1-Dimensional motion study sheet

Look at powerpoint notes and example problems and homework from class

* Definitions:
  + Distance- total length of path taken (scalar)
  + Displacement- straight line length from start to finish with a direction (vector)
  + Speed- distance traveled divided by time taken (scalar)
    - Equation for both speed and velocity: v = s / t (not on reference table)
  + Velocity- change in displacement per time taken (vector)
  + Acceleration- change in velocity per time (vector)
    - Equation: a = v / t (not on reference table)
    - Acceleration due to gravity 9.81 m/s2 down
* Equations on reference table ( s = distance or displacement, u = initial speed or velocity, v = final speed or velocity, t = time, a = acceleration)
  + s = (v + u ) t / 2
  + v = u + at
  + s = ut + ½ at2
  + v2 = u2 + 2as
  + acceleration must be uniform (constant) when using these equations
  + When dropping an object, u = 0 and a = 9.81 m/s2
  + When throwing an object upwards, v = 0 and a = - 9.81 m/s2
* Graphs
  + Displacement vs Time graphs
    - Slope = velocity of object
      * Positive slope-moving in + direction
      * Negative slope-moving in - direction
      * Constant slope- constant velocity
      * Changing slope- changing velocity (acceleration)
      * Zero slope (horizontal line)- zero velocity
    - Positive displacement- graph is above zero
    - Negative displacement- graph is below zero
  + Velocity vs Time graphs
    - Slope = acceleration of object
      * Positive slope - positive acceleration
      * Negative slope - negative acceleration
      * Constant slope - constant acceleration (velocity is changing!)
      * Changing slope - changing velocity (acceleration)
      * Zero slope- can mean
        + constant velocity
        + No velocity- horizontal line on time axis
    - Area bound by graph (between graph and time axis)
      * Positive displacement- area bound by graph is above zero
      * Negative displacement- area bound by graph is below zero
  + Acceleration vs Time graphs
    - Slope = change in acceleration of object
      * Positive slope - positive change in acceleration
      * Negative slope - negative change in acceleration
      * Constant slope - constant acceleration (velocity is changing!)
      * Changing slope - changing velocity (acceleration)
      * Zero slope- can mean
        + constant acceleration (velocity is changing!)
        + No acceleration (constant velocity)- horizontal line on time axis
    - Area bound by graph (between graph and time axis)
      * Positive change in velocity- area bound by graph is above zero
      * Negative change in velocity- area bound by graph is below zero