

Source: [KBhMATH401SubIndex](#)

## 1 | Derivatives

=> Instantaneous rate of change at a particular point

- Average rate of change =  $\frac{\Delta Y}{\Delta X}$

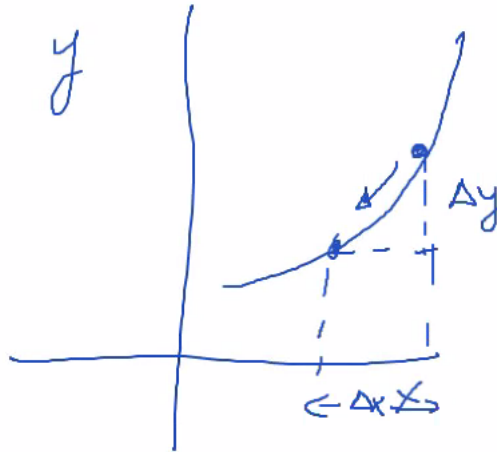
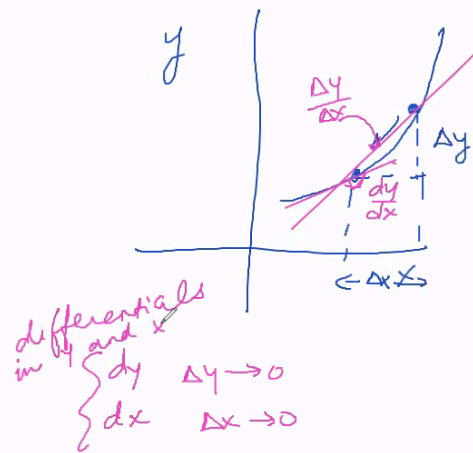


Figure 1: rateofchange.png

- Instantaneous rate of change =  $\lim_{\Delta x \rightarrow 0} \frac{\Delta Y}{\Delta X}$

Derivative of  $f(x)$  =>  $\frac{dy}{dx}$

Derivative of a function is its instantaneous rate of change



Average Rate of Change =  $\frac{\Delta y}{\Delta x}$

Instantaneous Rate of Change

$$\frac{dy}{dx} = \lim_{\Delta x \rightarrow 0} \frac{\Delta y}{\Delta x} = \text{slope of the tangent line}$$

Derivative of  $y = f(x)$  with respect to

Figure 2: derivativesWB.png

## 1.1 | Useful Table of Derivatives

$f(x)$	$f'(x)$
$x^2$	$2x$