

## Warm up

1. Find the x and y intercepts of the equation.

a)  $y = x + 2$

Handwritten work for part a):

**x-int**  
 $y = 0$   
 $0 = x + 2$   
 $-2 = x$   
 $(-2, 0)$

**y-int**  
 $x = 0$   
 $y = -0 + 2$   
 $y = 2$   
 $(0, 2)$

b)  $-4x + 3y = 24$

Handwritten work for part b):

**x-int**  
 $y = 0$   
 $-4x + 3(0) = 24$   
 $-4x = 24$   
 $x = -6$   
 $(-6, 0)$

**y-int**  
 $x = 0$   
 $-4(0) + 3y = 24$   
 $3y = 24$   
 $y = 8$   
 $(0, 8)$

Then take out your HW from yesterday and Finish the graphing (4.3 p.221 #14-54even)

## Homework Questions?

On the top of your paper (by your name) rate yourself for this section:

4 - I can summarize the concepts and explain it to others

3 - I can apply the concept to answer questions correctly

2 - I can apply the concepts but with some mistakes

1 - I need help and know how to apply the concept

0 - I can't apply the concept, even with help

\*Rating of 0-2 is a warning signal to me that you need help\*

## 4.4 The Slope of a Line

### Goals:

- Find the slope of a line using two of its points.
- Interpret slope as a rate of change in real-life situations.

### EQ:

How do you use  
the slope formula  
to find the slope  
between (3, -2)  
and (2, 1)?



NAME: \_\_\_\_\_  
DATE: \_\_\_\_\_ Mo/Date/Year

Algebra 1.5

② LAST UNIT/Experience <b>Solving Linear Equations</b>	① CURRENT UNIT <b>Graphing Linear Equations &amp; Functions</b>	③ NEXT UNIT/Experience <b>Writing Linear Equations</b>
⑧ Student Activities or Assignments  4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8	⑤ UNIT MAP  	⑥ UNIT RELATIONSHIPS  Graph Determine Identify Calculate
⑦ UNIT SELF-TEST QUESTIONS  1. How do you use a table to graph a line? 2. How do I find the intercepts in order to graph a line? 3. How can I calculate the slope with coordinates, or a graph, or a real world situation? 4. How do I write and solve a direct variation model? 5. How can I graph a line using the slope and y-intercept? 6. How can I determine a function and then evaluate it?		

## Vocabulary

### Slope:

steepness of a line

$\frac{\text{rise (up/down)}}{\text{run (left/right)}}$

### Rate of change:

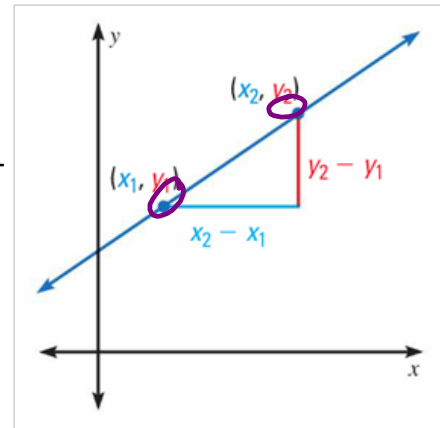
Compares 2 quantities that are changing at a constant rate

### Finding the slope of a line.

The slope,  $m$ , of the nonvertical line passing through the point  $(x_1, y_1)$  and  $(x_2, y_2)$  is

$$m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{\Delta y}{\Delta x}$$



### Example

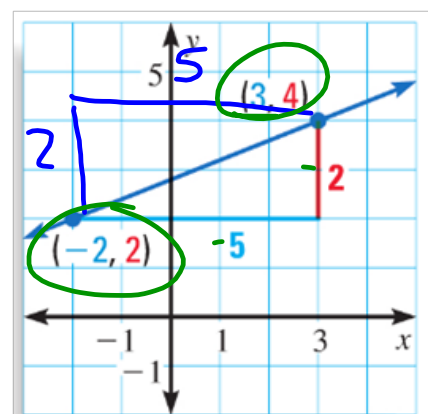
Find the slope of a line passing through  $(-2, 2)$  and  $(3, 4)$ .

