

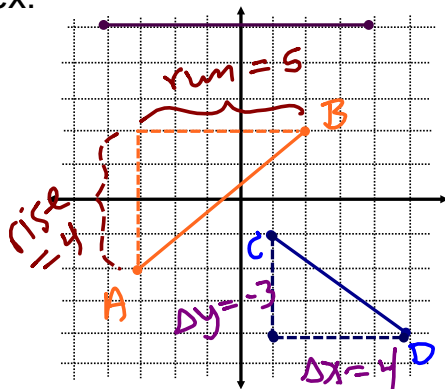
## 6.1 Slope of a Line

\* The slope or steepness of a line is given by:

$$m = \frac{\text{vertical displacement}}{\text{horizontal displacement}} \quad \text{or } m = \frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}}$$

\* Positive slope increases from left to right while negative slope decreases from left to right.

ex.



$$m_{AB} = \frac{4}{5}$$

$$m_{CD} = -\frac{3}{4}$$

\* a horizontal line has a slope =  $\frac{\Delta y}{\Delta x} = \frac{0}{8}$

$$m = 0$$

could be anything

Note  $-\frac{1}{2} = -\frac{1}{2} = -\frac{1}{2}$

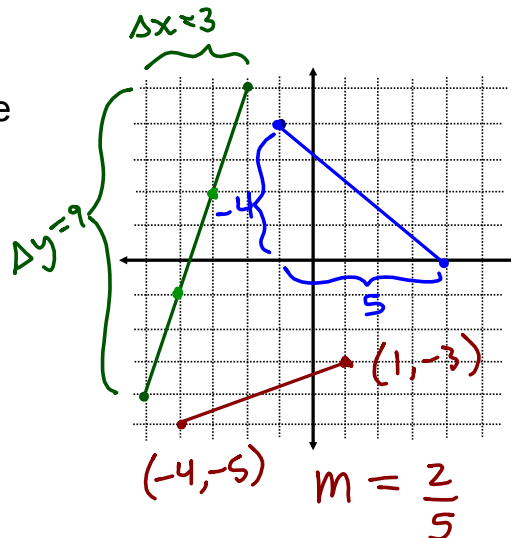
Ex. Draw a line segment that has the following slopes

a)  $m = 3$

$$= \frac{3}{1} = \frac{\Delta y}{\Delta x}$$

b)  $m = -4/5$

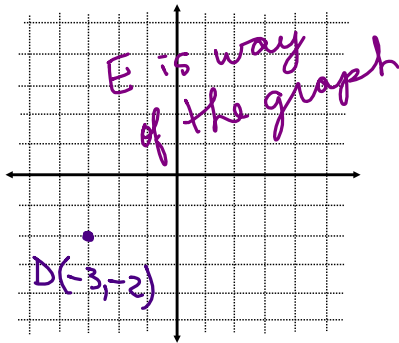
$$\frac{\Delta y}{\Delta x} = -\frac{4}{5}$$



\* Regardless of the points used to calculate the slope of a line, the slope will always be the same.

Slope: If a line passes through  $A(x_1, y_1)$  and  $B(x_2, y_2)$ , the equation for slope is

$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$$



ex. Find the slope of the line that passes through  $D(-3, -2)$  and  $E(10, 5)$

$$(x_1, y_1) = (-3, -2)$$

$$(x_2, y_2) = (10, 5)$$

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

$$= \frac{5 - (-2)}{10 - (-3)}$$

$$= \frac{5 + 2}{10 + 3}$$

$$m = \frac{7}{13}$$

or

$$(x_1, y_1) = (10, 5)$$

$$(x_2, y_2) = (-3, -2)$$

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

$$= \frac{-2 - 5}{(-3) - 10}$$

$$= \frac{-7}{-13} = \frac{7}{13}$$

Same ↗

