Possibly useful relations:

$\vec{A} = A_x\hat{i} + A_y\hat{j} + A_z\hat{k}$	$\lvert\vec{A}\rvert = \sqrt{A_x^2 + A_y^2 + A_z^2}$
$\cos\theta = $ adjacent/hypotenuse	$\tan\theta = \sin\theta / \cos\theta$
$\sin\theta = $ opposite/hypotenuse	$x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$\vec{v}_{\text{avg}} = \Delta\vec{r}/\Delta t$	$\vec{v}(t) = \frac{d\vec{r}}{dt}$
$\vec{a}_{\text{avg}} = \Delta\vec{v}/\Delta t$	$\vec{a}(t) = \frac{d\vec{v}}{dt}$
$\vec{v_f} = \vec{v_i} + \vec{a}t$	$v_{\text{avg}} = \frac{v_i+v_f}{2}$
$x_f = x_i + v_i t + \frac{1}{2}at^2$	$\vec{r}_f = \vec{r}_i + \vec{v_i}t + \frac{1}{2}\vec{a}t^2$
$x_f = x_i + v_{\text{avg}}t$	$v_f^2 = v_i^2 + 2a\Delta x$
$\vec{v}_{AB} = \vec{v}_{AC} + \vec{v}_{CB}$	

$\Sigma\vec{F} = m\vec{a}$	$\vec{F}_{AB} = -\vec{F}_{BA}$
$\vec{F}_g = \vec{W} = m\vec{g}$	$\vec{F}_{12} = G\frac{m_1 m_2}{r_{12}^2}\hat{r}_{12} = -\vec{F}_{21}$
$f_s \leq \mu_s N,\ f_K = \mu_K N$	$F_D = \frac{1}{2}C\rho A v^2$
$a_c = \frac{v^2}{r} = \omega^2 r$	$v = \frac{2\pi}{T}r = \omega r$

$dW = \vec{F}\cdot d\vec{r} = \lvert\vec{F}\rvert\lvert d\vec{r}\rvert\cos\theta$	$W_{AB} = \int_A^B \vec{F}\cdot d\vec{r}$
$E = K + U$	$K = m\frac{v^2}{2},\ \Delta K = W_{net}$
$U_g = mgy,\ U(r) = -G\frac{mM}{r}$	$U_s(x) = k\frac{(x-x_0)^2}{2}$
$\Delta E = W_{non\ cons}$	$P = \frac{dW}{dt},\ P = \vec{F}\cdot\vec{v}$

$\vec{P} = \Sigma_i m_i \vec{v}_i$	$\frac{d\vec{P}}{dt} = \vec{F}_{ext},\ \Delta\vec{P} = \vec{J} = \int_{t_1}^{t_2}\vec{F}_{ext}dt$

Is energy conserved?

yes $\rightarrow$ elastic interaction	no $\rightarrow$ inelastic interaction

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$G = 6.67\times10^{-11}\frac{N\ m^2}{kg^2}$	use g=10 m/s^2 instead of 9.8 m/s^2