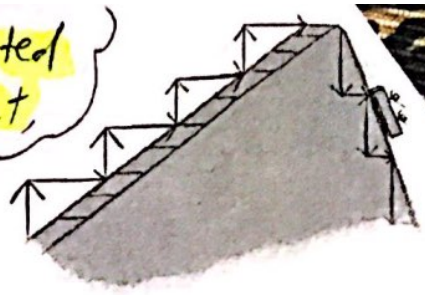
Slope! ★ Find these notes + examples posted on my website! Videos to support, too!



The steepness of a line is called Slope!

Circle the line with the biggest slope... ↔ ↙ ↕

The letter we use for slope is a lowercase m! Why?! Because it comes from the French word *monter* which means to climb or to rise. FUN FACT!

When given a graph of a line, we need to know a simple definition of slope:

$$m = \frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}} = \frac{\updownarrow}{\leftrightarrow}$$

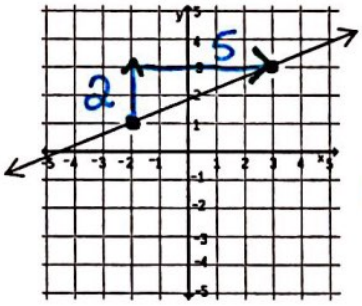
** Slope is the ratio of a line's vertical change to its horizontal change. That's what we mean by "*rise over run*"!

How to find the slope of a line when given a graph of a line:

1) Start at the point farthest to the left!

2) Find the *rise!* Up: +2
Down: _____

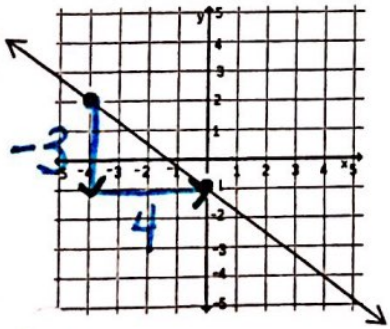
3) Find the *run!* Right: +5
Left: _____

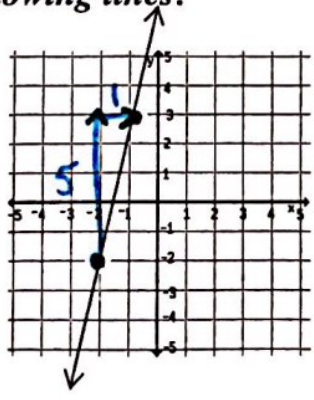


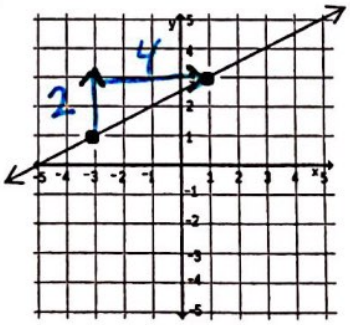
$m = \frac{\Delta y}{\Delta x} = \frac{2}{5}$

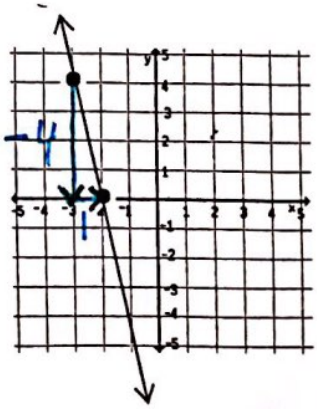
$m = \frac{\text{rise}}{\text{run}} = \frac{2}{5}$

Find the slope of the following lines!









$m = \frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}} = \frac{-3}{4} = -\frac{3}{4}$

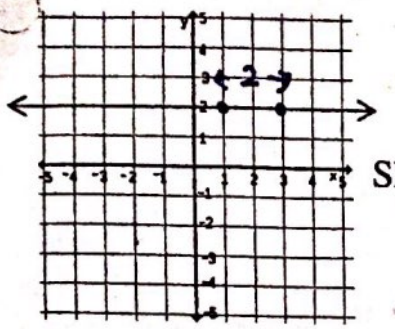
$m = \frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}} = \frac{5}{1} = 5$

$m = \frac{\Delta y}{\Delta x} = \frac{2}{4} = \frac{1}{2}$

$m = \frac{-4}{1} = -4$

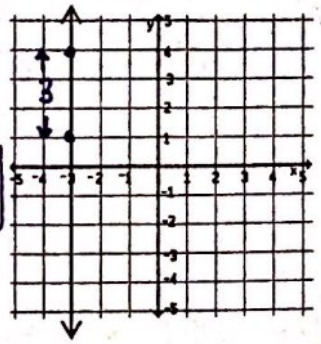
Horizontal and Vertical Lines...

Horizontal Line



Slope = $\frac{\Delta y}{\Delta x} = \frac{0}{2} = \boxed{0}$

Vertical Line



Slope = $\frac{\Delta y}{\Delta x} = \frac{3}{0} =$ error!

undefined!

Sometimes we are not given a picture, but instead we are given 2 points on the line. When this is the case, we must implement another definition of slope:

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

In other words, slope is $\frac{\text{Change in } y}{\text{Change in } x}$

How to find the slope of a line when given two points on the line:

1) Subtract one y-value from another y-value!
(It helps to draw arrows!) $7 - 3$

2) Subtract one x-value from another x-value!
(It helps to draw arrows!) $1 - (-2)$

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

(-2, 3) and (1, 7)
x_1 y_1 x_2 y_2

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-3}{1-(-2)} = \frac{4}{1+2} = \boxed{\frac{4}{3}}$

Or Tiny Table:

① make a table

② draw arrows.

Ask yourself, how many spaces and in what direction do you go to get from one value to the next?

x	y
-2	3
1	7

+3, +4

③ Write slope as: $m = \frac{\Delta y}{\Delta x}$ Done!

$m = \frac{\Delta y}{\Delta x} = \boxed{\frac{4}{3}}$

Find the slope of the line that passes through each pair of points:

(6, -1) & (4, 2)

x	y
6	-1
4	2

-2, +3

$m = \frac{\Delta y}{\Delta x} = \frac{3}{-2} = \boxed{-\frac{3}{2}}$

(3, -2) & (4, 3)

x	y
3	-2
4	3

+1, +5

$m = \frac{\Delta y}{\Delta x} = \frac{5}{1} = \boxed{5}$

(6, 5) & (3, 4)

x	y
6	5
3	4

-3, -1

$m = \frac{\Delta y}{\Delta x} = \frac{-1}{-3} = \boxed{\frac{1}{3}}$

(-1, 7) & (-3, 1)

x	y
-1	7
-3	1

-2, -6

$m = \frac{\Delta y}{\Delta x} = \frac{-6}{-2} = \boxed{3}$