2-7 EXAMPLES

1. Write two expressions for the slope of the tangent line to the function $f(x)$ at $x = a$. (Hint: Both should involve a limit. One has $x \to a$ and one has $h \to 0$. Try to produce the expressions by thinking about where they come from.)

   For all of the problems on this worksheet, you need to use one of the expressions above. You should NOT use a short-cut rule we have not yet covered.

2. For each function and a-value below, i) find the slope of the tangent line to $f(x)$ at $x = a$ and (ii) write the equation of the line tangent to $f(x)$ at $x = a$.

   (a) $f(x) = \sqrt{2x}$ when $a = 8$.

   (b) $f(x) = \frac{3}{2-x}$ when $a = 1$.

3. (a) For $f(x) = 2x - x^2$, find $f'(a)$.

(b) Find $f'(0)$, $f'(1)$, $f'(2)$ and $f'(3)$. (You could just make a table of values...)

(c) Do your answers to part (b) *seem* reasonable? Why or why not?