1. Find the equation of the tangent line to the curve at the given point.

   (a) $y = x^2 - 3x$, $(-2, 10)$.

   (b) $y = \sqrt{5x} + 4$, $(5, 9)$

   (c) $x^3 - 2x^2 + 5$, $(1, 4)$.

2. At time $t = 0$ a diver jumps from a platform diving board that is 32 feet above the water. The position of the diver is given by $s(t) = -16t^2 + 16t + 32$ where s is measured in feet and t is measured in seconds. Determine when the diver hits the water, and the divers velocity at impact.

3. Suppose $g(6) = 1$ and $g'(6) = -3$. Find the equation of the tangent line to curve $y = g(x)$ when $x = 6$.

4. Suppose the equation of the tangent line to a curve $y = f(x)$ at the point where $x = 2$, is $y = -x + 3$. Find $f(2)$ and $f'(2)$.

5. Find the derivative of the following functions using the definition of derivative. State the domain of the function and the domain of the derivative.

   (a) $f(x) = \sqrt{x} + 3$

   (b) $g(x) = \frac{2+t}{1-2t}$

6. For the following function, find $f'(x),\ f''(x),\ f'(3),\ f''(3)$.

$$f(x) = 3x^2 - 2x + 4$$