PROJECTILES LAUNCHED AT AN ANGLE *These equations assume that air resistance is negligible. On Earth's surface, $a_y = -g = -9.81\ m/s^2$.*	$v_x = v_i \cos\theta = \text{constant}$ $\Delta x = (v_i \cos\theta)\Delta t$ $v_{y,f} = v_i \sin\theta + a_y \Delta t$ $v_{y,f}{}^2 = v_i^2 (\sin\theta)^2 + 2a_y \Delta y$ $\Delta y = (v_i \sin\theta)\Delta t + \frac{1}{2} a_y (\Delta t)^2$
RELATIVE VELOCITY	$\mathbf{v_{ac}} = \mathbf{v_{ab}} + \mathbf{v_{bc}}$

Chapter 4 Forces and the Laws of Motion

NEWTON'S FIRST LAW	An object at rest remains at rest, and an object in motion continues in motion with constant velocity (that is, constant speed in a straight line) unless the object experiences a net external force.
NEWTON'S SECOND LAW *$\sum \mathbf{F}$ is the vector sum of all external forces acting on the object.*	$\sum \mathbf{F} = m\mathbf{a}$
NEWTON'S THIRD LAW	If two objects interact, the magnitude of the force exerted on object 1 by object 2 is equal to the magnitude of the force exerted on object 2 by object 1, and these two forces are opposite in direction.
WEIGHT *On Earth's surface, $a_g = g = 9.81\ m/s^2$.*	$F_g = ma_g$
COEFFICIENT OF STATIC FRICTION	$\mu_s = \frac{F_{s,max}}{F_n}$
COEFFICIENT OF KINETIC FRICTION *The coefficient of kinetic friction varies with speed, but we neglect any such variations here.*	$\mu_k = \frac{F_k}{F_n}$
FORCE OF FRICTION	$F_f = \mu F_n$