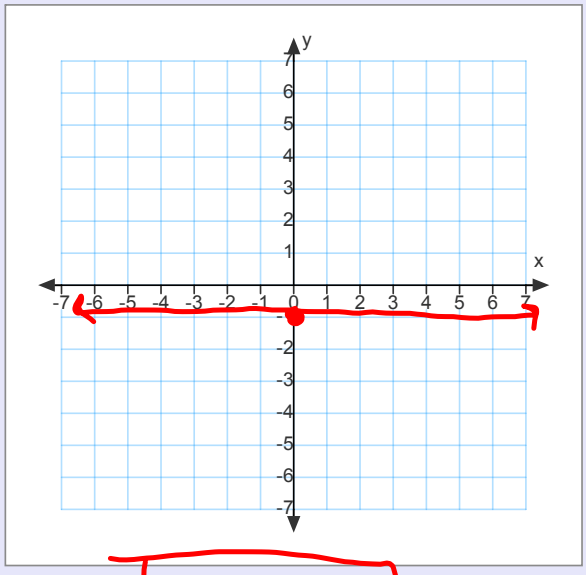
4.4 - SLOPE

Slope- The rate of change of a line

Rate of Change-By how much is a line increasing or decreasing

slope → 0

Ex 1: $y = -1$



Horizontal

or

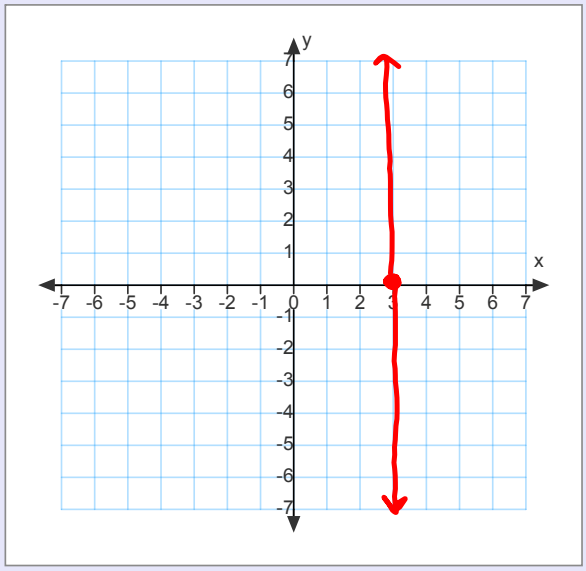
Vertical

By how much is the line increasing or decreasing?

its not

So we say its slope is 0.

Ex 2: $x = 3$



Horizontal

or

Vertical

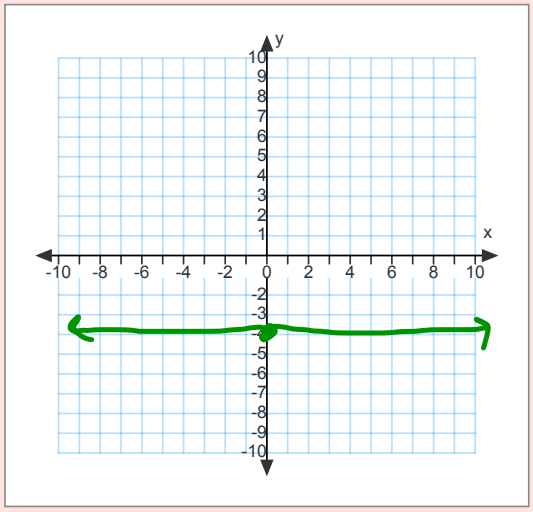
By how much is the line increasing or decreasing?

∞

So we say its slope is und.

