

**Formulas**  
(you need very few of these!!)

$x = x_0 + v_0t + \frac{1}{2}a_x t^2$	$D = \frac{1}{2}C\rho Av^2$	$W = \int_{\vec{x}_i}^{\vec{x}_f} \vec{F}(x) \cdot d\vec{x}$	$W = \vec{F} \cdot \vec{x}$	
$\vec{A} \cdot \vec{B} =  \vec{A}  \vec{B} \cos\theta$	$\vec{a} \times \vec{b} =  \vec{a}  \vec{b} \sin\phi \perp$ to both		$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	
$\sin\theta = \frac{o}{h}$	$\cos\theta = \frac{a}{h}$	$\tan\theta = \frac{o}{a}$		
$\vec{r} = \vec{r}_0 + \vec{v}_0t + \frac{1}{2}\vec{a}t^2$	$\vec{v} = \vec{v}_0 + \vec{a}t$	$\vec{v}^2 = \vec{v}_0^2 + 2\vec{a}(\vec{r} - \vec{r}_0)$		
$y = (\tan\theta)x - \frac{gx^2}{2(v_0 \cos\theta_0)^2}$		$a_r = \frac{v_t^2}{r}$	$R = \frac{v^2}{g}\sin(2\theta)$	
$\sum \vec{F} = m\vec{a}$	$f_s = \mu_s N, f_k = \mu_k N$		$F_s = -kx$	
$U_g = mgh$	$W_s = -\frac{1}{2}kx^2$	$KE = \frac{1}{2}mv^2$	$P = \frac{dW}{dt}$	
$\sin 30^\circ = 0.5 = \cos 60^\circ, \cos 30^\circ = 0.866 = \sin 60^\circ$		$\sin 45^\circ = 0.707 = \cos 45^\circ$		
use $g = 10 \frac{m}{\text{sec}^2}$ ,	$\tan 45^\circ = 1$	$\tan 30^\circ \approx 0.5$		
$C = 2\pi r$	$A = \pi r^2$	$V = \frac{4}{3}\pi r^3$	$A_{\text{sphere}} = 4\pi r^2$	$A_{\text{cylinder}} = 2\pi r h$
$v = \frac{dx}{dt}$	$a = \frac{dv}{dt}$	$T = \frac{2\pi}{\omega}$		