

ALGEBRA RH

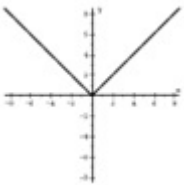
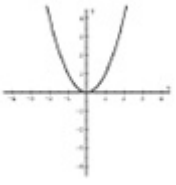
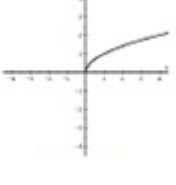
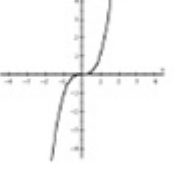
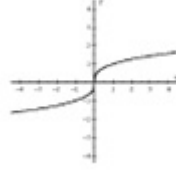
Essential Question: What are transformations and how can we apply them to functions? **Day 1**

Do Now:

The function, $f(x)$, is shown below. Determine the value of $g(4)$, given that $g(x) = 5f(x) + 1$

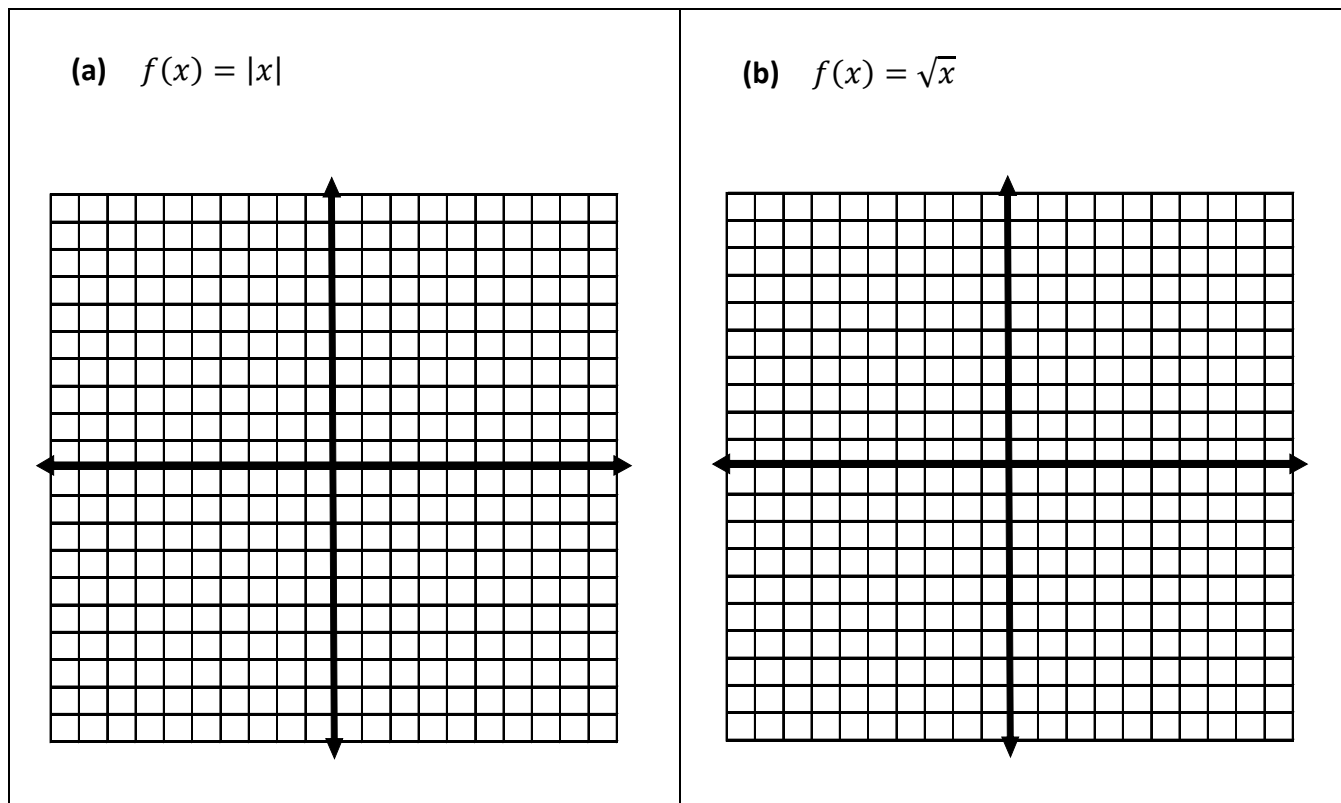
x	$f(x)$
2	-8
3	-1
4	3
5	7

Transformation: A mathematical process that applies a change to a **parent function** to produce another function with similar characteristics. Here are the parent functions we will be working with.

