ALGEBRA RH

Essential Question: What are transformations and how can we apply them to functions? ***Day 2***
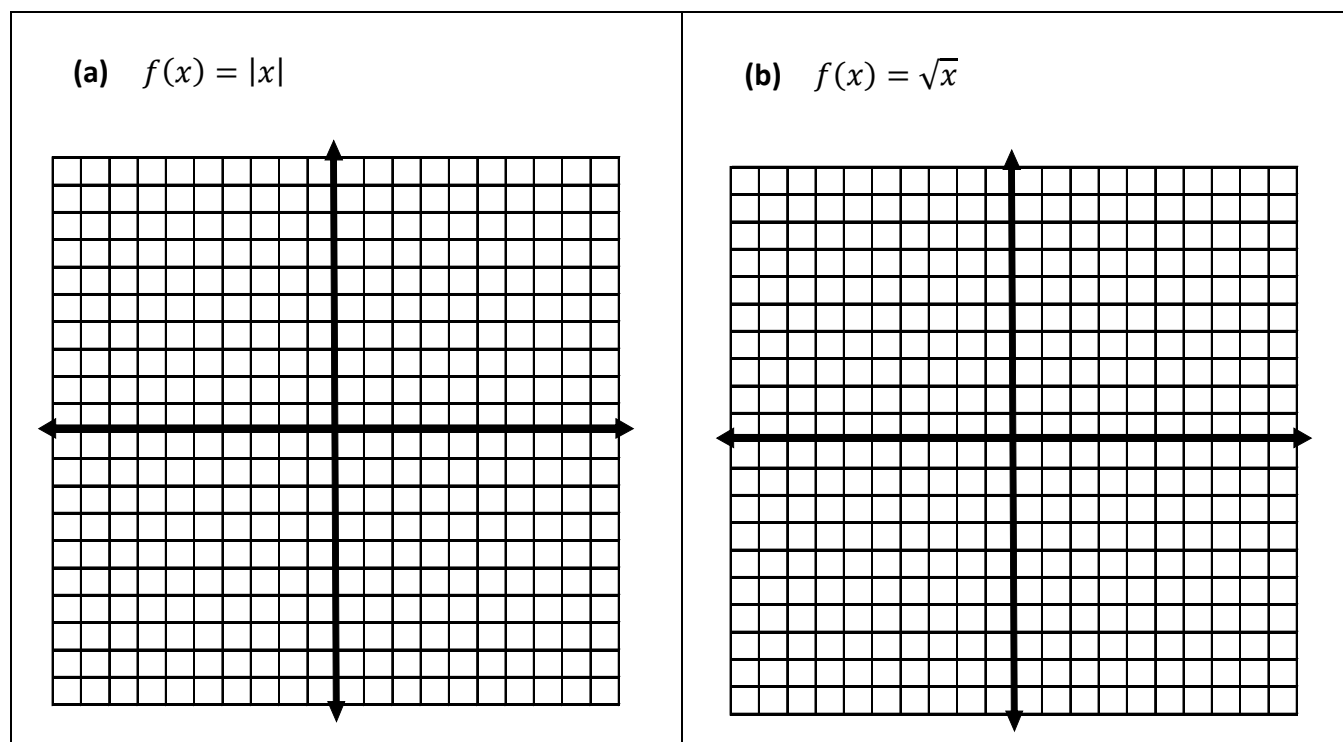
Do Now:

Given a function $f(x)$, describe the transformation if $g(x) = f(x - r) + s$

Today we are going to learn how to **Stretch/Compress and Reflect** functions.
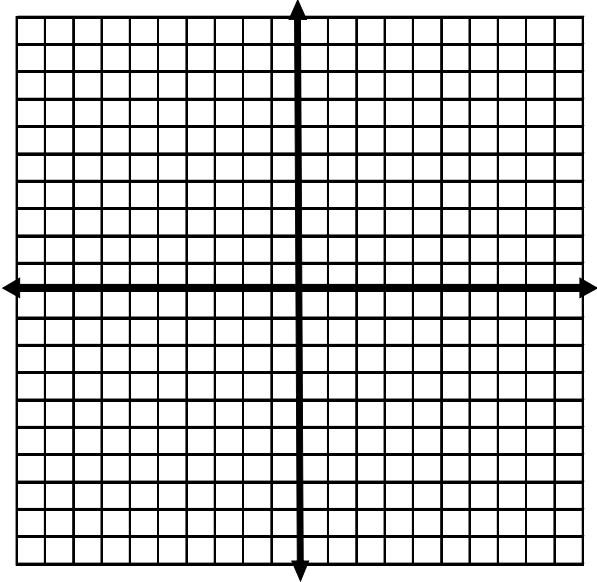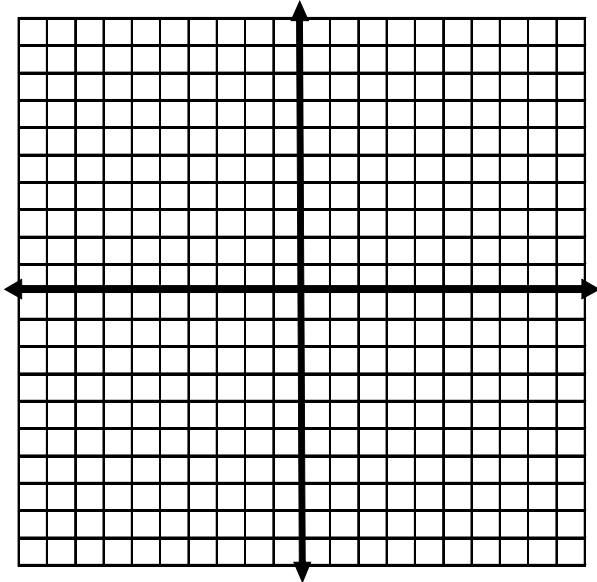
A stretch/compression or reflection happens when we multiply values to our given parent function.

1. In the same coordinate plane, graph the parent function $f(x)$ and the new functions $y = a \cdot f(x)$ for $a = \frac{1}{4}$ and $a = 2$

(a) $f(x) = |x|$

(b) $f(x) = \sqrt{x}$

Function Notation	Type of transformation
$a \cdot f(x)$ if $a > 1$	
$a \cdot f(x)$ if $0 < a < 1$	

2. In the same coordinate plane, graph the parent function $f(x)$ and the new function $y = -f(x)$
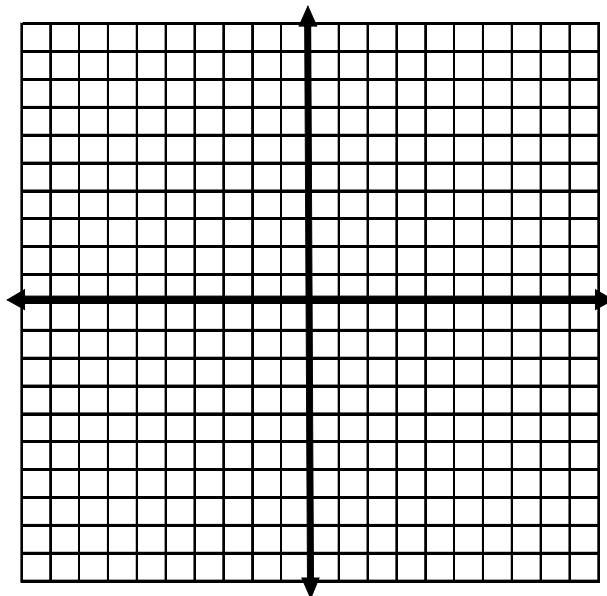
(c) $f(x) = x^2$	**(d)** $f(x) = x^3$

Function Notation	Type of transformation
$-f(x)$	

Practice Problem Set

1. Given the function $f(x)$ and $g(x) = 3f(x) + 6$, describe the transformation.

2. Given the function $f(x)$ and $g(x) = -\frac{1}{3}f(x - 1) - 2$, describe the transformation.

3. Given the function $f(x) = \sqrt{x}$ and $g(x) = -5\sqrt{x}$, determine if they will have the same domain and range. Explain your answer.

* 4. Given the function $y = |x - 3| + 2$, describe the transformation to the new function $y = |x - 5| - 1$

5. On the set of axes, graph both functions. Describe the transformation from the parent function.

$$f(x) = |x| \quad \text{and} \quad g(x) = -2|x - 1| + 3$$

TRANSFORMATION RULES FOR FUNCTIONS	
EQUATION	**HOW TO OBTAIN THE GRAPH**
$y = f(x) + k$	
$y = f(x) - k$	
$y = f(x + h)$	
$y = f(x - h)$	
$y = af(x) \ (a > 1)$	
$y = af(x) \ (0 < a < 1)$	
$y = -f(x)$	