Possibly useful information:

$$\Delta\vec{r} = \vec{p}c\Delta u \qquad \Delta ct = E\Delta u \qquad \Delta\vec{p}c = \vec{F}E\Delta u \qquad \Delta E = \vec{F}\cdot\vec{p}c\Delta u$$

$$\gamma = \frac{1}{\sqrt{1-\beta^2}} \qquad \beta_{13} = \frac{\beta_{12}+\beta_{23}}{1+\beta_{12}\beta_{23}}$$

$$E = hf \qquad p = \frac{h}{\lambda}$$

$$\Delta x\Delta p_x c \geq \frac{\hbar c}{2} \qquad \Delta ct\Delta E \geq \frac{\hbar c}{2} \qquad \mathbf{p}_x = -i\hbar\frac{\partial}{\partial x}$$

$$A_0' = \gamma A_0 - \beta\gamma A_x$$
$$A_x' = \gamma A_x - \beta\gamma A_0$$
$$A_x' = A_y$$
$$A_z' = A_z$$

$$L = \hbar\sqrt{l(l+1)} \qquad L_z = \hbar m_l \qquad r = r_0 A^{1/3} \qquad r_0 = 1.2\text{ fm}$$

$$E = \frac{\hbar^2 k^2}{2m} \qquad k = \frac{n\pi}{L},\ n = 1,2,3\ldots \qquad T_{1/2} = \frac{\ln 2}{\lambda} = \frac{0.693}{\lambda} \qquad \frac{dN}{dt} = -\lambda N \text{ gives } N = N_o e^{-\lambda t}$$

$$E_n = \frac{-13.6\text{ eV}}{n^2} \qquad a_n = 0.0529\text{ nm}\, n^2$$

Quark composition of various particles:

p = uud n = ddu Λ^0=uds Σ^-=dds Σ^+=uus Ξ^-=dss Ξ^0=uss Ω^-=sss

$K^0 = d\bar{s}$ $K^+ = u\bar{s}$ $\pi^- = d\bar{u}$ $\pi^0 = u\bar{u} + d\bar{d} + s\bar{s}$ $\pi^+ = u\bar{d}$ $K^- = s\bar{u}$ $\bar{K}^0 = s\bar{d}$

$m = f_0/f_e$ $2nt = (m+\frac{1}{2})\lambda$ $\Delta r = d\sin\theta$ $\Delta\phi = kd\sin\theta$ $I_2 = I_1\cos^2\theta$

$TH = P + \rho gy + \frac{1}{2}\rho v^2$ $\Phi = Av$ $F_B = \rho Vg$ $v = \sqrt{T/\mu}$

$$y(x,t) = A\sin(kx \pm \omega t + \varphi) \qquad s(r,t) = \frac{A}{r}\sin(kr \pm \omega t + \varphi) \qquad f' = \frac{v \pm v_{observer}}{v \pm v_{source}} f_0$$

$$\beta = 10\log\left(\frac{I}{I_o}\right) \qquad \Delta E_{\text{int}} = Q + W \qquad W = -\int PdV \qquad Q = mc\Delta T,\ nC_V\Delta T,\ nC_P\Delta T,\ C\Delta T,\ mL$$

$$\Delta E_{\text{int}} = nC_V\Delta T \qquad PV = nRT = NkT \qquad PV^\gamma = C \qquad \gamma = C_P/C_V \qquad C_V = Rf/2 \qquad dS = dQ/T$$

$$|Q_{in}| + |W| = |Q_{out}| \qquad e = |W|/|Q_{in}| \qquad e = 1 - T_c/T_h$$

Constants

$h = 6.626\times10^{-34}$ J s $= 4.136\times10^{-21}$ MeV s $= 4.136\times10^{-15}$ eV s

$\hbar = 1.055\times10^{-34}$ J s $= 6.583\times10^{-22}$ MeV s $= 6.583\times10^{-16}$ eV s

$hc = 1.986\times10^{-25}$ J m $= 1240$ MeV fm $= 1240$ eV nm

$\hbar c = 3.162\times10^{-26}$ J m $= 197.4$ MeV fm $= 197.4$ eV nm

$c = 2.998\times10^8$ m/s $e = 1.602\times10^{-19}$ C $E_1 = -13.61$ eV $a_0 = 0.0529$ nm

$u = 1.660539\times10^{-27}$ kg $= 931.494$ MeV/c^2

$m_n = 1.008665$ u $= 939.565$ MeV/c^2 $m_e = 0.000549$ u $= 0.5110$ MeV/c^2

$m_p = 1.007276$ u $= 938.272$ MeV/c^2 $m_H = 1.007825$ u $= 938.783$ MeV/c^2

1 eV $= 1.602\times10^{-19}$ J $P_0 = 1.01\times10^5$ Pa $R = 8.314$ J/ (mol K)

$k_B = 1.381\times10^{-23}$ J/K $N_A = 6.022\times10^{23}$ part/mol 0 K = –273.15 °C

$g = 9.80$ m/s^2

n = 10^{-9} μ = 10^{-6} m = 10^{-3} k = 10^3 M = 10^6 G = 10^9