

Transformations of any graph: $y = a \cdot f(x - h) + k$

Name _____

a: Stretch or shrink **vertically** only (Multiply only the y-coordinate by the scale factor.)

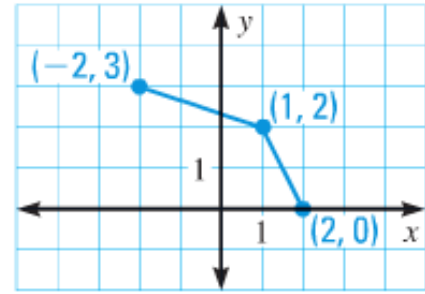
(If $a < 0$, then **reflect** the resulting graph in (over) the x-axis.) (Change the y-coordinate to its opposite.)

h: translate the points h units horizontally (Add h to the x-coordinate.)

(be careful.... $(x - 3)$ would be a movement to the right while $(x + 3)$ would be a movement to the left)

k: translate the points k units vertically (Add k to the y-coordinate.)

($+ 8$ would be a movement up and $- 8$ would be a movement down.)



1. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = 3 \cdot f(x - 4) + 2$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate.)	Vertical Shift? (Add k to the y-coordinate.)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

2. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = -f(x + 1) - 4$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate.)	Vertical Shift? (Add k to the y-coordinate.)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

3. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = f(x + 2) - 3$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate.)	Vertical Shift? (Add k to the y-coordinate.)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

4. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = f(x - 4) + 1$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate .)	Vertical Shift? (Add k to the y-coordinate .)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

5. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = \frac{1}{2} \cdot f(x)$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate .)	Vertical Shift? (Add k to the y-coordinate .)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

6. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = -3 \cdot f(x)$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate .)	Vertical Shift? (Add k to the y-coordinate .)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

7. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = -f(x - 1) + 4$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate .)	Vertical Shift? (Add k to the y-coordinate .)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				

8. Use the graph of $f(x)$ above to find the coordinates of the new function: $y = 2 \cdot f(x + 3) - 1$

(x, y)	Vertical Stretch or shrink? (Multiply y-coordinate only.)	Reflect? (Change y-coordinate only to its opposite)	Horizontal Shift? (Add h to the x-coordinate .)	Vertical Shift? (Add k to the y-coordinate .)
$(-2, 3)$				
$(1, 2)$				
$(2, 0)$				