Formula Sheet – PHYS 375 Final Exam

$$\bar{x} = \frac{\sum_i x_i}{N}, \quad \sigma = \sqrt{\frac{\sum_i (x_i - \bar{x})^2}{N-1}}, \quad \sigma_{\bar{x}} = \frac{\sigma}{\sqrt{N}}$$

$$\Delta f = \sqrt{\left(\frac{\partial f}{\partial x}\Delta x\right)^2 + \left(\frac{\partial f}{\partial y}\Delta y\right)^2 + \dots}$$

$$n_1 \sin(\theta_1) = n_2 \sin(\theta_2), \quad \sin(\theta_c) = \frac{n_2}{n_1}$$

$$\frac{1}{s} + \frac{1}{s'} = \frac{1}{f}$$

$$\left\langle \left|\vec{S}\right| \right\rangle = I \sim \left|\vec{E}_0^2\right|$$

$$I = I_0 \cos^2(\theta)$$

$$\tan(\theta_B) = \frac{n_2}{n_1}$$

$$\Delta m = \frac{2(x_2 - x_1)}{\lambda}, \quad \Delta\lambda \approx \frac{\lambda^2}{2\Delta d}$$

$$I = I_0 \cos^2\left(\frac{\Delta\phi}{2}\right)$$

$$I = I_0 \frac{\sin^2(\beta)}{\beta^2}, \quad \beta = \frac{1}{2}kb\sin(\theta)$$

$$I = I_0 \frac{\sin^2(\beta)}{\beta^2}\cos^2(\alpha), \quad \alpha = \frac{1}{2}ka\sin(\theta)$$

$$I = I_0 \frac{\sin^2(\beta)}{\beta^2}\left(\frac{\sin(N\alpha)}{\sin(\alpha)}\right)^2$$

$$a\sin(\theta) = n\lambda$$

$$\Delta E = -13.6eV\left(\frac{1}{n^2} - \frac{1}{n'^2}\right)$$

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