**Abstract:** We make the following *Ansatz* for the mass ratio of the neutron to the electron:

$$m_n/m_e \approx (4\pi)(4\pi - 1/\pi)(4\pi - 2/\pi) + \ln(4\pi) = 1838.682763 \qquad (1)$$

where $m_n$ is the neutron rest mass and $m_e$ is the electron rest mass. The CODATA value is 1838.68366158. The neutron decays into a proton and an electron. If $\ln(4\pi)$ is the neutron-proton mass difference, then $m_p/m_e \approx (4\pi)(4\pi - 1/\pi)(4\pi - 2/\pi)$, where $m_p$ is the proton rest mass.[1][2]

**Mass Ratio:** The two particles whose rest masses are most often studied are the electron and the proton. The electron is considered to be a fundamental particle.[3] The electron is also considered to be a perfect ball (solid sphere).[4] The proton, on the other hand is claimed to be composed of fundamental particles, such as quarks, color, and gluons.[5]

**The Formulas:** Consider the following expression:

$$\frac{m_n}{m_e} \approx (4\pi)\left(4\pi - \frac{1}{\pi}\right)\left(4\pi - \frac{2}{\pi}\right) + \ln(4\pi) = 1838.682763 \qquad (2)$$

where $m_n$ is the neutron rest mass and $m_e$ is the electron rest mass. The CODATA value is 1838.68366158.[6] The neutron decays into a proton and an electron. If $\ln(4\pi)$ is the neutron-proton mass difference, then $m_p/m_e \approx (4\pi)(4\pi - 1/\pi)(4\pi - 2/\pi)$, where $m_p$ is the proton rest mass.

$$\frac{m_p}{m_e} \approx (4\pi)\left(4\pi - \frac{1}{\pi}\right)\left(4\pi - \frac{2}{\pi}\right) = 1836.151739\ldots \qquad (3)$$

The Higgs Boson ($H^0$) to electron mass ratio can also be approximated:

$$\frac{m_{H^0}}{m_e} \approx \frac{m_p}{m_e} \cdot \left(4\pi - \frac{3}{\pi}\right)\left(4\pi - \frac{4}{\pi}\right) \qquad (4)$$

[1]https://en.wikipedia.org/ wiki/Isospin

[2]https://arxiv.org /abs/hep-lat/0608023

[3]https://www.google.com/search?client=ubuntu&channel=fs&q=electron+fundamental&ie=utf-8&oe=utf-8

[4]https://www.sciencedaily.com/releases/2011/05/110525131707.htm

[5]https://www.reddit.com/r/askscience/comments/1trc8h/are-electrons-protons-and-neutrons-actually/

[6]https://physics.nist.gov/cgi-bin/cuu/Value?mnsmesearch_for=neutron+mass

For convenience, we look at the mass ratio of the Higgs Boson to the proton[7]

$$\frac{m_{H^0}}{m_p} \approx \left(4\pi - \frac{3}{\pi}\right)\left(4\pi - \frac{4}{\pi}\right) = 131.1295246\ldots \tag{5}$$

This compares well with the current estimate of $(m_{H^0}/m_p)$ of 133.

**Geometry:** Associated with the number $m_p/m_e$, we have a variety of objects in solid geometry whose volume equals said number. Likewise, the mass differences between the $m_n$ and $m_p$ offer more information from their arithmetic value.

The tri-axial ellipsoid with semi-axes $\{4\pi, (4\pi - 1/\pi), (4\pi - 2/\pi)\}$ has a volume in 3D of $(4\pi)(4\pi - 1/\pi)(4\pi - 2/\pi)$. The ball (solid ellipsoid) of axis $= (4\pi - 1/\pi)$ with the ellipsoid of axes $\{(4\pi - 1/\pi), (1/\pi), (1/\pi)\}$ removed. The ball of axis $= (4\pi - 1/\pi)$ with the wedge (ungula) or sector of curved surface area of $(4\pi) \cdot (1/\pi)(1/\pi)$ removed.

[7] https://en.wikipedia.org/wiki/Higgs_boson