PHYS 1312 Fall 2016 Test 1
Equation Sheet

$$v = f\lambda \qquad \omega = 2\pi f \qquad f = 1/T \qquad v_{\text{sound}} = \Big(\frac{\gamma k_B T}{m}\Big)^{1/2} \tag{1}$$

$$y(x,t) = A\sin(kx \mp \omega t + \phi_0) = A\sin\varphi \qquad k = 2\pi/\lambda \tag{2}$$

$$\Delta\varphi = \frac{2\pi}{\lambda}\Delta x + \Delta\phi_0 = m2\pi \qquad f_o = f_s\Big(\frac{1 \pm v_0/v}{1 \mp v_s/v}\Big) \tag{3}$$

$$f_n^{oo} = n\frac{v}{2L} \qquad f_n^{oc} = n\frac{v}{4L} \tag{4}$$

$$n = \frac{c}{\text{v}} \qquad n_1\sin\theta_1 = n_2\sin\theta_2 \tag{5}$$

$$\frac{1}{p} + \frac{1}{q} = \frac{1}{f} \qquad \frac{n_1}{p} + \frac{n_2}{q} = \frac{n_2 - n_1}{R} \qquad \frac{1}{f} = (n-1)\Big(\frac{1}{R_1} - \frac{1}{R_2}\Big) \tag{6}$$

$$f = \frac{R}{2} \qquad M = \frac{h'}{h} = \frac{-q}{p} \qquad I \propto \frac{D^2}{f^2} \tag{7}$$

$$f\text{−number} = f/D \qquad P = \frac{1}{f} \qquad m = \frac{\theta}{\theta_0} \qquad m_{\max} = 1 + \frac{25\text{ cm}}{f} \tag{8}$$

$$M_0 = \frac{-L}{f_0} \qquad M = M_0 m_e = -\frac{L}{f_0}\frac{25\text{ cm}}{f_e} \qquad m = -\frac{f_0}{f_e} \tag{9}$$

Math relations and constants

$$\sin(A \pm B) = \sin A\cos B \pm \cos A\sin B \tag{10}$$

$$\cos(A \pm B) = \cos A\cos B \mp \sin A\sin B \tag{11}$$

$$\text{Circumference} = 2\pi r \qquad A = \pi r^2 \qquad V = \frac{4}{3}\pi r^3 \tag{12}$$

$$c = 3\times10^8\text{ m/s} \quad k_e = 8.99\times10^9\text{ Nm}^2/\text{C}^2 \quad \epsilon_0 = 8.854\times10^{-12}\text{ C}^2/(\text{Nm}^2) \tag{13}$$

$$e = 1.602\times10^{-19}\text{ C} \quad m_e = 9.11\times10^{-31}\text{ kg} \quad k_B = 1.38\times10^{-23}\text{J/K} \tag{14}$$