - 76 + 4 + 2$

Result:

138.157...

138.157… ≈ 138

(41105.3 + 171.048 + 2053.13)^1/2 -34-2

Input interpretation:

$\sqrt{41\,105.3 + 171.048 + 2053.13} - 34 - 2$

Result:

172.157...

172.157… ≈ 172

Furthermore, from the same previous sum, we obtain, after some calculations:

(41105.3 + 171.048 + 2053.13)

(41105.3 + 171.048 + 2053.13)/Pi+610-89-55

Input interpretation:

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55$$

Result:

14258.2…

14258.2… ≈ 14258

Alternative representations:

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{43\,329.5}{180^\circ}$$

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + -\frac{43\,329.5}{i \log(-1)}$$

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{43\,329.5}{\cos^{-1}(-1)}$$

Series representations:

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{10\,832.4}{\sum_{k=0}^{\infty} \frac{(-1)^k}{1+2k}}$$

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{21\,664.7}{-1 + \sum_{k=1}^{\infty} \frac{2^k}{\binom{2k}{k}}}$$

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{43\,329.5}{\sum_{k=0}^{\infty} \frac{2^{-k}(-6+50k)}{\binom{3k}{k}}}$$

Integral representations:

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{21\,664.7}{\int_0^{\infty} \frac{1}{1+t^2}\,dt}$$

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{10\,832.4}{\int_0^1 \sqrt{1 - t^2}\, dt}$$

$$\frac{41\,105.3 + 171.048 + 2053.13}{\pi} + 610 - 89 - 55 = 466 + \frac{21\,664.7}{\int_0^\infty \frac{\sin(t)}{t}\, dt}$$

(41105.3 + 171.048 + 2053.13)/4 + 322 + 7

Input interpretation:

$$\frac{1}{4}(41\,105.3 + 171.048 + 2053.13) + 322 + 7$$

Result:

11161.3695

11161.3695 ≈ 11161

(41105.3 + 171.048 + 2053.13)/4 + 610+21+5

Input interpretation:

$$\frac{1}{4}(41\,105.3 + 171.048 + 2053.13) + 610 + 21 + 5$$

Result:

11468.3695

11468.3695 ≈ 11468

All the latest results that we have obtained belong to the Ramanujan taxicab numbers listed below:

$$135^3 + 138^3 = 172^3 - 1$$

$$11161^3 + 11468^3 = 14258^3 + 1$$

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 ζ(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.

References

Models of Lepton and Quark Masses - *Steven Weinberg* ***** Theory Group, Department of Physics, University of Texas **-** Austin, TX, 78712 - arXiv:2001.06582v1 [hep-th] 18 Jan 2020