$$m = \frac{\text{rise}}{\text{run}} = \left(\frac{2}{5}\right)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 4}{-2 - 3} = \frac{-2}{-5}$$

$$= \left(\frac{2}{5}\right)$$

$(-2, 2)$   
 $(3, 4)$   
 $x \quad y$

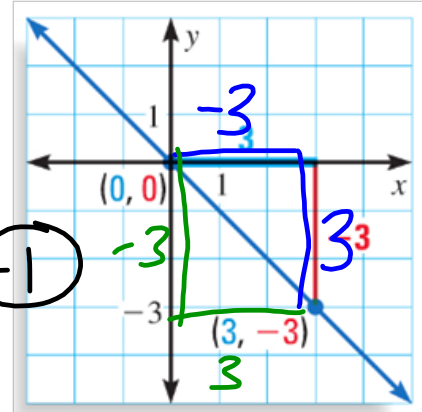


### Try It

Find the slope of the line passing through (0, 0) and (3, -3).

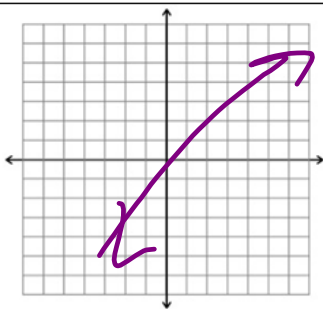
$$m = \frac{\text{rise}}{\text{run}} = \frac{3}{-3} = -1$$

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

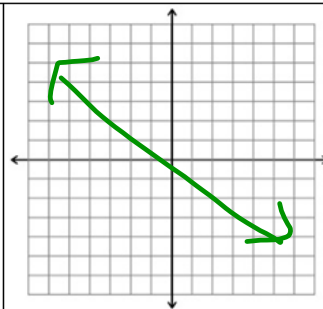


$(0, 0)$   
 $(3, -3)$   
 x    y

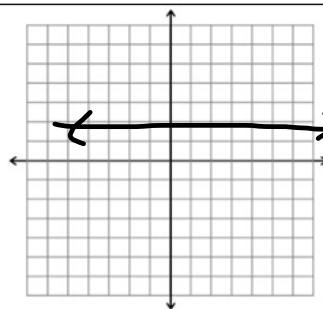
### Classification of lines by slope



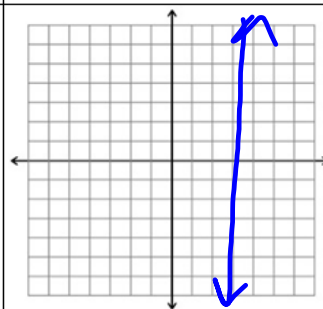
A line with a positive slope rise from left to right.



A line with a negative slope falls from left to right.



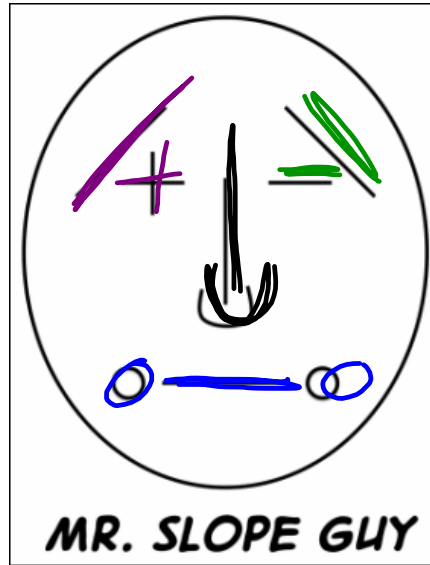
A line with a zero slope is horizontal  
 $y = \#$



