CCSS Advanced Algebra 3 Card Sort: Transformations Check-In Name_____

1. Identify each transformation (or transformations) below. Be specific.

Transformations:		
HORIZONTAL TRANSLATION (Left or Right)	VERTICAL TRANSLATION (Up or Down)	VERTICAL REFLECTION
HORIZONTAL REFLECTION	HORIZONTAL DILATION (Stretch or Compress)	VERTICAL DILATION (Stretch or Compress)

a. $f(x)+10$ Translate Up 10

b. $f(x-3)$ Translate Right 3

c. $f(x+8)$ Translate Left 8

d. $3f(x)$ Dilate vertically 3 Stretch

e. $-f(x)$ Reflect Vertically

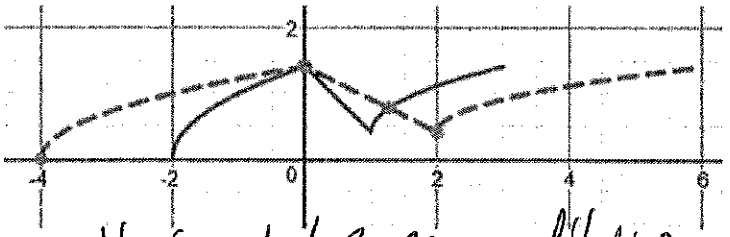
f. $f(0.5x)$ Stretch Horizontally by 2

g. $f(-x)$ Reflect Horizontally

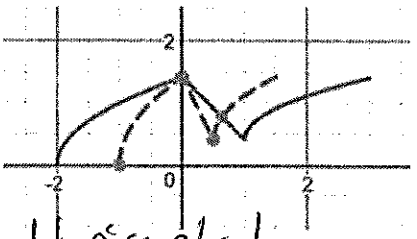
h. $f(2(x-1))$ Shift right 1, Compress Horizontally by 2.

i. $f(x+3)+3$ Shift Left 3, up 3.

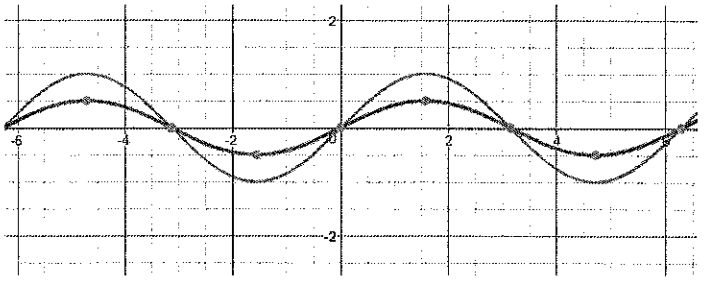
2. Which image(s) below show a horizontal dilation and which show(s) a vertical dilation? How can you tell?



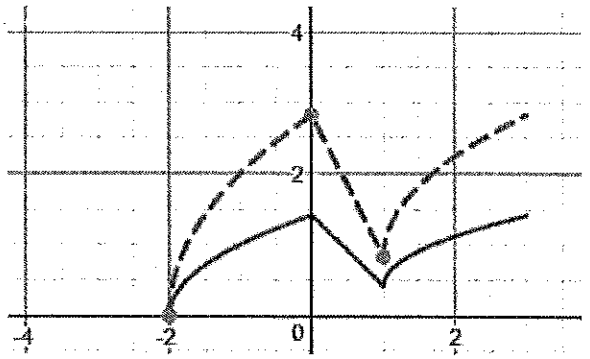
Horizontal compress dilation



Horizontal



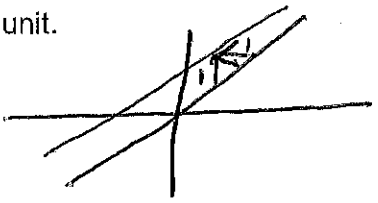
Vertical



Vertical

3. Let the Parent LINEAR Function be $g(x) = x$.

a. Explain GRAPHICALLY why a vertical translation up 1 unit results in the same function as a horizontal translation left 1 unit.

Because  The 2 parallel lines are 1 unit apart. 1 unit left and 1 unit up are the same for the line

b. Will a VERTICAL REFLECTION of $g(x) = x$ look differently than a HORIZONTAL REFLECTION of $g(x) = x$? Explain how you know.

They will look the same.
Flipping left & right is the same as up & down for the line.

c. Is $h(x) = 3x$ a VERTICAL or HORIZONTAL DILATION of $g(x) = x$? Explain how you know.

Vertical stretch of 3 OR Horizontal compression of 3.

4. Consider the Quadratic Function $n(x) = x^2 + 10x + 21$.

a. Factor to show that $n(x) = (x + \#)(x + \#)$.

	x	7
x	x^2	$7x$
3	$3x$	21

$(x+7)(x+3)$

b. The VERTEX is halfway between the x-intercepts. Find the x- and y-coordinates of the vertex.

$x = -7, \quad x = -3$

$V = \frac{-7+-3}{2} = \frac{-10}{2} = -5$

Plug in $n(-5) = (-5+7)(-5+3)$

$(2)(-2)$

$n(-5) = -4$

$V: (-5, -4)$

c. What transformation(s) on $f(x) = x^2$ result in $n(x)$? Be specific.

Shift left 5 & down 4

d. Evaluate $n(0)$. What does $n(0)$ tell you about the GRAPH of $n(x)$?

$n(0) = 0^2 + 10(0) + 21$

$n(0) = 21$ ← This is the y-intercept.

e. Find the VERTEX of $n(x+1) - 3$.

Old vertex: $(-5, -4)$

Transformations: Left 1, Down 3

New vertex: $(-6, -7)$