FUNCTION	$f(x) = x $	$f(x) = x^2$	$f(x) = \sqrt{x}$	$f(x) = x^3$	$f(x) = \sqrt[3]{x}$
FUNCTION NAME					
GRAPH					
DOMAIN					
RANGE					
INCREASING					
DECREASING					
x -INTERCEPTS					
y -INTERCEPTS					
MAX/MIN					
END BEHAVIOR					

Today we are going to learn how to **TRANSLATE** functions. A translation is a horizontal or vertical shift. This happens when we add/subtract values to our given parent function.

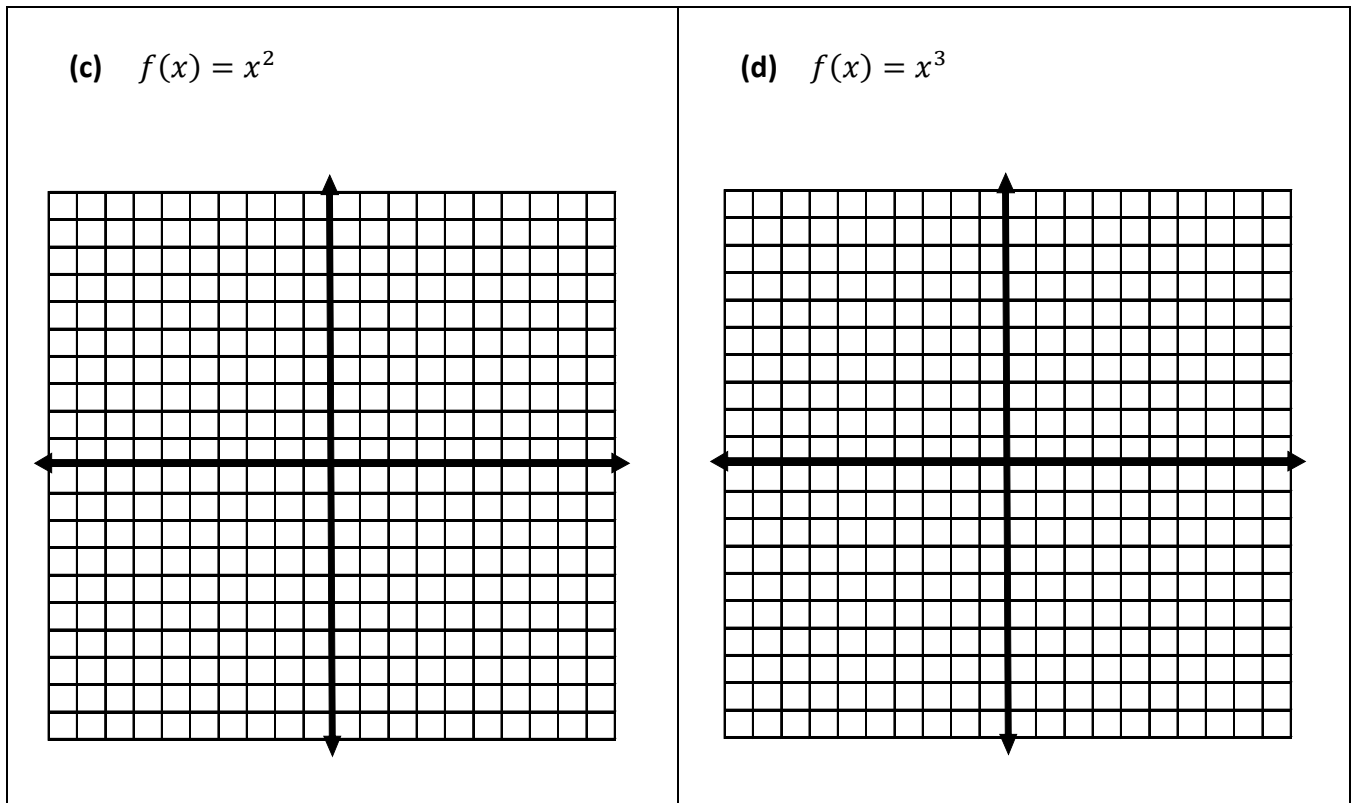
1. In the same coordinate plane, graph the parent function $f(x)$ and the new functions $y = f(x) + k$ for $k = 3$ and $k = -4$.



