PHYS 204 - Mechanics
Final Exam – Formula Sheet

$$\vec{r}_f = \vec{r}_i + \vec{v}t$$
$$\vec{v}_f = \vec{v}_i + \vec{a}t$$
$$\vec{r}_f = \vec{r}_i + \vec{v}_i t + \frac{1}{2}\vec{a}t^2$$
$$v_f^2 - v_i^2 = 2a\Delta r$$
$$v_{avg} = \frac{v_1 + v_2}{2}$$
$$\theta_f = \theta_i + \omega t$$
$$\omega_f = \omega_i + \alpha t$$
$$\theta_f = \theta_i + \omega_i t + \frac{1}{2}\alpha t^2$$
$$\omega_f^2 - \omega_i^2 = 2\alpha\Delta\theta$$
$$\omega_{avg} = \frac{\omega_1 + \omega_2}{2}$$
$$h = \frac{v_i^2 \sin^2\theta}{2g}$$
$$R = \frac{v_i^2 \sin(2\theta)}{g}$$
$$\sum \vec{F} = m\vec{a}$$
$$f = \mu n$$
$$\vec{P} = m\vec{v}$$
$$\vec{I} = \sum \vec{F}_{avg}\,\Delta t = \Delta\vec{P}$$
$$W = \vec{F}.\Delta\vec{r}$$
$$W = \vec{\tau}.\Delta\vec{\theta}$$
$$\vec{A}\cdot\vec{B} = |\vec{A}||\vec{B}|cos\theta$$
$$|\vec{A}\times\vec{B}| = |\vec{A}||\vec{B}|sin\theta$$
$$I = \sum m_i r_i^2$$
$$\vec{L} = m\vec{r}\times\vec{v}$$
$$\vec{L} = I\vec{\omega}$$
$$\vec{\tau} = \vec{r}\times\vec{F}$$
$$\sum \vec{\tau} = I\vec{\alpha}$$
$$K = \frac{1}{2}mv^2$$
$$U_g = mgy$$
$$U_s = \frac{1}{2}kx^2$$
$$\vec{F}_{Spring} = -k\Delta\vec{x}$$
$$K_R = \frac{1}{2}I\omega^2$$
$$v = r\omega$$
$$a = r\alpha$$
$$a_c = \frac{v^2}{r}$$
$$g = 10\ m/s^2$$
$$T = 2\pi\sqrt{\frac{m}{k}}$$
$$\omega = 2\pi f = \frac{2\pi}{T}$$
$$x(t) = A\cos(\omega t + \phi)$$
$$v(t) = -\omega A\sin(\omega t + \phi)$$
$$a(t) = -\omega^2 A\cos(\omega t + \phi)$$