Sec 2.8: The Derivative as a Function

• **Derivative as a Function:** The derivative of a function at a number a, denoted by f'(a), is

$$f'(a) = \lim_{h \to 0} \frac{f(a+h) - f(a)}{h} = \lim_{x \to a} \frac{f(x) - f(a)}{x - a}$$

provided that this limit exists.

- Differentiable Function: A function f is differentiable at a if f'(a) exists. It is differentiable on an open interva (a, b) [or (a, ∞) or $(-\infty, a)$ or $(-\infty, \infty)$] if it is differentiable at every number in the interval.
- Theorem 2.11: If f is differentiable at a, then f is continuous at a.