

Equation Sheet Test 3, PHYS 1112

$$f \cdot \lambda = c, f' = f(1 \pm v/c), \Theta_r = \Theta_i, \frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}, m = \frac{h_i}{h_o} = \frac{-d_i}{d_o}, v = c/n, n_1 \sin \Theta_1 = n_2 \sin \Theta_2, n_1 \sin \Theta_c = n_2 \sin 90^\circ = n_2, M = \frac{\Theta'}{\Theta}$$

$$d \sin(\Theta) = m\lambda, d \sin(\Theta) = (m \pm 1/2)\lambda, \text{ or:}$$

$$I = I_1 + I_2 + 2E_1 E_2 \cos\left(\frac{2\pi}{\lambda} \Delta l + \Delta \Phi\right)$$

$$W \sin(\Theta) = m\lambda$$

$$\sin(\Theta) = 1.22\lambda/d$$

$$\vec{F}_{12} = k \frac{q_1 q_2}{r_{12}^2} \hat{r}_{12} = q_2 \cdot \vec{E}_1,$$

$$\vec{E} = k \frac{q}{r^2} \hat{r}$$

$$k = 8.99 \times 10^9 \text{ N} \cdot \text{m}^2 / \text{C}^2, e = 1.6 \times 10^{-19} \text{ C}, \epsilon_0 = \frac{1}{4\pi k}$$

$$\Phi = \vec{E} \vec{A} = E \cdot A \cos(\Theta)$$

$$\Phi_t = Q_{encl} / \epsilon_0 \text{ (for closed surface)}$$

$$\Delta V = \Delta U / q_0 = -\vec{E} \Delta \vec{s}$$

$$V = k \frac{q}{r}, U = V q_0$$

$$C = Q/V, C = \frac{\epsilon_0 A}{d}$$

$$V = R \cdot I$$

$$R_{eq} = R_1 + R_2 + R_3 + \dots$$

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$$

$$F = q \cdot v \cdot B \cdot \sin(\Theta)$$

$$F = I \cdot L \cdot B \cdot \sin(\Theta)$$

$$B = \mu_0 \frac{I}{2\pi r}, \mu_0 = 4\pi \cdot 10^{-7} \text{ T} \cdot \text{m/A}$$

$$\Phi = BA \cos \Theta$$

$$EMF = -N \frac{\Delta \Phi}{\Delta T}$$

$$EMF = Bvl$$