Physics 2305 24 March, 2000
Equation Sheet for Exam 2

Quadratic formula: $x(y=0) = (-b/2a) \pm (b^2-4ac)^{1/2}/(2a)$
$\mathbf{a}\bullet\mathbf{b} = ab\cos\theta = a_x b_x + a_y b_y + a_z b_z$
$\mathbf{a} \times \mathbf{b} = ab\sin\theta$
$g = 9.80\ m/s^2$

$R = (v_o^2/g)\sin 2\theta_o$

$f = \mu N$
$\mathbf{F_g} = -m\mathbf{g}$ $\quad U = mgy$
$\mathbf{F_s} = -k\mathbf{d}$ $\quad U = (\frac{1}{2})\,kx^2$
$W = \int \mathbf{F}(r)\bullet d\mathbf{r}$ $\quad W = \Delta U$
$P = dW/dt$

$\mathbf{r}_{cm} = \sum m_i \mathbf{r}_i \ / \sum m_i$
$\mathbf{v}_{cm} = \sum m_i \mathbf{v}_i \ / \sum m_i$
$v_{1f} = v_{1i}\,(m_1 - m_2)/(m_1 + m_2) + v_{2i}\,2m_2/(m_1 + m_2)$
$v_{2f} = v_{1i}\,2m_1/(m_1 + m_2) + v_{2i}\,(m_2 - m_1)/(m_1 + m_2)$

$v = at + v_o$ $\quad \omega = \alpha t + \omega_o$ $\quad v = \omega r$
$x = (\frac{1}{2})\,at^2 + v_o t + x_o$ $\quad \theta = (\frac{1}{2})\,\alpha t^2 + \omega_o t + \theta_o$ $\quad s = \theta r$
$v^2 = v_o^2 + 2a(x-x_o)$ $\quad \omega^2 = \omega_o^2 + 2\alpha(\theta-\theta_o)$ $\quad a_t = \alpha r$
$a_r = v^2/r = \omega^2 r$

$K = (\frac{1}{2})\,mv^2$ $\quad K = (\frac{1}{2})\,I\omega^2$
$\sum F = ma$ $\quad \sum \tau = I\alpha$
$\sum \mathbf{F} = d\mathbf{p}/dt$ $\quad \sum \tau = d\mathbf{l}/dt$
$W = \int \mathbf{F}\bullet d\mathbf{x}$ $\quad W = \int \tau\, d\theta$
$P = \mathbf{F}\bullet\mathbf{v}$ $\quad P = \tau\bullet\omega$
$\mathbf{p} = m\mathbf{v}$ $\quad L = I\omega$

$\mathbf{l} = \mathbf{r} \times \mathbf{p}$ $\quad \tau = \mathbf{r} \times \mathbf{F}$
$I = \sum m_i r_i^2$ $\quad I = I_{cm} + Mh^2$

$T = 2\pi/\omega$ $\quad \omega = 2\pi f$