

SM2 Lesson 4-2 *HANDOUT* (Squaring) Function

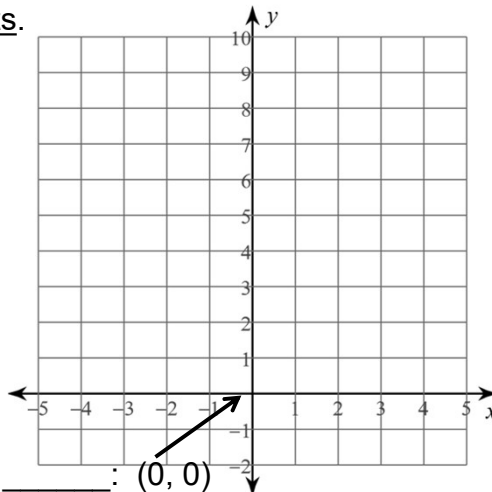
Using the input values and the “parent function” of the quadratic family, calculate the corresponding output values (fill in the table) and graph the points.

x	f(x)
-3	9
-2	
-1	
0	
1	
2	
3	

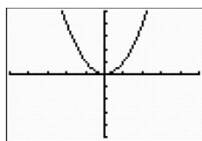
$$f(x) = x^2$$

$$f(-3) = (-3)^2$$

$$\rightarrow f(-3) = 9$$

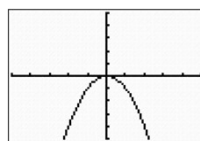


We say the function has been _____.



$$y = x^2$$

x	f(x)
-2	4
-1	1
0	0
1	1
2	4



$$g(x) = -x^2$$

x	g(x)
-2	
-1	
0	
1	
2	

Multiplying the parent function by _____

 _____.

Graph: Parent function has been _____

Vertex: (0, 0)
 $y = x^2$

x	y
-2	4
-1	1
0	0
1	1
2	4

$y = x^2 + 2$

x	y
-2	
-1	
0	
1	
2	

Fill in the table for the other equation and graph the points.

Fill in the second table.

$y = x^2$

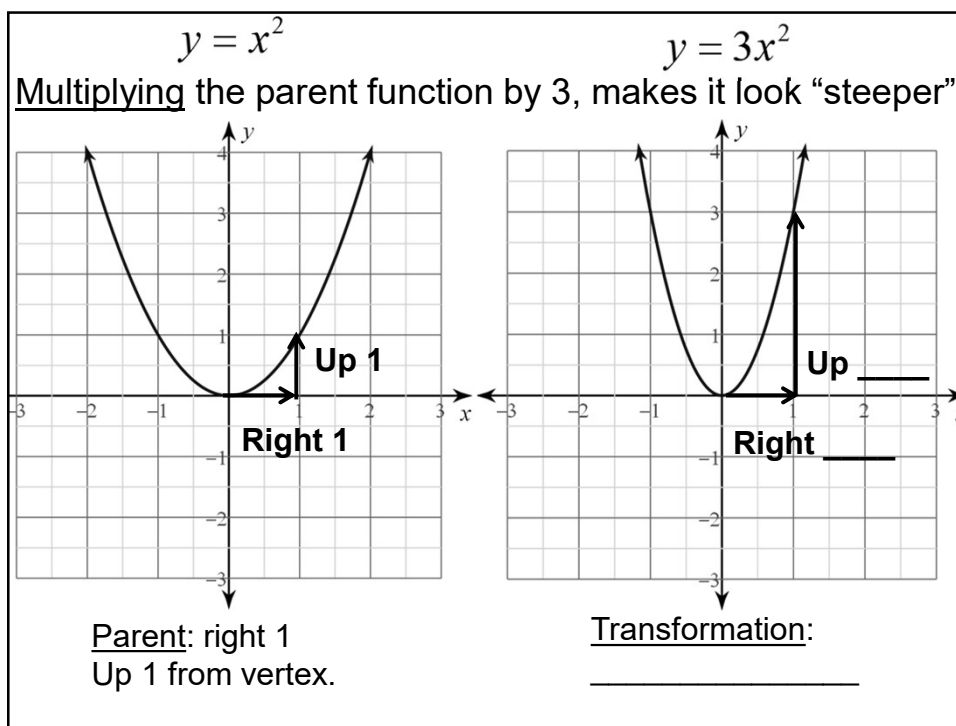
x	y
-2	4
-1	1
0	0
1	1
2	4

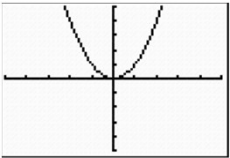
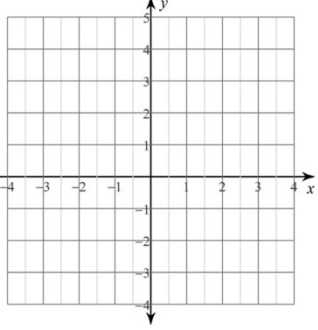
$y = 3x^2$

x	y
-2	
-1	
0	
1	
2	

For the same input values, the output values have been _____.

We say the function has been “_____”.



Fill in the 2nd table.

