Slope

Lesson Three
Slope from Tables

Time (in hours)	# of Cookies Eaten
0	0
1	4
3	12
10	40

RECAP

What is Slope?

Slope is the rate of change of a line

$$slope = \frac{rise}{run}$$

$$slope = \frac{\Delta y}{\Delta x} \qquad \frac{\text{(change in y)}}{\text{(change in x)}}$$

What does the line look like when…

- You have positive slope?
- You have negative slope?
- You have zero slope?
- You have NO slope?

Positive slope, + work

Negative slope, - work

Zero slope is zero fun!

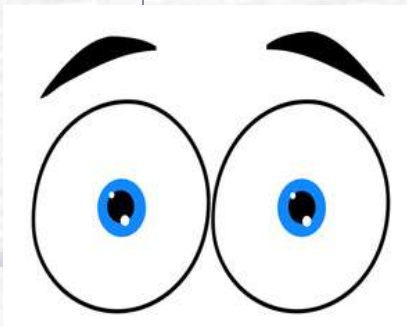
NO slope.

Oh No!!!!

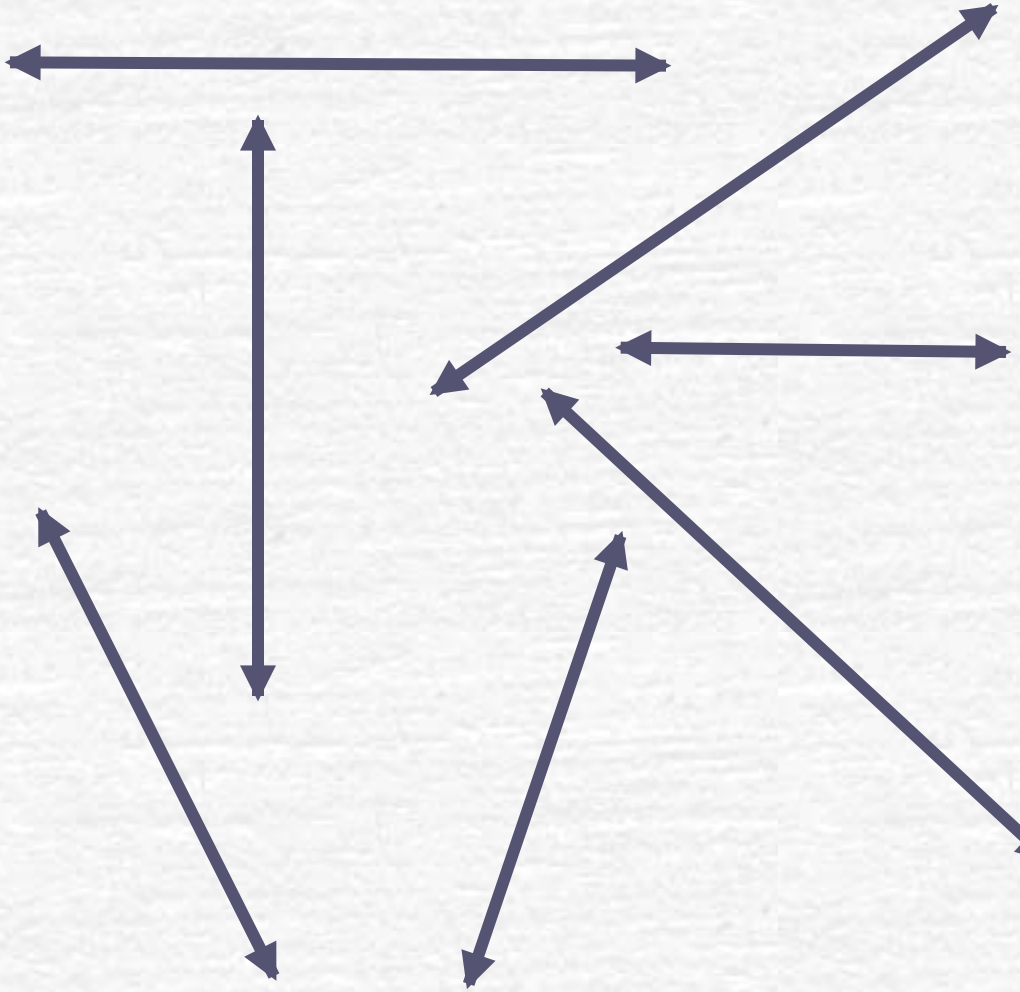
Slope Mountain

Ski Resort

https://www.youtube.com/watch?v=avS6C6_kvXM



What Type of Slope is Shown?