A line with an Undefined slope is vertical  
 $x = \#$

$$\frac{0}{2} = 0$$

$$\frac{5}{0} \leftarrow \text{undefined}$$

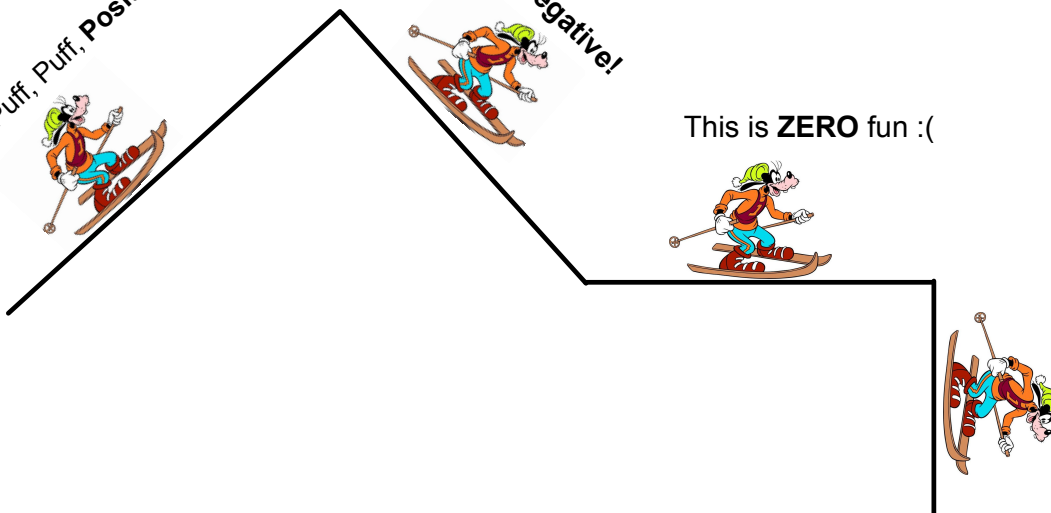


Puff, Puff, Positive

Nice Negative!

This is ZERO fun :(

UNDEFINED!



**Example: Finding the Slope of a Line**

Find the slope of the line passing through the points.  
Then classify the line by its slope.

a.  $(-2, -3), (1, 2)$

$$\begin{matrix} (1, 2) \\ \downarrow \\ x \quad y \end{matrix}$$

$$m = \frac{-3 - 2}{-2 - 1} = \frac{-5}{-3} = \frac{5}{3}$$

positive

b.  $(-2, -3), (4, -3)$

$$\begin{matrix} (4, -3) \\ \downarrow \\ (-2, -3) \end{matrix}$$

$$m = \frac{-3 - (-3)}{4 - (-2)} = \frac{0}{6} = 0$$

zero slope

c.  $(-1, -4), (-1, -2)$

$$\begin{matrix} (-1, -4) \\ \downarrow \\ (-1, -2) \end{matrix}$$

$$m = \frac{-2 - (-4)}{-1 - (-1)} = \frac{2}{0} \leftarrow \text{undefined}$$

**Try It** Find the slope, then classify the line.

1)  $(-5, 2), (4, -1)$

$$\begin{matrix} (4, -1) \\ \downarrow \\ (-5, 2) \end{matrix}$$

$$\frac{2 - (-1)}{-5 - 4} = \frac{3}{-9} = -\frac{1}{3}$$

negative

2)  $(6, 2), (9, 2)$

$$\begin{matrix} (9, 2) \\ \downarrow \\ (6, 2) \end{matrix}$$

$$\frac{2 - 2}{9 - 6} = \frac{0}{3} = 0$$

zero

3)  $(-7, 0), (-7, 8)$

4)  $(2, -4), (8, 6)$

## Summary

**EQ:** How do you use the slope formula to find the slope between (3, -2) and (2, 1)?

( , )  
( , )



## 4.4 Homework

slope worksheet

$$\frac{0}{k}$$

$$= 0$$

$$\frac{N}{0}$$

undefined



