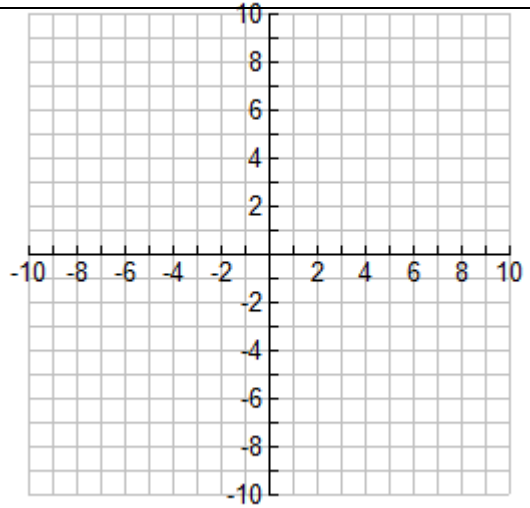
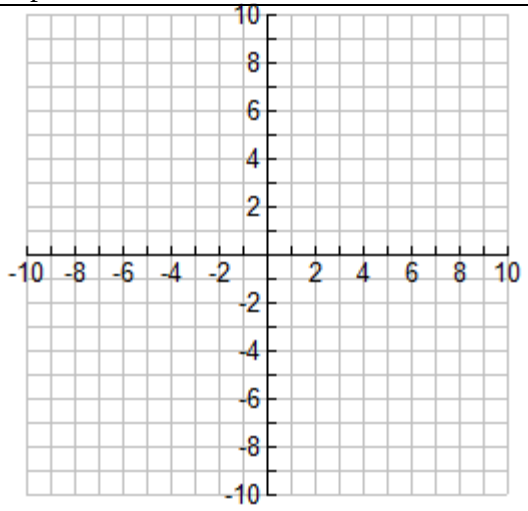
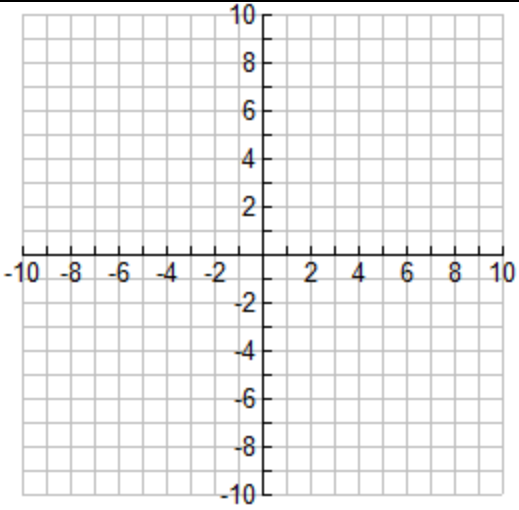
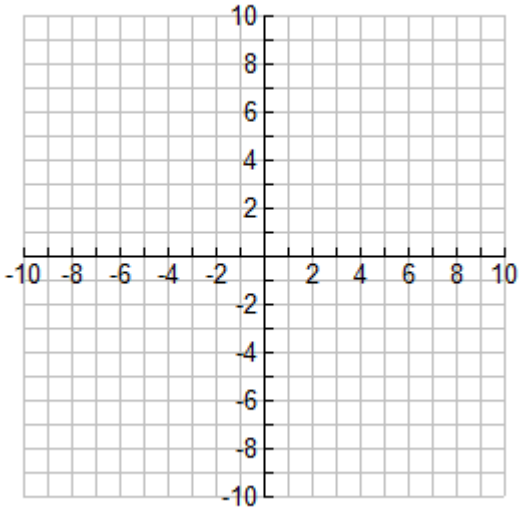
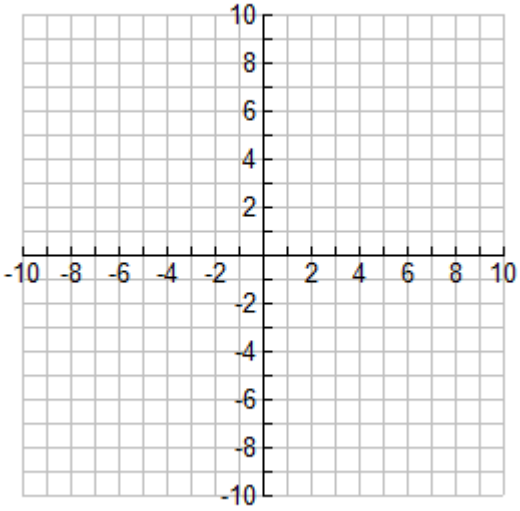
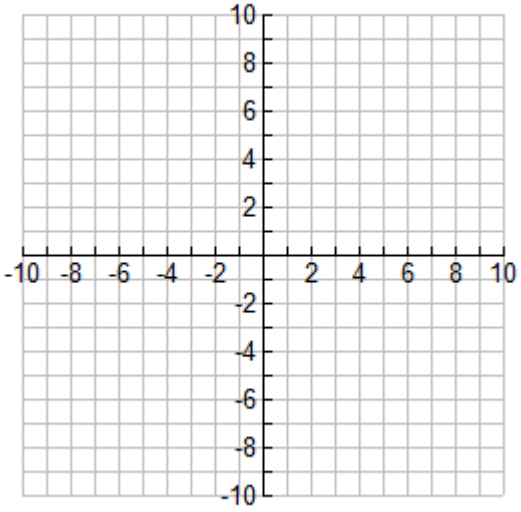
Algebra 1 Name _____ Date _____

