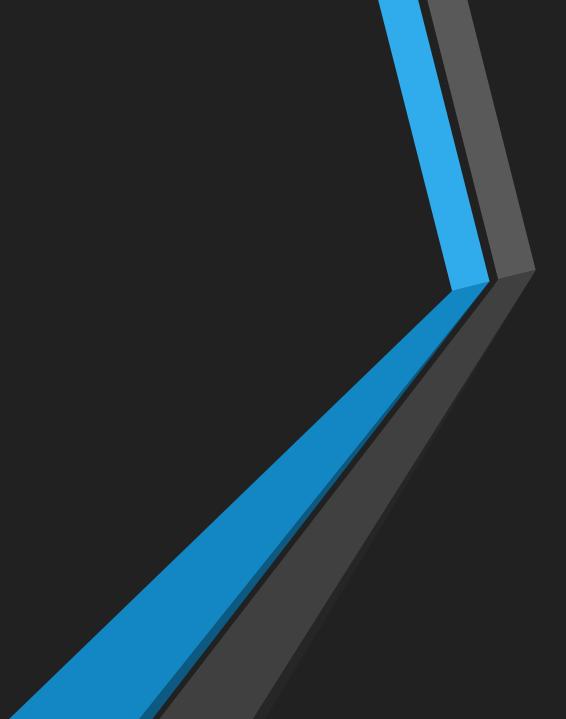
# f(x) Function Transformations

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#### **Bell Ringer**

What do we know about a f(x) graph?

#### The graph is linear

The graph has slope, which is rise/run • Positive, Negative, Undefined, or Zero

They have x-intercepts and y-intercepts

Graph is continuous and one-to-one

### a\*f(x)

- What did you notice about the graph based on slider movements?
- What function does a serve?
  - a affects the slope of the graph
  - When a positive, we have a positive slope
    The greater the number, the steeper the line
    When a is negative, we have a negative slope
    The lesser than number, the steeper the line
- Let's model this.

Let a = -4. = (-4)\*f(x)= -4 f(x)-We have a negative slope of -4.

Let a= 4. = (4)\*f(x) = 4 f(x) -We have a positive slope of 4.

# f(bx)

- What did you notice about the graph based on slider movements?
- What function does a serve?
  - b affects the slope of the graph
  - When b is positive, we have a positive slope
    - The greater the number, the steeper the line
  - When b is negative, we have a negative slope
    - The lesser than number, the steeper the line
- Let's model this.

Let a = -4. = (-4)\*f(x)= -4 f(x)-We have a negative slope of -

4.

Let a = 4. = (4)\*f(x)= 4 f(x)-We have a positive slope of 4.

- What did you notice about the graph based on slider movements?
- What function does c serve?
  - O c shifts the graph

When c is negative, the graph shifts to the left on the x-axis

When c is positive, the graph shifts to the right on the x-axis

Let's model this. Notice that the equation is f(x-c), with a minus sign.

= f(x-(-4)) = f(x+4) -Notice the signs flip. - Our graph is shifting 4 units to the right on the x-axis.

Let c = -4.

Let c= 4. = f(x-(4)) = f(x-4) -Notice the signs flip. - Our graph is shifting 4 units to the left on the x-axis.

# f(x)+d

- What did you notice about the graph based on slider movements?
- What function does d serve?
  - O d shifts the graph

When d is negative, the graph shifts up on the y-axis

When d is positive, the graph shifts down on the y-axis

Let's model this. Notice that the equation is f(x)+d, with a plus sign.

Let d= -4. = f(x)+(-4) = f(x)-4 -Our graph is shifting down 4 units on the y-axis. Let d= 4. = f(x)+ (4) = f(x)+4 -Our graph is shifting up 4 units on the y-axis.

#### ExitTickets

 What were some similarities or differences you noticed in the four transformation functions to the f(x) graph?