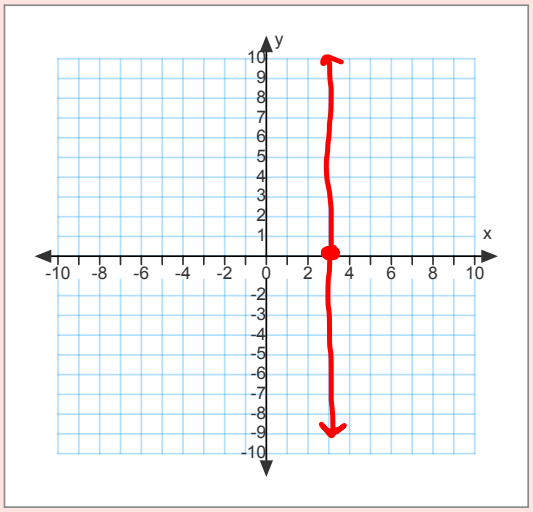
und means undefined

1. Graph y = -4



Slope = 0

2. Graph x = 3



Slope = und

3. The Rate of Change describes the slope of a line. What did we define Rate of Change to be?

a. A horizontal line has slope equal to 0.

b. A vertical line has slope equal to und.

Can lines have slope of anything other than zero or undefined?

When we add another variable to an equation, we will get a line with a slope other than zero or undefined.

Examples:

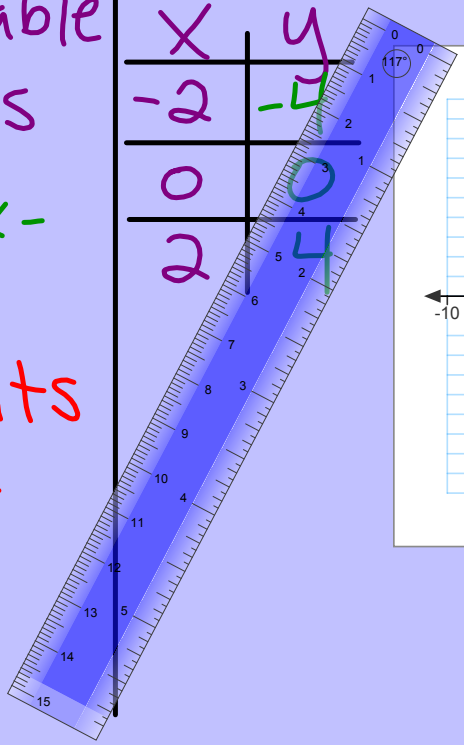
1. $y = 3x$
2. $y = -3x$
3. $y = 100x$

Steps to Graphing Lines

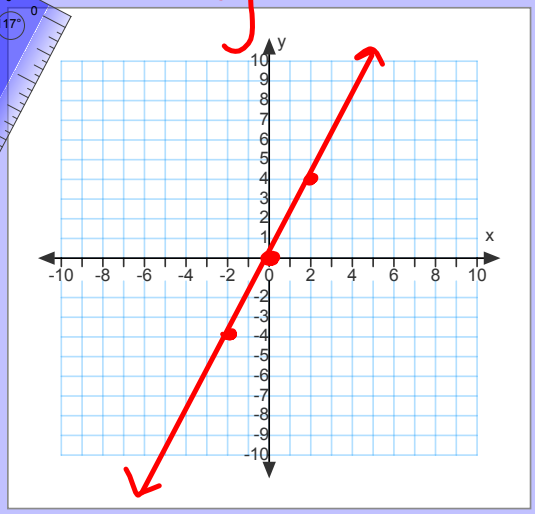
1. Make a table & Pick 3 #s
2. Plug in x-values
3. Plot points & connect dots

Ex 1: Graph $y = 2x$

x	y
-2	-4
0	0
2	4



$y = 2x$

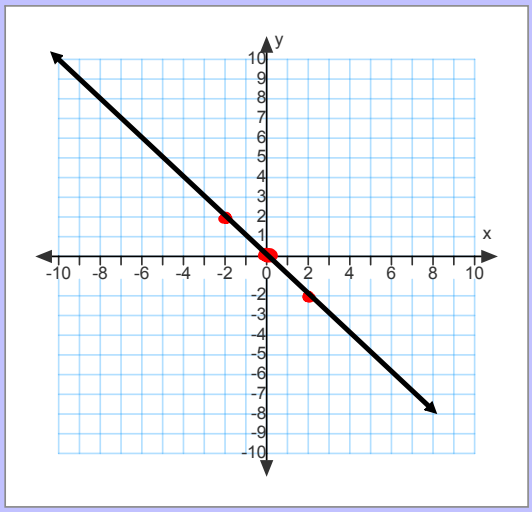


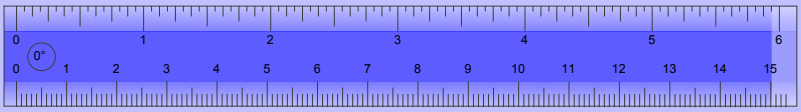
Steps to Graphing Lines

1. Make a table & Pick 3 #s
2. Plug in x-values
3. Plot points & connect dots

Ex 1: Graph y = -x

x	y
-2	2
0	0
2	-2





The number in front of the x in the equation is represented by the variable m.

