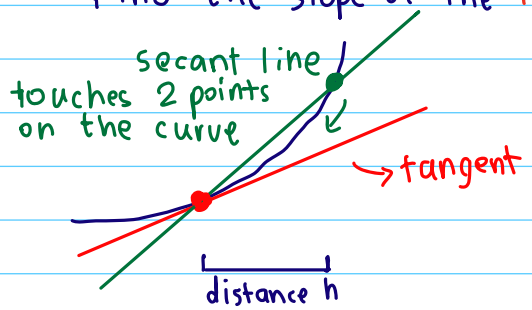
OCT 5

Derivative is SLOPE of tangent line

↳ ANY point on a curve

$$\frac{d}{dx} f(x) = m_x$$

Find the slope of the tangent line → draw a secant line



slope of secant $= \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{f(x+h) - f(x)}{x+h-x}$

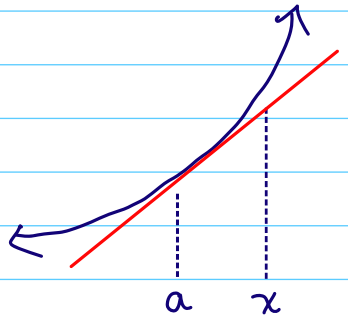
$= \frac{f(x+h) - f(x)}{h}$

slope of secant is closer to slope of tangent when ● moves closer to ●

THEN

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

↖ less h = less distance



finding slope of tangent line at a

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{derivative} = \lim_{x \to a} \frac{f(x) - f(a)}{x - a}$$

OCT 25

Notations

$$\frac{d}{dx} y = \frac{dy}{dx} = y' = f'(x) = m$$

Multiple Derivative → $\frac{d}{dx} y' = y'' = y^{(2)}$ —OR— $\frac{d}{dx} \frac{dy}{dx} = \frac{d^2y}{dx^2}$

NEWTON LEIBNIZ

$$y^{(n)} = \frac{d^n y}{dx^n} = n^{th} \text{ derivative of } y$$