Kinematic Equations
$v = v_0 + at$
$x = x_0 + v_0 t + \frac{1}{2}at^2$
$v^2 = v_0^2 + 2a(x - x_0)$
$\overline{v} = \frac{v+v_0}{2}$

Force Equations
$\Sigma F = ma$
$F_g = mg$
$F_{fr} = \mu_k F_N$
On slope:
$F_{gy} = mgcos\theta$
$F_{gx} = mgsin\theta$

Work Equations
$W = Fdcos\theta$, (F is constant)
$K_E = \frac{1}{2}mv^2$
$P_E = mgh$
$W = \Delta K$ or $W = \Delta P$
$F = kx$ (Hooke's Law)
$W_{spring} = -\frac{1}{2}kx^2$

Uniform Circular Motion
$a_c = a_r$
$a_r = \frac{v^2}{r}$
$v = \frac{2\pi r}{T}$
$F_r = \frac{mv^2}{r}$
$T = \frac{1}{f}$

Momentum Equations
$\vec{p} = m\vec{v}$
$\vec{J} = \Delta\vec{p}$
$\vec{J} = \int_{t_i}^{t_f} F dx$

Units
$1\,J = 1\,Nm$
$1\,N = 1\,\frac{kg\,m}{s^2}$

Chapter 9
Conservation of...
Momentum: $m_A v_A + m_B v_B = m_A v'_A + m_B v'_B$
Energy: $\frac{1}{2}m_A v_A^2 + \frac{1}{2}m_B v_B^2 = \frac{1}{2}m_A v_A^{2'} + \frac{1}{2}m_B v_B^{2'}$
$v_A - v_B = -(v'_A - v'_B)$
— ^^^ Valid for elastic collisions only ^^^ —
$x_c m = \frac{m_A x_A + m_B x_B}{m_A + m_B}$