f(x) Function Transformations

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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.

f(x-c)

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

Let c= -4.
= 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.
= 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?
  - 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.

Exit Tickets

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