Q1T4 Review

Old material:

- All of the material from the previous tests especially:
- metric prefixes
- unit conversion
- motion

  $\boxed{d_f = d_i + v_i t + \frac{1}{2} a t^2}$ $\boxed{v_f = v_i + at}$
- Newton's Second Law of motion

  $\boxed{\Sigma \mathbf{F} = \mathbf{F}_{NET} = m\mathbf{a}}$

  The net force acting on an object produces an acceleration that is in the direction of the net force and that is proportional to the net force and **inversely** proportional to the object's mass.
- Newton's first law of motion:

  If the net force acting on an object is zero, so is the object's acceleration. This means that the object's velocity is constant.

New material

- Gravity: the acceleration due to gravity is "*g*, down".
- When an object falls vertically from rest under the influence of gravity alone (free fall) the distance it falls is given by $\boxed{d_y = \frac{1}{2} g t^2}$
- The weight of an object is given by $\boxed{F_w = mg}$
- Newton's Third Law of Motion:

  When one object exerts a force on another object, the second object exerts an equal magnitude force in the opposite direction on the first.
- Newton's First and Second Laws refer to forces acting on a single object.
- Newton's Third Law refers to forces acting between different objects.
- Action/reaction force pairs are the same as "Third Law companion forces".
- Remember that **the Earth** exerts gravitational forces on object on the Earth and, as a result, each object exerts a gravitational force **on the Earth** equal to its own weight.
- Momentum: The momentum of an object is calculated by multiplying its mass times its velocity. $\boxed{\mathbf{p} = m\mathbf{v}}$
- Because velocity has direction (It is a vector.) and mass does not (It is a scalar.), momentum has direction (It is a vector.) The direction of momentum is the same as the direction of the object's velocity.
- Force causes acceleration and acceleration results in a velocity change. For an object whose mass is not changing, this results in a momentum change. As a result, a simple formula relates force, time and momentum change:

  $\boxed{\mathbf{F}t = \Delta(m\mathbf{v})}$. The Greek letter delta (Δ) means *difference* or *change in*.
- Change in momentum is given the name: ***impulse***,
- Make sure you can solve **ALL** the homework problems.