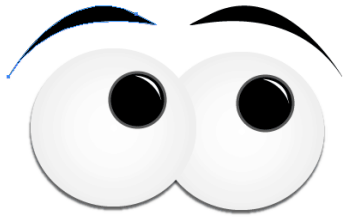


Positive Slope

Negative Slope

Zero Slope

No Slope/Undefined



Slope of a Graph

- When slope is positive or negative we need to find the actual value of the slope or rate of change.
- On a graph we find slope using the formula.

$$slope = \frac{rise}{run}$$

How far up or down it changes

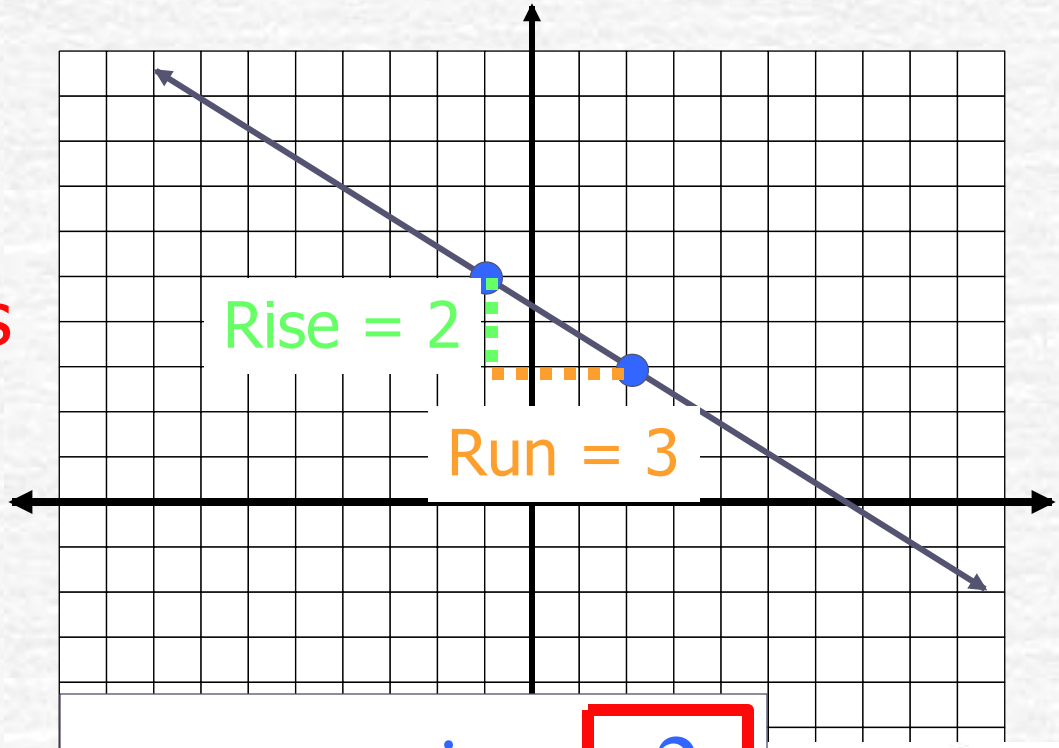
How far left or right it changes

Slope of a Graph

1. First pick two points on the line

