Reading Stewart §1.4 and §2.1.

1. Using the **limit definition of the derivative**:
   a) Find the slope of the tangent line to the curve $y = x^2 - 3x$ at the point where $x = -1$.
   b) Find the equation of the tangent line from part (a). Simplify your answer.

2. Using the **limit definition of the derivative**, find and simplify the equations of:
   a) the tangent line to the curve $y = x^3 + 2x - 7$ at the point $(2, 5)$.
   b) the tangent line to the curve $y = \sqrt{x}$ at the point $(1, 1)$.

3. An ant is crawling along a wire with position $s(t) = \dfrac{5}{t^2}$ centimeters down the wire at time t seconds after noon. Using the **limit definition of the derivative**, find its velocity:
   a) at time $t = 1$; b) at time $t = 2$.

4. Suppose $f(x)$ is a function with the property that $f(2) = 6$ and $f'(2) = -2$. Find an equation for the tangent line to the curve $y = f(x)$ at the point where $x = 2$. Simplify your answer.

5. Suppose $g(x)$ is a function with the property that the tangent line to $y = g(x)$ at the point $(4, 1)$ passes through the point $(6, -3)$. Find $g(4)$ and $g'(4)$.