

Physics 210 Formula Sheet

$$Y = \frac{F/A}{\Delta L/L_o}$$

$$S = \frac{F/A}{\Delta x/h}$$

$$B = - \frac{F/A}{\Delta V/V_o}$$

$$\rho = \frac{m}{V}$$

$$P = \frac{dF}{dA}$$

$$P_b = P_t + \rho g h$$

$$B = \rho_f V_d g$$

$$A_1 v_1 = A_2 v_2$$

$$P_1 + \frac{\rho v_1^2}{2} + \rho g y_1 = P_2 + \frac{\rho v_2^2}{2} + \rho g y_2$$

$$v = \frac{dx}{dt} \text{ (phase velocity)}$$

$$v = \sqrt{\frac{T}{\mu}}$$

$$y = A \sin (k x - \omega t - \phi)$$

$$v = \lambda f$$

$$k = \frac{2\pi}{\lambda}$$

$$\omega = 2\pi f$$

$$\frac{\partial^2 y}{\partial x^2} = \frac{1}{v^2} \frac{\partial^2 y}{\partial t^2}$$

$$v = \sqrt{\frac{B}{\rho}}$$

$$\Delta P = P_m \sin (k x - \omega t)$$

$$P_m = \rho v \omega s_m$$

$$I = \frac{\text{power}}{\text{area}}$$

$$\beta = 10 \log \left(\frac{I}{I_o} \right)$$

$$I_o = 1 \times 10^{-12} \frac{W}{m^2}$$

$$f_o = f_s \left(\frac{v \pm v_o}{v \pm v_s} \right)$$

$$y = 2 A_o \sin (k x) \cos (\omega t)$$

$$f_b = |f_1 - f_2|$$

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

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

$$m = - \frac{i}{o} = \frac{h_i}{h_o}$$

$$\frac{1}{o} + \frac{1}{i} = \frac{1}{f}$$

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

$$\frac{n_1}{o} + \frac{n_2}{i} = \frac{n_2 - n_1}{R}$$

$$\frac{1}{f} = (n - 1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$$

$$d \sin \theta = m \lambda$$

$$d \sin \theta = \left(m + \frac{1}{2} \right) \lambda$$

$$I_{av} = I_o \cos^2 \left(\frac{\pi d \sin \theta}{\lambda} \right)$$

$$2 t = \left(m + \frac{1}{2} \right) \lambda_n$$

$$2 t = m \lambda_n$$

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

$$a \sin \theta = m \lambda$$

$$I_\theta = I_o \left[\frac{\sin \left(\frac{\pi a \sin \theta}{\lambda} \right)}{\frac{\pi a \sin \theta}{\lambda}} \right]^2$$

$$\theta_m = 1.22 \frac{\lambda}{D}$$

$$R = \frac{\lambda}{\Delta \lambda} = N m$$

$$I_2 = I_1 \cos^2 \theta$$