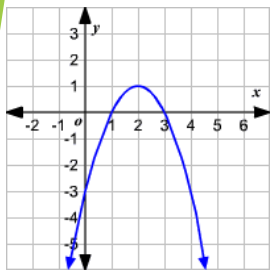
Created by Jackson Powell

Warm Up $(1000 - 70) \div 100 - .01$



1. What is the domain and range of the function?
2. What is the value of f(3)?
3. What is the value of x when f(x) = 0?
4. Calculate the problem in the date.

Check Homework

Rate of Change

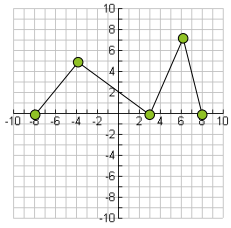
- The **rate of change** is the ratio of the change of one quantity to a change in another quantity.
- Example:

  - The table shows the amount of water evaporating from a swimming pool on a hot day. Find the rate of change in gallons with respect to time.

Time (hours)	2	6	12
Gallons evaporated	4.5	13.5	27

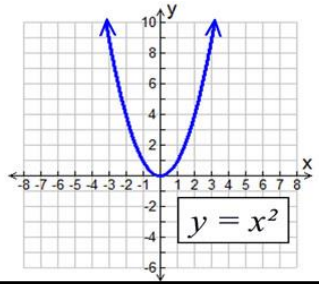
Rate of Change

- Where is the greatest rate of change on the graph? What is the value?



Rate of Change

- What is the rate of change for this graph?



What kind of function do you find slope for?

- We only find slope for linear functions
- The slope of a line does not change no matter where you find it on the line.
- This is called constant rate of change

What do we do for other types of functions?

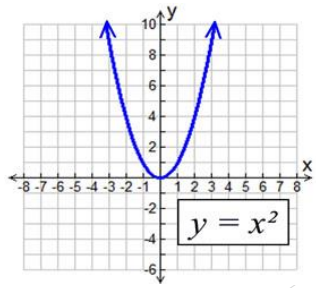
- Find the average rate of change in a specific interval. (It will change for each different interval!)

https://www.youtube.com/watch?v=lQRiw264bnI

(start at 1:18)

Example 1

- Find the average rate of change for the function on the interval from x= 0 to x = 2.



Average Rate of Change

- The **average rate of change** between any two points $(x_1, f(x_1))$ and $(x_2, f(x_2))$ is the change of y over the change in x at the two endpoints of the interval.

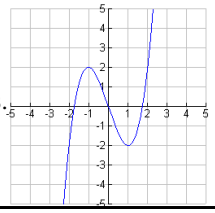
$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad becomes \quad \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

Example 2

- Find the average rate of change for $f(x) = x^3 - 3x$ on the interval from x= -2 to x = 0.

$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{f(0) - f(-2)}{0 - (-2)} = \frac{0 - (-2)}{2} = \frac{2}{2} = 1$$

Find the average rate of change for $f(x) = x^3 - 3x$ on the interval from x= 2to x = 3.



Group Work

- Now you will work with your groups on the average rate of change worksheet!