



## Vocabulary: Graphs of Derivative Functions



### Vocabulary

- **Derivative** – the slope of the tangent line at a given point on a graph.
  - The derivative of  $f(x)$  is defined as  $f'(x) = \lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$ .
    - This means that  $f'(x)$  is the slope of the line between two points on a curve, as the distance between those points ( $\Delta x$ ) goes to zero.
    - $f'(x)$  is usually called “ $f$  prime” or “ $f$  prime of  $x$ .”
  - The derivative is the rate of change of the function at a given point.
    - In other words, the derivative describes how quickly  $f(x)$  (or  $y$ ) is changing, relative to  $x$ .
  - For example, the derivative of the quadratic function graphed to the right is  $f'(x) = 4x$ , so the slope of the tangent line at  $x = 1$  is  $f'(1) = 4(1)$ , or 4.
    - Function:  $f(x) = 2x^2 - 3$
    - Derivative:  $f'(x) = 4x$
    - Derivative at  $x = 1$ :  $f'(1) = 4(1) = 4$
  - The process of finding the derivative is called *differentiation*.