$f(x) = x^2$

x	f(x)
-2	4
-1	1
0	0
1	1
2	4

$g(x) = (x - 1)^2$

x	g(x)
-2	
-1	
0	
1	
2	
3	

Replacing 'x' in the parent function with 'x - 1' causes the graph to _____

Let's generalize the transformations

$$f(x) = x^2 \qquad y = (-1)a(x-h)^2 + k$$

Reflection
VSF
left/right
up/down

across x-axis

$$y = -2(x-3)^2 + 4 \quad \underline{\hspace{4cm}}$$

$$y = 3(x+5)^2 - 6 \quad \underline{\hspace{4cm}}$$

In order to graph the equation:

- 1) Move the vertex left/right and up/down
- 2) From the vertex move right 1, then up/down by the VSF.

Your Turn:

Describe the transformation to the parent function: $y = x^2$

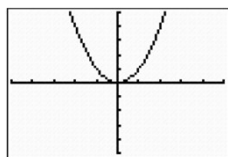
$$y = x^2 - 4 \quad \underline{\hspace{4cm}}$$

Describe the transformation to the parent function: $y = x^2$

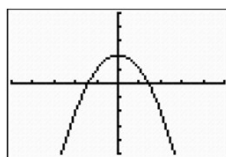
$$y = x^2 + 5 \quad \underline{\hspace{4cm}}$$

These effects accumulate

Describe the transformation to the parent function:



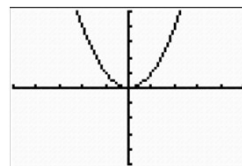
$$f(x) = x^2$$



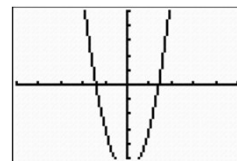
$$g(x) = -x^2 + 2$$

These effects accumulate

Describe the graphical transformation to the parent function:



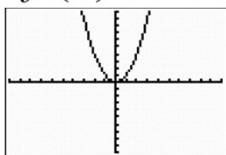
$$f(x) = x^2$$



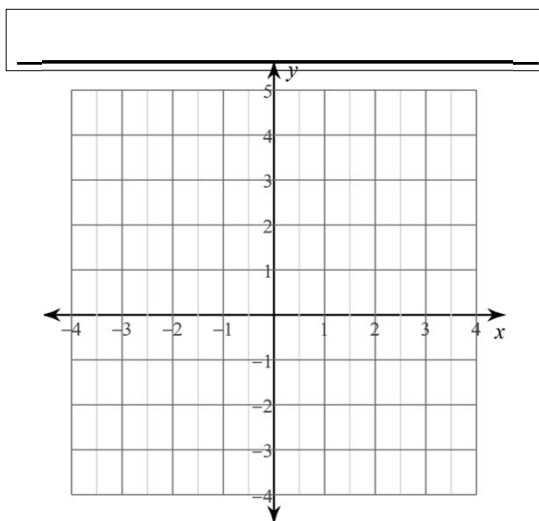
$$g(x) = 3x^2 - 6$$

Describe the transformation to the parent function, then graph the function.

$$f(x) = x^2$$

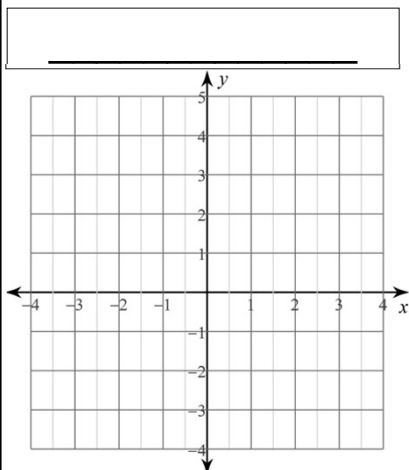


$$g(x) = (x + 5)^2 + 3$$

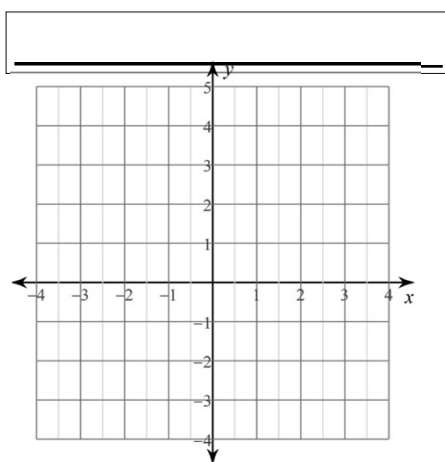


Describe the transformation to the parent function then graph the function.

$$k(x) = 2(x - 1)^2$$

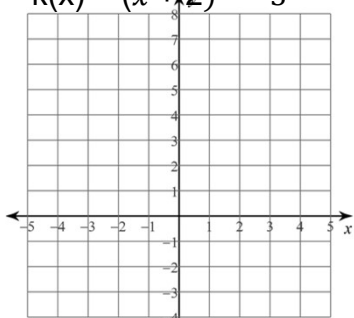


$$j(x) = -\frac{1}{2}(x + 3)^2 + 4$$

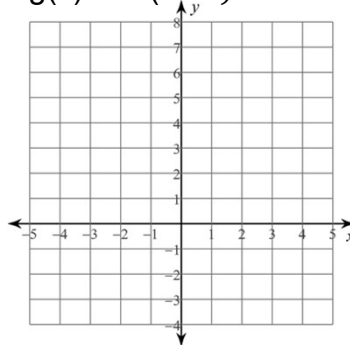


Graph the function:

$$k(x) = (x + 2)^2 - 3$$



$$g(x) = -2(x - 3)^2 + 4$$



What is the equation that has been graphed?