Use the results from above to describe the relationship between the graph of $f(x)$ and the two new functions. Discuss some of the key concepts such as domain, range, intercepts, etc...

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

2. In the same coordinate plane, graph the parent function $f(x)$ and the new functions $y = f(x + h)$ for $h = 2$ and $h = -3$.



Use the results from above to describe the relationship between the graph of $f(x)$ and the two new functions.

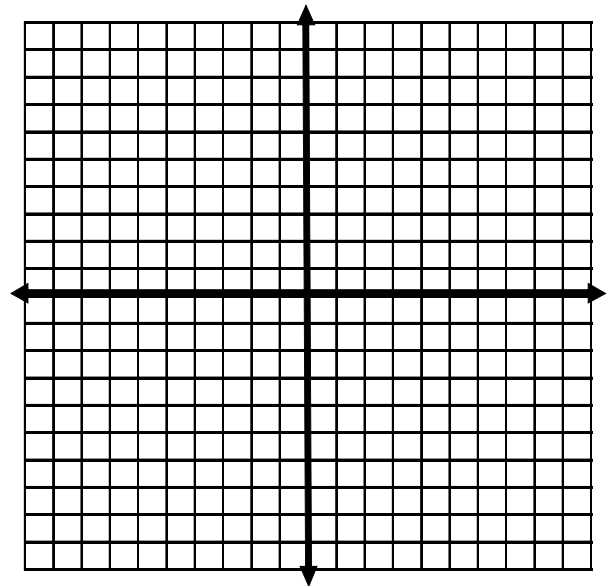
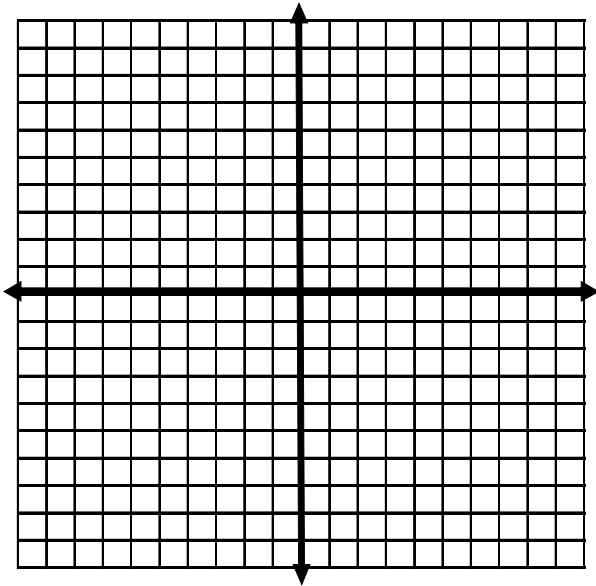
Function Notation	Type of transformation
$f(x + h)$	
$f(x - h)$	

Practice Problem Set

1. Given the function $f(x)$ and $(x) = f(x - 5) + 6$, describe the transformation.
2. On the set of axes, graph both functions without a table of values. Use your knowledge of parent functions and transformations.

a) $f(x) = |x|$ and $g(x) = |x + 1| - 5$

b) $f(x) = \sqrt[3]{x}$ and $g(x) = \sqrt[3]{x} + 4$



3. Using your knowledge of the parent function $f(x) = \sqrt{x}$, state the domain and range of a new function given by $g(x) = \sqrt{x - 7} + 2$
4. Using your knowledge of the parent function $f(x) = x^2$,
 - a. State the vertex
 - b. Given $g(x) = (x + 3)^2 - 1$, describe the transformation from the parent function
 - c. State the vertex of $g(x)$