Physics 2305 21 April, 2000
Equation Sheet for Exam 3

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

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

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

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

$K = (\frac{1}{2})\, mv^2$ | $K = (\frac{1}{2})\, I\omega^2$ | $I = \sum m_i r_i^2$ | $I = I_{cm} + Mh^2$
$\sum F = ma$ | $\sum \tau = I\alpha$ | $\tau = \mathbf{r} \times \mathbf{F}$ | $\mathbf{l} = \mathbf{r} \times \mathbf{p}$
$\sum \mathbf{F} = d\mathbf{p}/dt$ | $\sum \tau = d\mathbf{l}/dt$
$W = \int \mathbf{F}\bullet d\mathbf{x}$ | $W = \int \tau\, d\theta$
$P = \mathbf{F}\bullet\mathbf{v}$ | $P = \tau\bullet\omega$
$\mathbf{p} = m\mathbf{v}$ | $L = I\omega$

$T = 2\pi/\omega = 1/f$ | $T = 2\pi\,(m/k)^{1/2}$ | $T = 2\pi\,(I/\kappa)^{1/2}$
| $T = 2\pi\,(L/g)^{1/2}$ | $T = 2\pi\,(I/mgh)^{1/2}$

$F = G\, m_1 m_2/r^2$ | $p = F/A$
$U = -G\, m_1 m_2/r$ | $p_2 = p_1 + \rho\, g\, \Delta y$
$v_e = (2GM/R)^{1/2}$ | $R = \Delta V/\Delta t = Av$ = constant
$T^2 = (4\pi^2/GM)\, a^3$ | $p + \frac{1}{2}\rho v^2 + \rho g y$ = constant

$T_F = (9/5)\, T_C + 32°$ | $\Delta L = L\, \alpha\, \Delta T$ | $H = Q/t = (A/\Sigma R)\, \Delta T$
$Q = c\, m\, \Delta T$ | $\Delta V = V\, \beta\, \Delta T$ | $R = L/k$
$Q = L\, m$ | $\beta = 3\, \alpha$ | $P = A\varepsilon\sigma T^4$

$g = 9.80$ m/s^2 | $\sigma = 5.67 \times 10^{-8}$ W K^{-4}
$G = 6.67 \times 10^{-11}$ N m^2 kg^{-2}
$c = 2.998 \times 10^8$ m/s

1 year $= 3.156 \times 10^7$ s $= 365.25$ d
1 AU $= 1.496 \times 10^{11}$ m
1 $M_\odot = 1.99 \times 10^{30}$ kg