The points need to be where the lines cross so they are integers

2. Then find the rise and run
3. Determine if the slope of the line is positive or negative



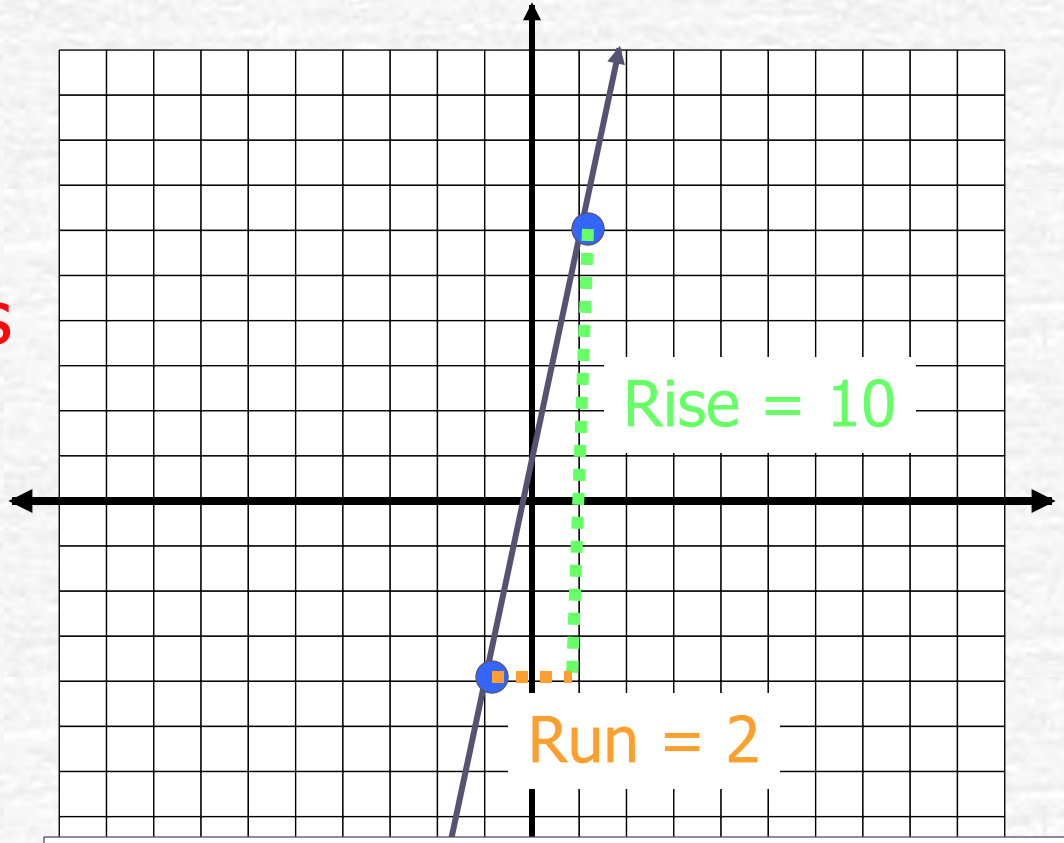
$$slope = \frac{rise}{run} = \frac{-2}{3}$$

Slope of a Graph

1. First pick two points on the line

The points need to be where the lines cross so they are integers

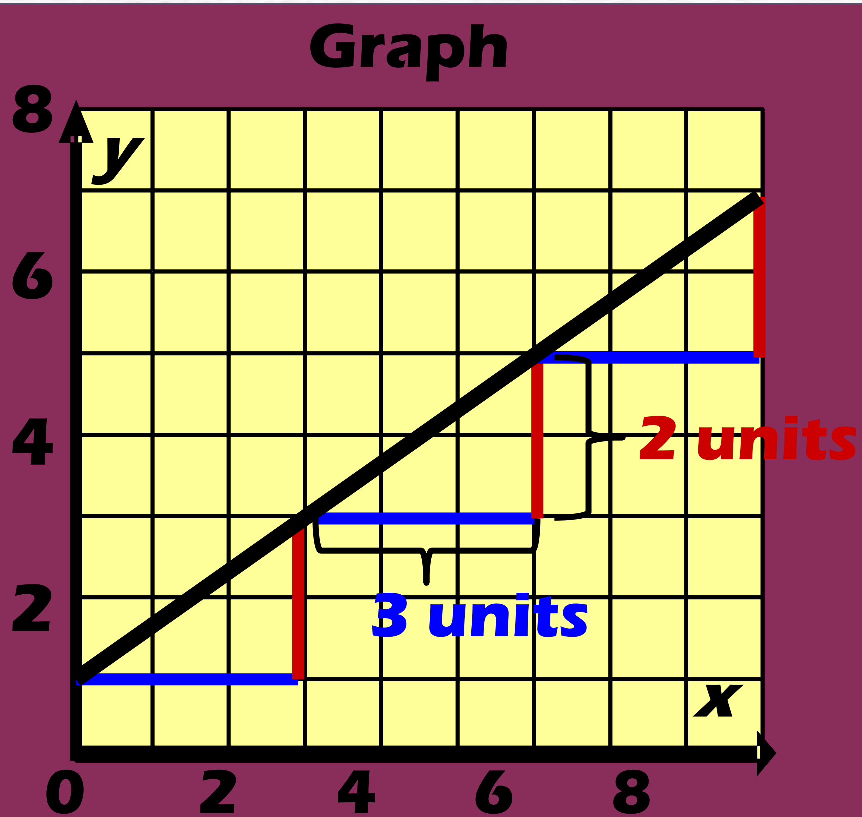
2. Then find the rise and run
3. Determine if the slope of the line is positive or negative

