SECTION 2-7

1. Find the slope of the tangent line to $f(x) = 3x^2$ at $x = a$ by taking the limit of the slopes of secant lines. When you are done, check whether or not your solutions seems plausible!

2. Write the equation of the line tangent to the graph of $f(x) = 3x^2$ at $x = \frac{1}{2}$.

3. The derivative of a function f at $x = a$ is

4. Assume the tangent line to the graph of $y = f(x)$ at $x = \sqrt{2}$ is $y = \frac{4x-1}{3}$. Determine:

   (a) $f(\sqrt{2})$

   (b) $f'(\sqrt{2})$

5. The height in meters of an object is given by the function $s(t) = \frac{2t}{t+1}$ where t is measured in seconds.
   (a) Find $s'(a)$ using the definition in # 3 on this sheet.
   (b) Determine the units of $s'(a)$.
   (c) Find and interpret in the context of the problem the meaning of $s'(1)$.

6. Let $f(x) = \sqrt{90 - x}$
   (a) Find $f'(a)$ using the definition in # 3 on this sheet.
   (b) If f is measured in degrees celsius and x is measured in minutes, determine the units of $f'(a)$.
   (c) Find and interpret $s'(0)$.