

B.2 Notes: Slope/Rate of Change

Rate of Change: How one variable changes in relation to another variable. Expressed as a ratio between how the variables are changing.

Ex: $\frac{60 \text{ miles}}{1 \text{ hr}}$ or 60 mph

$\frac{5 \text{ p+s}}{1 \text{ game}} \rightarrow$ Jack scores 5 points each game.

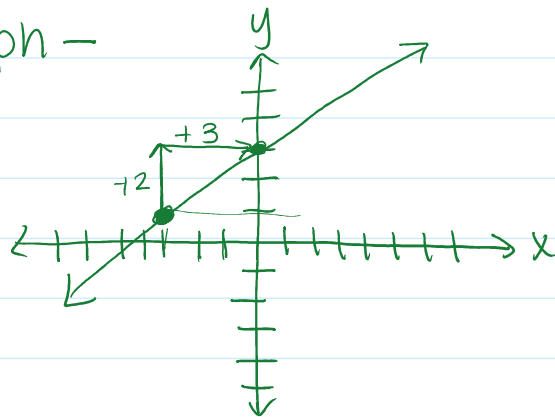
Slope: change in variable y over the change in x .

* Slope is a type of rate of change

* 'm' is used to represent slope

Ex:

Graph -



$$\text{slope} = \frac{\text{rise}}{\text{run}} = \left(\frac{2}{3}\right)$$

Equation of Line - $(y = mx + b)$

↑
slope

$$y = \frac{1}{2}x + 11$$

↑ slope is $\left(\frac{1}{2}\right)$

Given Two Points -

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

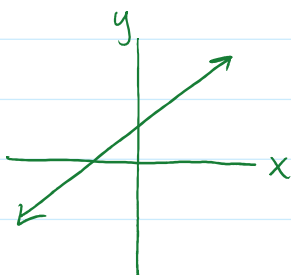
$$\begin{matrix} (-3, 1), & (0, 3) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 1}{0 - (-3)} = \frac{2}{3}$$

$(-3, 1)$ $(0, 3)$
 $x_1 \ y_1$ $x_2 \ y_2$

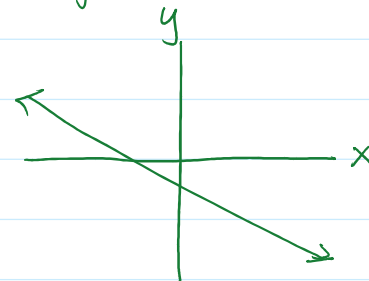
Types of Slope:

① Positive



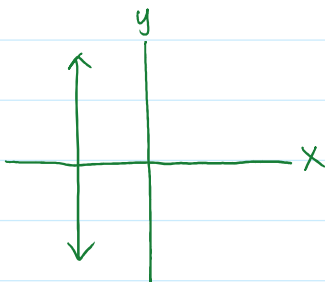
$x \uparrow$ $y \uparrow$
 $x \downarrow$ $y \downarrow$

② Negative



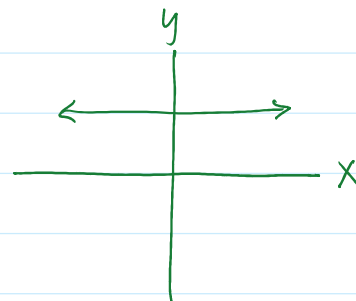
$x \uparrow$ $y \downarrow$
 $x \downarrow$ $y \uparrow$

③ No Slope or Undefined



x has no change
 $\frac{y}{0}$

④ Zero



y has no change
 $\frac{0}{x}$