

Derivatives and Rates of Change

Solutions should show all of your work, not just a single final answer.

1. Let $f(x)$ be a function and a a number in the domain of $f(x)$. Write down the limit definition of the derivative $f'(a)$ at $x = a$.
2. Find the derivative of the function $f(x) = \frac{3}{x}$ at $x = 1$ using the **limit definition** of the derivative (no credit for using any method other than the limit definition of the derivative), then find the equation of the tangent line to the graph $y = \frac{3}{x}$ at $x = 1$.
3. Find an equation of the tangent line to the graph of $y = f(x)$ at $x = 3$ if $f(3) = 2$ and $f'(3) = 4$.