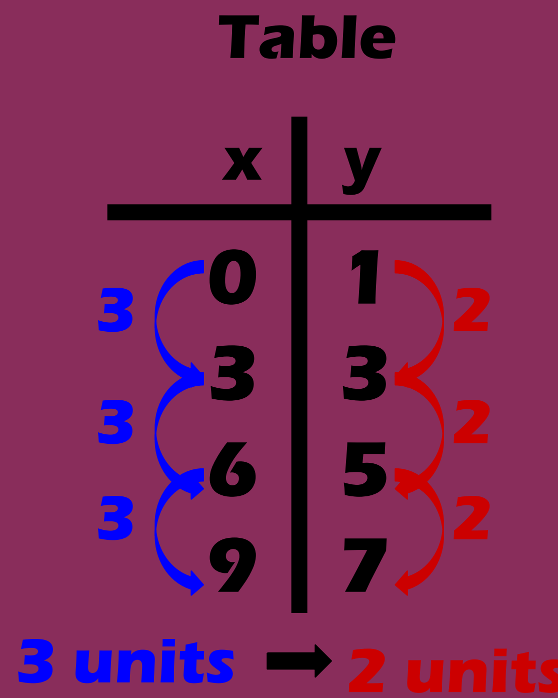


$$slope = \frac{rise}{run} = \frac{10}{2} = 5$$

Slope from a Table

You can find the slope of a line if the points from the line are put into a table. We use a special formula.





The slope is 2 .

Slope Formula

We can use the slope formula to find the slope from a table. Here it is. Copy it into your notes. You will need to learn this formula as you will be using it often.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

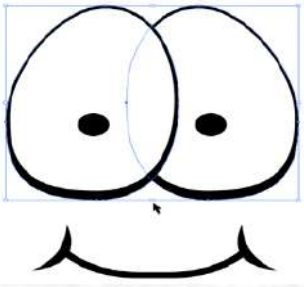
Slope from a Table

- **In a table we can find the rate of change by finding the change in y and the change in x.**
- **We can use any two points from the table that show some form of pattern.**

	x	y	
	-4	-17	
x_1	1	-2	y_1
x_2	3	4	y_2
	8	19	
	10	25	

Pick any two rows.
If it is linear it will be the same no matter which two rows you pick

$$slope = \frac{4 - -2}{3 - 1} = \frac{4 + 2}{3 - 1} = \frac{6}{2} = 3$$



Examples

- Find the slope for each table below

x	y
-3	4.25
-1	2.75
0	2
1	1.25
5	-1.75

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

$$= \frac{2.75 - 4.25}{-1 - -3}$$

$$= \frac{-1.5}{2}$$

$$= -0.75 = \boxed{\frac{-3}{4}}$$

x	y
-8	2
-6	3
-3	4.5
-1	5.5
0	6

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

$$= \frac{3-2}{-6--8}$$

$$= \frac{3-2}{-6+8}$$

$$= \boxed{\frac{1}{2}}$$

- Find the slope for each table below

x	y
-10	17
-5	10
-1	4.4
5	-4
10	-11

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

$$= \frac{10 - 17}{-5 - -10}$$

$$= \frac{10 - 17}{-5 + 10}$$

$$= \boxed{\frac{-7}{5}}$$

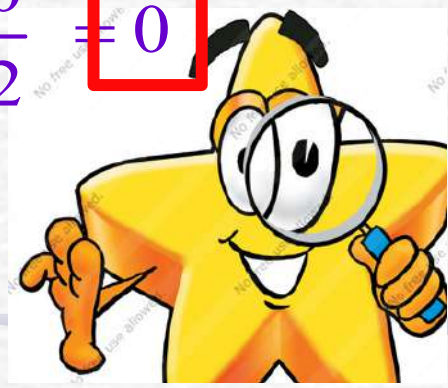
x	y
-3	-8
-1	-8
0	-8
1	-8
4	-8

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

$$= \frac{-8 - -8}{-1 - -3}$$

$$= \frac{-8 + 8}{-1 + 3}$$

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



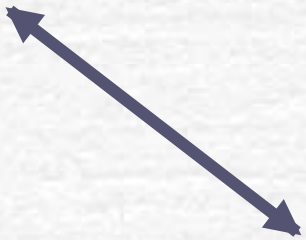
Conclusion

- Slope is:

the rate of change of a line

$$slope = \frac{rise}{run} \qquad slope = \frac{y_2 - y_1}{x_2 - x_1}$$

- Describe the slope of each of the following



Negative slope

Undefined/
No slope

Positive slope

Zero/0 slope