Primary Equations

\[ F_E = k \frac{|q_1 q_2|}{r^2} \quad F_M = qvB \sin(\theta) \quad \vec{F}_E = q\vec{E} \quad \Delta PE = -qE\Delta x \]

\[ V = k \frac{q}{r} \quad \Delta V = \frac{\Delta PE}{q} \quad \Delta V = -E\Delta x \quad \Delta V = IR \]

\[ I = \frac{\Delta Q}{\Delta t} \quad P = I\Delta V \quad P = I^2R \quad P = \frac{\Delta V^2}{R} \]

\[ R^{(s)}_{Total} = R_1 + R_2 + \ldots \quad \frac{1}{R^{(p)}_{Total}} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots \]

\[ \Phi_E = EA \cos(\theta) \quad \Phi_B = BA \cos(\theta) \quad \Phi_E = \frac{Q_{\text{Inside}}}{\epsilon_0} \quad B = \frac{\mu_0 I}{2\pi r} \]

\[ \mathcal{E} = -N \frac{\Delta \Phi_B}{\Delta t} \quad v = f \lambda \quad E = hf \quad n = \frac{c}{v} \]

\[ \lambda_1 n_1 = \lambda_2 n_2 \quad n_1 \sin(\theta_1) = n_2 \sin(\theta_2) \quad \frac{1}{p} + \frac{1}{q} = \frac{1}{f} \quad R = 2f \]

\[ M = \frac{h'}{h} \quad M = -\frac{q}{p} \quad \Delta t = \frac{\Delta t'}{\sqrt{1 - v^2/c^2}} \quad L = L_0\sqrt{1 - v^2/c^2} \]

\[ V_{CA} = \frac{V_{CB} + V_{BA}}{1 + \frac{V_{CB}V_{BA}}{e^2}} \quad m = \frac{m_0}{\sqrt{1 - v^2/c^2}} \quad E = mc^2 \]

\[ R = \lambda N \quad N(t) = N_0 e^{-\lambda t} \quad T_{1/2} = \frac{0.693}{\lambda} \quad 1 \text{ Bq} = 1 \text{ decay/s} \]

\[ k = 9.0 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2 \quad \epsilon_0 = \frac{1}{4\pi k} \quad \mu_0 = 4\pi \times 10^{-7} \text{ T} \cdot \text{m/A} \]

\[ c = 3.00 \times 10^8 \text{ m/s} \quad h = 6.63 \times 10^{-34} \text{ J} \cdot \text{s} \quad \text{Ci} = 3.70 \times 10^{10} \text{ Bq} \]