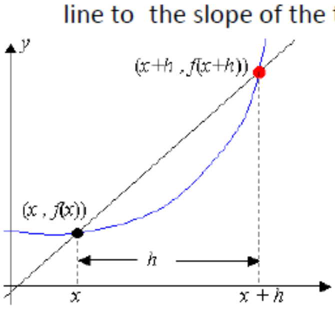
Definition of a Derivative

"h is the same as delta x"

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

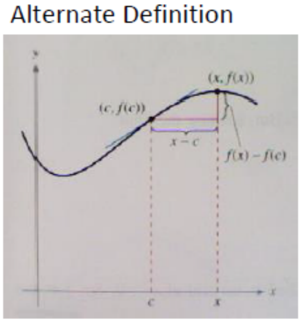
Definition of the Derivative

The derivative of the function *f*, or instantaneous rate of change, is given by converting the slope of the secant line to the slope of the tangent line by making the change is x, Δx or h, approach zero.



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

Alternate Definition



$$f'(c) = \lim_{x \to c} \frac{f(x) - f(c)}{x - c}$$

Definition of the Derivative:

$$f'(x) = \lim_{\Delta x \to \infty} \frac{f(x + \Delta x) - f(x)}{\Delta x} \qquad f'(x) = \lim_{h \to \infty} \frac{f(x+h) - f(x)}{h}$$

$$f'(a) = \lim_{h \to \infty} \frac{f(a+h) - f(a)}{h} \qquad \textit{derivative at } x = a$$

$$f'(x) = \lim_{x \to a} \frac{f(x) - f(a)}{x - a} \qquad \textit{alternate form}$$

Definition of Derivative
(slope of the tangent line)

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