Numbers:

$k = \frac{1}{4\pi\varepsilon_0} = 9.0 \times 10^9 \ \frac{N \cdot m^2}{C^2}$ $m_e = 9.11 \times 10^{-31}\ kg$ $m_p = 1.67 \times 10^{-27}\ kg$

$\mu_0 = 4\pi \times 10^{-7} \frac{T \cdot m}{A}$ $c = 3.00 \times 10^8\ m/s$ $h = 6.63 \times 10^{-34}\ J \cdot s$

$e = 1.60 \times 10^{-19}\ C$ $G = 6.67 \times 10^{-11} \frac{N \cdot m^2}{kg^2}$ $g = 9.80\ m/s^2$

$R = 1.097 \times 10^7\ \mathrm{m}^{-1}$

Equations:

Geometry:

$A_{circle} = \pi R^2$ $A_{sphere} = 4\pi R^2$

$V_{sphere} = \frac{4}{3}\pi R^3$ $V_{cylinder} = \pi R^2 h$ $C_{circle} = 2\pi R$

$A_{cylinder} = 2\pi r^2 + 2\pi r h$

Mechanics:

$v = v_0 + at$ $v^2 = v_0^2 + 2a(x - x_0)$ $v = \frac{v_f + v_0}{2}$

$x = x_0 + v_0 t + \frac{1}{2}(at^2)$ $a = \frac{v^2}{r}$ $v_{ave} = \frac{d}{t}$

$F = ma$ $W = Fd$ $\mathrm{KE} = \frac{1}{2}\mathrm{mv}^2$

$PE = mgh$ $P = W/t \text{ or } E/t$

Physics this semester:

$F = k\frac{Q_1 Q_2}{r^2}$ $F = qE$ $E = k\frac{Q}{r^2}$

$PE = qV$ $\Delta V = -E_x \Delta x$ $\Delta V = Ed$

$V = k\frac{Q}{r}$ $\quad Q = CV$ $\quad C = \frac{K\varepsilon_o A}{d}$

$I = \Delta Q/\Delta t$ $\quad V = IR$ $\quad PE = \frac{1}{2}CV^2$

$R = \frac{\rho L}{A}$ $\quad P = IV = I^2R = \frac{V^2}{R}$ $\quad R_{eq} = R_1 + R_2 + \ldots$

$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$ $\quad I_{rms} = \frac{I_0}{\sqrt{2}};\quad V_{rms} = \frac{V_0}{\sqrt{2}}$ $\quad V_{term} = \varepsilon - Ir$

$V_{term} = \varepsilon\left(\frac{R}{R+r}\right)$ $\quad F = qvB\sin\theta$ $\quad F = IlB\sin\theta$

$B = \frac{\mu_0 I}{2\pi r}$ $\quad B = \frac{\mu_0 IN}{l}$ $\quad F = \frac{\mu_0 I_1 I_2 l}{2\pi d}$

$v = E/B$ $\quad \varepsilon = -N\frac{\Delta\Phi_B}{\Delta t}$ $\quad \varepsilon = Blv$

$\varepsilon = NB\omega A\sin(\omega t)$ $\quad \frac{V_S}{V_P} = \frac{N_S}{N_P}$ $\quad I_P V_P = I_S V_S$

$\Phi_E = \frac{q_{enc}}{\varepsilon_0}$ $\quad \Phi_E = \sum_{i=1}^{N} E_i \Delta A_i \cos\theta_i = \sum_{i=1}^{N} E_{i\,perp}\Delta A_i$

$\Phi_B = 0$ $\quad \Phi_B = \sum_{i=1}^{N} B_i \Delta A_i \cos\theta_i = \sum_{i=1}^{N} B_{i\,perp}\Delta A_i$

$$\sum_{i=1}^{N}\left|\vec{B}_i\right|\left|\vec{\Delta x}_i\right|\cos\theta = \sum_{i=1}^{N} B_{ix}\Delta x_i = \mu_0 I_{encl} + \mu_0\varepsilon_0\frac{\Delta\Phi_E}{\Delta t}$$

$$\sum_{i=1}^{N}\left|\vec{E}_i\right|\left|\vec{\Delta x}_i\right|\cos\theta = \sum_{i=1}^{N} E_{ix}\Delta x_i = -\frac{\Delta\Phi_B}{\Delta t}$$

$v = f\lambda$ $\quad c = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$ $\quad u = \frac{1}{2}\varepsilon_0 E^2 + \frac{1}{2}\frac{B^2}{\mu_0}$

$I = P/A$

$I_{ave} = \frac{1}{2}\varepsilon_0 c E_0^{\,2}$

$n = \frac{c}{v}$

$n_1 \sin\theta_1 = n_2 \sin\theta_2$

$f = \frac{r}{2}$

$\frac{1}{d_o} + \frac{1}{di} = \frac{1}{f}$

$m = \frac{h_i}{h_o} = -\frac{d_i}{d_o}$

$m_{ang} = \frac{\theta'}{\theta}$

$m_{ang} = \frac{N}{f}$

$m_{ang} = \frac{N}{f} + 1$

$\lambda_n = \frac{\lambda}{n}$

$d \sin\theta = m\lambda$

$D \sin\theta = m\lambda$

$E = hf$

$hf = KE_{max} + W_0$

$\lambda = \frac{h}{p}$

$L_n = mv_n r_n$

$hf = E_u - E_l$

$L_n = \frac{nh}{2\pi}$

$r_n = \frac{n^2 h^2}{4\pi^2 mke^2}$

$E_n = -\frac{2\pi^2 mk^2 e^4}{n^2 h^2}$

$\frac{1}{\lambda} = R\left(\frac{1}{n'^2} - \frac{1}{n^2}\right)$