EQUATIONS AND CONSTANTS

ANGLES:	$Sin\ 53^\circ = Cos\ 37^\circ = 0.8$	$Sin\ 37^\circ = Cos\ 53^\circ = 0.6$	
CONVERSIONS:	12 in = 1 ft = 0.305 m	1.00 lb = 4.448 N	
GEOMETRY:	$A_{sphere} = 4\pi r^2$	$V_{sphere} = \frac{4}{3}\pi r^3$	
GRAVITY:	$g = 9.8\ \mathrm{m/s^2}$ $F_G = mg$	$G = 6.67 \times 10^{-11}\ \mathrm{N{\cdot}m^2/kg^2}$ $g(r) = GM/r^2$	
SYSTEMS OF PARTICLES:	$\vec{\mathbf{p}}_{sys} = M_{sys}\ \vec{\mathbf{v}}_{CM}$	$\Sigma\vec{\mathbf{F}}_{ext} = M_{sys}\ \vec{\mathbf{a}}_{CM}$	
KINEMATICS:	$\Delta x = v_{ix}(\Delta t) + \frac{1}{2}a_x(\Delta t)^2$	$v_{fx}^2 - v_{ix}^2 = 2a_x\Delta x$	$a_c = v^2/r$
ENERGY AND MOMENTUM:	$\Sigma W = \Delta K$	$\Delta U_G = mg\Delta h$	$\vec{\mathbf{I}} = \Delta\vec{\mathbf{p}}$
ROTATIONAL MOTION:	$v_t = r\omega$ $\Delta\theta = \omega_i(\Delta t) + \frac{1}{2}\alpha(\Delta t)^2$ $\Sigma\tau_{\mathrm{O}} = I_{\mathrm{O}}\alpha$ $K_{rot,\mathrm{O}} = \frac{1}{2}I_{\mathrm{O}}\omega^2$ $\overline{\Sigma\tau_{\mathrm{O}}} = \Delta L_{\mathrm{O}}/\Delta t$	$a_t = r\alpha$ $\omega_f^2 - \omega_i^2 = 2\alpha\Delta\theta$ $W_\tau = \tau\Delta\theta$ $K_{sys} = \frac{1}{2}Mv_{CM}^2 + \frac{1}{2}I_{CM}\omega^2$ $L_{\mathrm{O}} = I_{\mathrm{O}}\omega$	
ELASTICITY :	$U_S = \frac{1}{2}kx^2$	$\omega^2 = \frac{k}{m}$	$\omega^2 = \frac{g}{\ell}$
	$x(t) = A\cos(\omega t)$	$v_x(t) = -\omega A\sin(\omega t)$	$a_x(t) = -\omega^2 A\cos(\omega t)$
FLUIDS AND WAVES:	$\rho_{water} = 1000\ \mathrm{kg/m^3}$ $P(d) = P_{top} + \rho gd$	1 atm = 101,300 Pa = 760 mmHg $P + \rho gh + \frac{1}{2}\rho v^2 = \text{constant}$ $f = f_0\left(1 \pm \frac{v_D}{v_w}\right) / \left(1 \mp \frac{v_S}{v_w}\right)$	