Unit 1- Introduction to Graphing- NOTES G

Vertical Transformations: Movements Up & Down → Change in Y → Change in Outputs

Function:	**y = f(x)**	**y = f(x) + 8** **What is the impact of adding 8 to the output?**	**y = f(x) – 3** **What is the impact of subtracting 3from the output??**
Table:	<table><tr><th>x</th><th>f(x)</th></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>3</td></tr></table>	<table><tr><th>x</th><th>f(x)</th><th>**f(x) + 8**</th></tr><tr><td>0</td><td>0</td><td></td></tr><tr><td>1</td><td>1</td><td></td></tr><tr><td>2</td><td>2</td><td></td></tr><tr><td>3</td><td>3</td><td></td></tr></table> Using the same inputs, what are the new outputs?	<table><tr><th>x</th><th>f(x)</th><th>**f(x) - 3**</th></tr><tr><td>0</td><td>0</td><td></td></tr><tr><td>1</td><td>1</td><td></td></tr><tr><td>2</td><td>2</td><td></td></tr><tr><td>3</td><td>3</td><td></td></tr></table> Using the same inputs, what are the new outputs?
Graph:		 What impact do the new outputs have on the graph?	 What impact do the new outputs have on the graph?
Observation(s):			

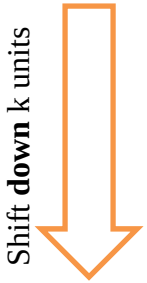
Horizontal Transformations: Movements Left & Right → Change in X → Change in Inputs

Function:	**y = f(x)**	**y = f(x + 8)** **What is the impact of adding 8 to the input?**	**y = f(x – 3)** **What is the impact of subtracting 3 from the input?**
Table:	<table><tr><th>x</th><th>f(x)</th></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>3</td></tr></table>	<table><tr><th>x</th><th>x + 8</th><th>f(x)</th></tr><tr><td>-8</td><td>0</td><td>0</td></tr><tr><td>-7</td><td>1</td><td>1</td></tr><tr><td></td><td>2</td><td>2</td></tr><tr><td></td><td>3</td><td>3</td></tr></table> Keeping the same outputs, what value must x take on to account for the change in inputs?	<table><tr><th>x</th><th>x - 3</th><th>f(x)</th></tr><tr><td>3</td><td>0</td><td>0</td></tr><tr><td>4</td><td>1</td><td>1</td></tr><tr><td></td><td>2</td><td>2</td></tr><tr><td></td><td>3</td><td>3</td></tr></table> Keeping the same outputs, what value must x take on to account for the change in inputs?
Graph:		 What impact do the new (adjusted) x-values have on the graph?	 What impact do the new (adjusted) x-values have on the graph?
Observation(s):			

Vertical Transformations of y = f(x)

y = f(x) + k

y = f(x) – k



Horizontal Transformations of y = f(x)

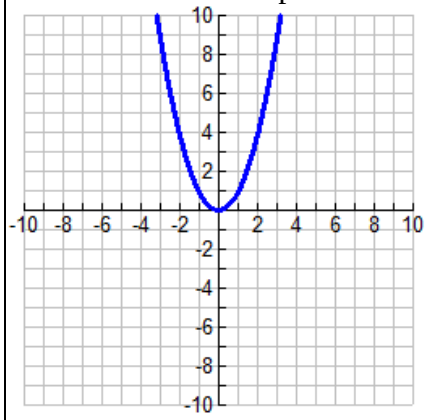
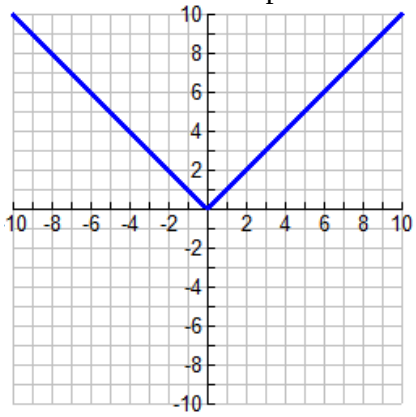
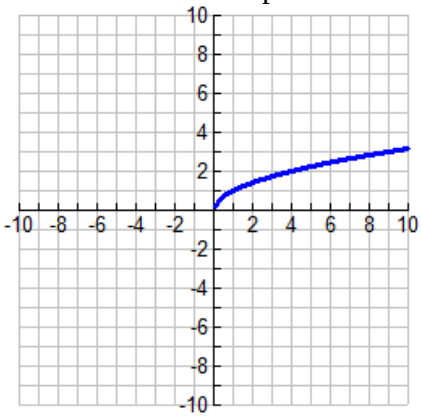
y = f(x – h)

y = f(x + h)

Given the parent function y = f(x) describe the transformation(s) in the spaces provided below.

Transformation	Horizontal	Vertical
y = f(x) + 2		
y = f(x – 5)		
y = f(x + 1) + 7		
y = f(x – 1) – 9		
y = f(x + 5) – 2		
y = f(x) – 10		
y = f(x + 8)		
y = f(x – 2) + 3		

The parent function, f(x), may vary as seen in the table below. We are not restricted to linear functions.
In each of the rows below, describe the transformation(s) that occur on the parent function.

Parent Function Graph:	Parent Function Graph:	Parent Function Graph:
		
Parent Function: $y = x^2$	**Parent Function: $y = \lvert x \rvert$**	**Parent Function: $y = \sqrt{x}$**
$y = x^2 + 5$	$y = \lvert x \rvert - 7$	$y = \sqrt{x} + 6$
$y = (x - 2)^2$	$y = \lvert x + 10 \rvert$	$y = \sqrt{x + 9}$
$y = (x + 1)^2 - 3$	$y = \lvert x + 4 \rvert - 8$	$y = \sqrt{x - 1} + 4$
$y = (x - 4)^2 - 6$	$y = \lvert x - 5 \rvert + 3$	$y = \sqrt{x + 2} - 1$