Written Assignment 2
Due Monday, October 10th

1. Do # 9-12 in section 2.5.

2. Evaluate each of the limits shown. If a limit does not exist, say so explicitly and explain why.

    (a) $\lim\limits_{t \to 0^+} \dfrac{15}{2t}$

    (b) $\lim\limits_{x \to 5} \dfrac{x+5}{(x-5)^2}$

    (c) $\lim\limits_{x \to 7} \dfrac{600}{x-7}$

3. An object is thrown out of a window that is 15 feet above ground. It starts with an initial velocity of 2 feet per second. The height as a function of time follows the formula

$$h(t) = -16t^2 + 2t + 15.$$

    (a) When does the object hit the ground?

    (b) What is the velocity, $v(t)$, as a function of time?

    (c) When does the velocity reach 0? How high is the object at this point in time?

4. We call a number t a *critical point* for a function f if $f'(t) = 0$.

    (a) For any function f, what is the slope of the tangent line at a critical point? What does this mean geometrically?

    (b) Find all critical points of the function $f(t) = t^2 + t + 1$.

    (c) Does the function $f(t) = 3 - 7t$ have any critical points?

5. Let $f(t) = \dfrac{1}{t}$. Using the limit definition of the derivative, calculate the function $f'(t)$. Does it agree with what you get using the power rule?

6. Find the tangent line to the function $G(s) = 14 + \dfrac{1}{\sqrt{2s}}$ at $s = 4$.