Math 4 Honors   Name _____
Lesson 6-1 Learning Check   Date _____

In this learning check, you will be assessed on the following concepts:
- *I can compute average rates of change in functions.*
- *I can find the formula for the difference quotient of a function and use it to solve problems.*
- *I can use secant lines to determine the average rates of change in graphs of functions.*

1. Consider the following function: $f(x) = 3x^3 - 2x + 8$
   Find the average rate of change from $x = -1$ to $x = 5$.

   $$A_{RoC} = 61$$

2. A projectile follows along a path given by the formula $h(t) = 480t - 16t^2$. Find a formula for the
   difference quotient given the average rate of change for each interval t to $t + \Delta t$.
   Work vertically; do not skip any steps.

   $$A_{RoC} = 480 - 32t - 16\Delta t$$

3. Use your answer from #2 and $t = 6$ to find the average velocity when . . .

   a.) $\Delta t = 2$ b.) $\Delta t = 1$ c.) $\Delta t = .5$ d.) $\Delta t = .01$

   256 ft/sec   272 ft/sec   280 ft/sec   207.84 ft/sec

   $$\lim_{\Delta t \to 0}\left(\frac{h(6 + \Delta t) - h(6)}{\Delta t}\right) = \underline{288 \text{ ft/sec}}$$

4. Refer to the graph at the right.

   a. Find the average rate of change
      from A to C. $\dfrac{5}{2}$

   b. Over what interval is the average rate
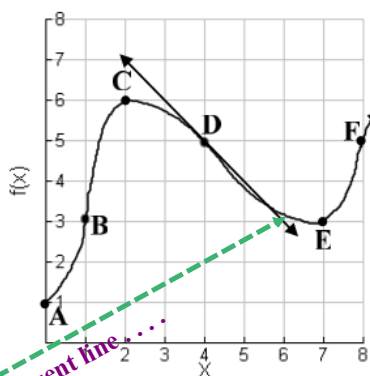   rate of change of f zero? $B \to E$ or $D \to F$

   c. Find the average rate of change in f
      over the interval $0 \le x \le 8$. $\dfrac{1}{2}$

   d. Estimate f' when $x = 4$.

      $$f'(4) = -1$$

   Use the tangent line