1 | Derivatives

- => Instantaneous rate of change at a particular point
 - Average rate of change = $\frac{\Delta Y}{\Delta X}$

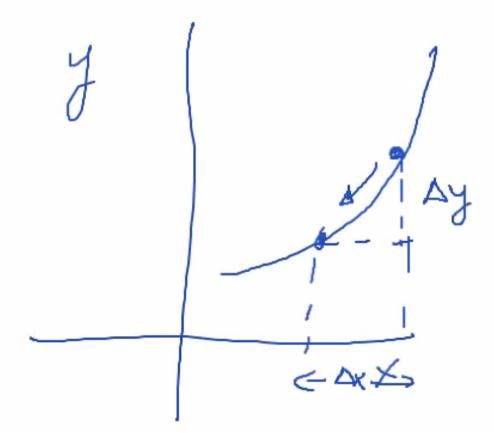


Figure 1: rateofchange.png

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

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

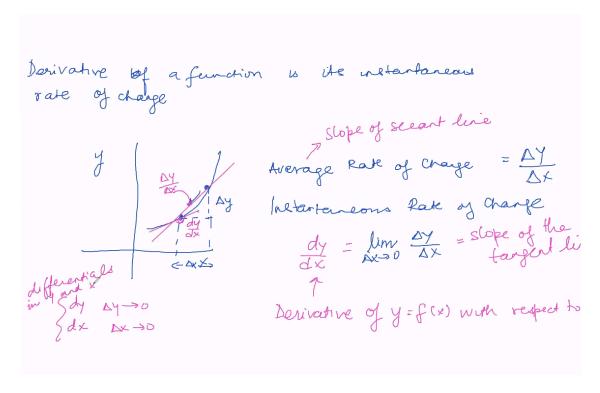


Figure 2: derivativesWB.png

1.1 | Useful Table of Derivatives

f(x)	f'(x)
x^2	2x
x^3	$3x^2$
x^n	nx^{n-1}
$\frac{1}{x}$	$\frac{-1}{x_1^2}$
$\sqrt[x]{x}$	$\frac{1}{2\sqrt{x}}$
sin(x)	$\cos(x)$
$\cos(x)$	$-\sin(x)$
tan(x)	$1 + \tan^2(x) = \sec^2(x)$
$\cot(x)$	$-\csc^2(x)$
sec(x)	tan(x) sec(x)
$\csc(x)$	$-\cot(x)\csc(x)$
e^x	e^x
ln(x)	$\frac{1}{x}$
a^x	$\overset{x}{a}^{x}ln(a)$
$log_a(x)$	$\frac{1}{xln(a)}$
$f^{-}1(x)$	$\frac{1}{f'(f^-1(x))}$
$sin^-1(ax)$	$\frac{a}{\sqrt{1-(ax)^2}}$
$cos^-1(ax)$	$\frac{\sqrt{1-(ax)}}{\sqrt{1-(ax)^2}}$
$tan^-1(ax)$	$\frac{1}{1+(ax)^2}$