DIMENSIONS AND UNITS
+ check dimensional consistency in an equation
+ know SI units and SI prefixes
+ convert units

VECTORS
+ multiply a vector by a scalar
+ add/subtract vectors geometrically
+ add/subtract vectors algebraically (in terms of components and unit vectors)
+ get components of a vector (algebraic info) from magnitude and direction (geometric info)
+ get magnitude and direction (geometric info) from components of a vector (algebraic info)
+ take dot product of two vectors in terms of magnitude and direction (geometric definition), or in terms of components (algebraic definition)
+ determine the angle between two vectors using dot product
+ take cross product of two vectors in terms of magnitude and direction (geometric definition), or in terms of components (algebraic definition)
+ determine direction of cross product using the right hand rule

KINEMATICS
+ definitions of kinematic quantities (position, displacement, avg velocity, instantaneous velocity, avg acceleration, instantaneous acceleration)
+ calculate and/or determine from a graph: distance traveled, avg vs instantaneous velocity, avg vs instantaneous acceleration
+ interpret position-vs-time, velocity-vs-time, and acceleration-vs-time graphs; given one, obtain the others
+ use calculus to move back and forth between position, velocity, and acceleration as functions of time; given one, obtain the others
+ use 1D kinematics equations to solve word problems (when acceleration is: zero, constant, or non-constant)
+ identify different phases of motion in a problem
+ solve projectile motion problems
+ solve relative motion problems (1D and 2D, velocity and/or acceleration)
+ qualitatively determine direction of velocity and acceleration in curvilinear motion; quantitatively calculate magnitude of radial and tangential acceleration

FORCES
+ identify Newton's first, second, and third laws
+ distinguish contact vs non-contact forces
+ determine direction of net force from knowledge of motion, and vice versa
+ identify third law pairs between bodies
+ draw free-body diagrams with appropriate labels
+ apply Newton's second law to problems, symbolically
+ rank magnitudes of forces along a given direction
+ solve systems of equations symbolically (2nd law equations, plus constraints, plus third law relationships)
+ determine the direction and magnitude of static or kinetic friction
- solve force problems involving kinetic or static friction
- solve force problems involving circular motion
- solve force problems involving air resistance or fluid resistance (low speed, high speed)
- calculate terminal velocity for a falling object in the presence of fluid resistance