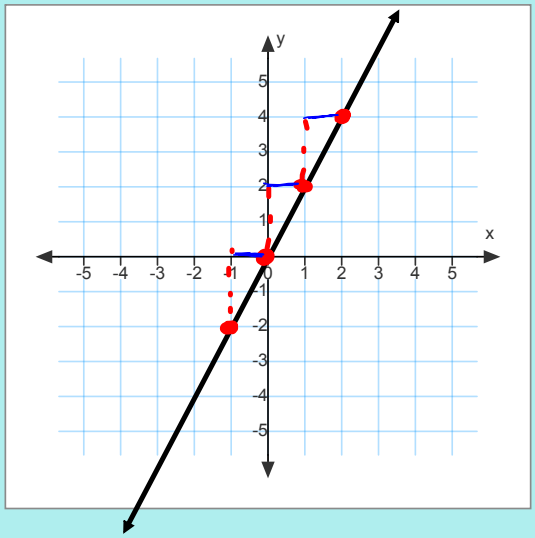
m = slope

We have talked about slope being the rate of change.

Another way we define slope is:

$$\text{slope} = \frac{\text{rise}}{\text{run}} \quad \frac{y}{x}$$

The line y=2x looks like:



The rise is the vertical change from point to point.

rise = 2

The run is the horizontal change from point to point.

run = 1

If the rise is 2 and the run is 1 then the slope is $\frac{2}{1}$.

$\frac{\text{rise}}{\text{run}}$ $\frac{2}{1}$

$y = 3(-2)$

Examples to try on your own.

For each equation, please

1. Make a **table**
2. Plot the **points**
3. **Graph** the line
4. Find the **rise** and the **run**
5. Tell me the **slope**

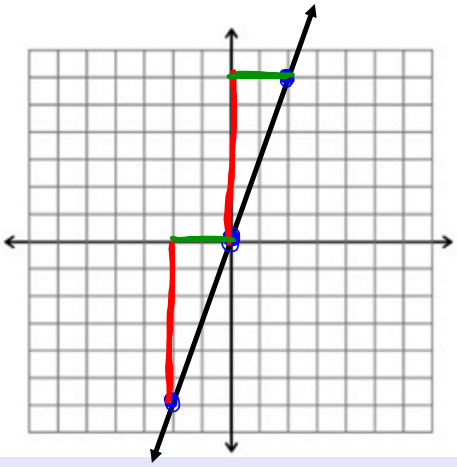
1. $y = 3x$

x	y
-2	-6
0	0
2	6

rise = 6

run = 2

slope = $\frac{6}{2} = \frac{3}{1}$



$-2(-2)$

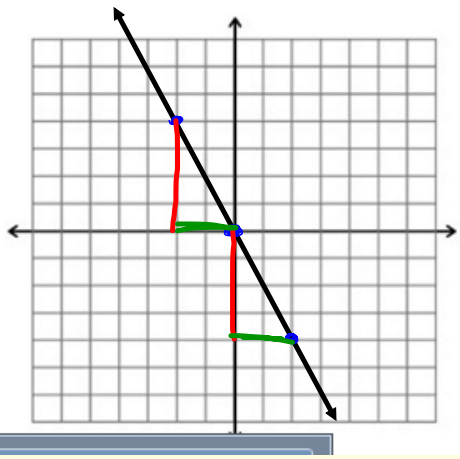
2. $y = -2x$

x	y
-2	4
0	0
2	-4

rise = $\frac{-4}{2}$

run = 2

slope = $\frac{-4}{2} = \frac{-2}{1}$



Homework!

Complete Problems 3-8