$$k = 8.99 \times 10^9 \, \frac{N.m^2}{C^2}$$
$$\epsilon_0 = 8.85 \times 10^{-12} \, \frac{C^2}{N.m^2}$$
$$e = 1.6 \times 10^{-19} \, C$$
$$\mu_0 = 4\pi \times 10^{-7} \, H/m$$
$$c = 3.00 \times 10^8 \, m/s$$
$$k = \frac{1}{4\pi\epsilon_0}$$
$$\vec{F}_{2,1} = \frac{kq_1q_2}{r_{1,2}^2}\hat{r}_{1,2}$$
$$\vec{E} = \frac{\vec{F}}{q}$$
$$\vec{E} = \frac{kq}{r^2}\hat{r}$$
$$\vec{E} = \frac{\lambda}{2\pi\epsilon_0 r}\hat{r} = \frac{2k\lambda}{r}\hat{r}$$
$$E = \frac{\sigma}{2\epsilon_0} = 2\pi k\sigma$$
$$\Phi_E = \vec{E} \cdot \vec{A}$$
$$\Phi_E = \frac{Q_{in}}{\epsilon_0} = 4\pi k Q_{in} \text{ (for closed surface)}$$
$$V = Ed$$
$$V = \frac{kQ}{r}$$
$$\Delta PE = Q\Delta V$$
$$Q = CV$$
$$C = \epsilon_0 \frac{A}{d} \text{ (for parallel plate)}$$
$$C_{eq} = C_1 + C_2 + ...$$
$$\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2} + ...$$
$$I = nqv_dA$$
$$J = \frac{I}{A} = \sigma E$$
$$V = IR$$
$$R = \rho\frac{L}{A}$$
$$P = VI$$
$$R_{eq} = R_1 + R_2 + ...$$
$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + ...$$
$$\vec{F} = q\vec{v} \times \vec{B}$$
$$\vec{F} = I\vec{l} \times \vec{B}$$
$$f = \frac{qB}{2\pi m}$$
$$\vec{B} = \frac{\mu_0}{4\pi} q \frac{\vec{v} \times \hat{r}}{r^2}$$
$$\vec{B} = \frac{\mu_0}{4\pi} I \frac{\vec{\Delta l} \times \hat{r}}{r^2}$$
$$B = \frac{\mu_0 I}{2R}$$
$$B = \frac{\mu_0 I}{2\pi R}$$
$$B = \mu_0 n I$$
$$\frac{F}{l} = \frac{\mu_0 I_1 I_2}{2\pi r}$$
$$\Phi_B = \vec{B} \cdot \vec{A}$$
$$\mathcal{E} = -N\,\frac{\Delta\phi_B}{\Delta t}$$
$$\mathcal{E} = vBl$$
$$L = \mu_0 n^2 A l$$
$$c = f\lambda$$
$$E = cB$$
$$I = \frac{P}{A}$$
$$I = \frac{E_0B_0}{2\mu_0}$$
$$\theta_i = \theta_r$$
$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$
$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}$$
$$f = \frac{R}{2}$$
$$M = -\frac{d_i}{d_o}$$
$$\frac{1}{f} = (n-1)\left(\frac{1}{R_1} + \frac{1}{R_2}\right)$$
$$P = \frac{1}{f}$$
$$v = \frac{c}{n}$$
$$\lambda = \frac{\lambda_0}{n}$$
$$d\sin\theta = m\lambda$$
$$d\frac{y}{L} = m\lambda$$
$$2t = \left(m + \frac{1}{2}\right)\frac{\lambda_0}{n}$$
$$2t = m\frac{\lambda_0}{n}$$
$$D\sin\theta = m\lambda$$
$$D\frac{y}{L} = m\lambda$$
$$I = I_0\cos^2\theta$$
$$\tan\theta_P = \frac{n_2}{n_1}$$