

Formula Sheet For PH 211 Midterm I

$$v_x = v \cos \theta$$

$$v_y = v \sin \theta$$

$$v = \sqrt{v_x^2 + v_y^2}$$

$$\theta = \tan^{-1}\left(\frac{v_y}{v_x}\right)$$

$$\vec{v}_{avg} = \frac{\Delta \vec{r}}{\Delta t}$$

$$\vec{a}_{avg} = \frac{\Delta \vec{v}}{\Delta t}$$

$$\vec{v} = \frac{d\vec{r}}{dt}$$

$$\vec{a} = \frac{d\vec{v}}{dt}$$

$$g = 9.80 \text{ m/sec}^2$$

$$\vec{s}_f = \vec{s}_i + \vec{v}_{is}t + \frac{1}{2}\vec{a}_s t^2$$

$$\vec{v}_{fs} = \vec{v}_{is} + \vec{a}_s t$$

$$v_{fs}^2 = v_{is}^2 \pm 2a_s \Delta s$$

$$\omega = \frac{d\theta}{dt}$$

$$v_t = \omega r$$

$$a_c = \frac{v^2}{r} = \omega^2 r$$

$$T = \frac{2\pi r}{v} = \frac{2\pi}{\omega}$$

$$t_1 = \sqrt{\frac{2h}{g}}$$

$$R_1 = v_o \sqrt{\frac{2h}{g}}$$

$$t_2 = \frac{2v_o \sin \theta}{g}$$

$$R_2 = \frac{v_o^2 \sin 2\theta}{g}$$

$$h_2 = \frac{v_o^2 \sin^2 \theta}{2g}$$

$$\vec{F}_{net} = \Sigma \vec{F} = 0$$

$$\vec{F}_{net} = \Sigma \vec{F} = m\vec{a}$$

$$a = g \sin \theta$$

$$v = \sqrt{2gh}$$