Supplement 1-2 Review

This review is not all inclusive. You are expected to know how to do all the problems in the homework and the examples from the homework and text.

Supplement 1-2: Intro to rates of change (Distance and Speed).

1. A *secant* line is a line that goes through two points on the graph. A *diagonal* line is a line that goes through the origin.

2. Know the different types of speed:

   (a) *Actual Speed* = the speed on a speedometer
   = the slope of a tangent line that 'touches' the distance graph (This is studied in Math 112, Calculus).

   (b) *Average (Overall) Trip speed* = $\dfrac{\text{change in distance (since } t = 0)}{\text{change in time (since } t = 0)}$
   = average speed from the beginning to now
   = the slope of a secant line through the graph at $t = 0$ and the current time.

   (c) *Average Speed over an Interval (Incremental Speed)* = $\dfrac{\text{change in distance}}{\text{change in time}}$
   = average speed between two times
   = the slope of a secant line through the graph at the two times.

3. Pay attention to the graph that you are given in a problem. Sometimes you are given a distance graph and sometimes you are given a speed graph. Carefully write out what you know and use the definitions above to answer the questions. (In one of your questions you are given values of ATS instead of total distance, read carefully and use the definitions!)

4. Ruler Tricks:

   (a) To compute ATS or AS,

      i. Draw the secant line. Pick two 'easy to read' points and compute the slope. These points don't need to the points where it touches the graph, any two points on the line will work.
      ii. Compute the slope $= \frac{y_2 - y_1}{x_2 - x_1}$

   (b) When asked about ATS, fix the ruler at the point on the graph at $t = 0$ and rotate to answer the question.

   (c) When asked about AS over an interval, sequentially try the intervals (for example, 0 to 10, then 10 to 20, then 20 to 30, etc). Once you get close to the correct answer, fine tune your answer by trying in between these intervals.

   (d) Be as precise as you can. In the homework, print off the graphs from the course website and carefully compute with a ruler. Webassign is programmed to accept a range of answer, but that range is sometimes tight. On exams if you show your work and your answer is reasonable, then you will get full credit, but webassign can't check your work, so you need to be as precise as you can.