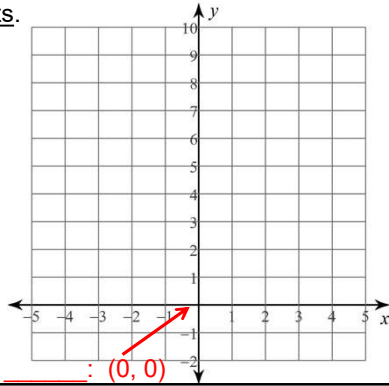


SM3-A Lesson 1-3 *HANDOUT* (Squaring) Function

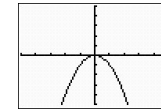
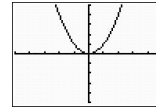
Using the input values and the "parent function" of the quadratic family, calculate the corresponding output values (fill in the table) and graph the points.

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 \_\_\_\_\_.



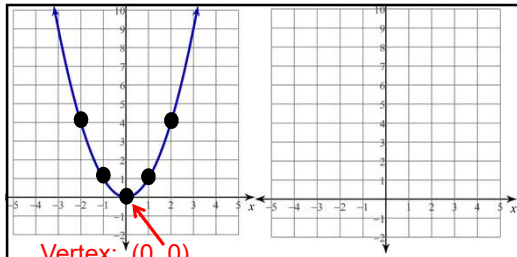
$y = x^2$

$g(x) = -x^2$

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

Multiplying the parent function by \_\_\_\_\_

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



Graph: Parent function has been \_\_\_\_\_

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

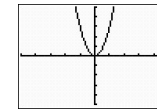
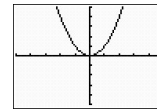
x	y
-2	4
-1	1
0	0
1	1
2	4

$y = x^2 + 2$

x	y
-2	
-1	
0	
1	
2	

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

Fill in the second table.



$y = x^2$

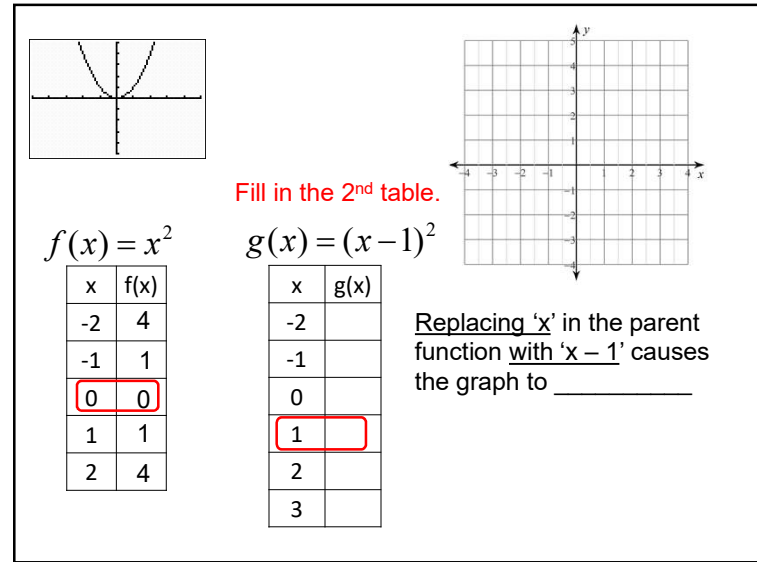
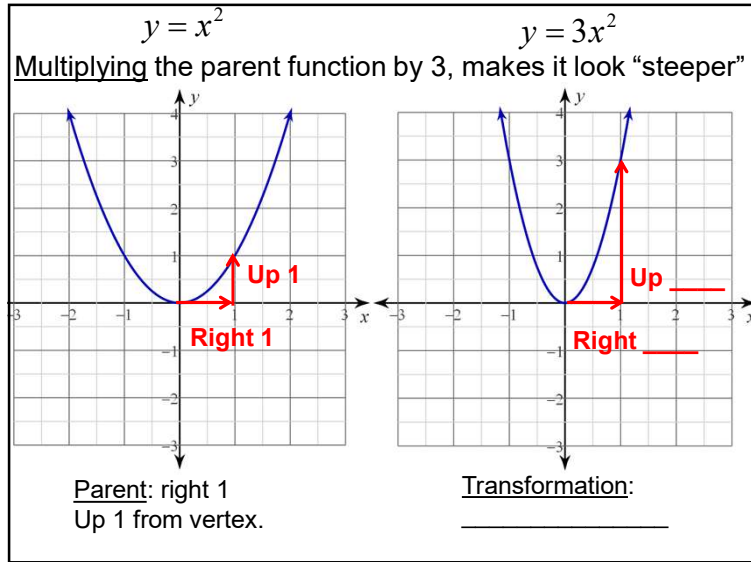
$y = 3x^2$

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

x	y
-2	
-1	
0	
1	
2	

For the same input values, the output values have been \_\_\_\_\_.

We say the function has been "\_\_\_\_\_".



**Let's generalize the transformations**

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

Reflection      ↗      ↖      ↖      ↗  
across x-axis      VSF      left/right      up/down

$y = -2(x-3)^2 + 4$       \_\_\_\_\_

$y = 3(x+5)^2 - 6$       \_\_\_\_\_

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:  $y = x^2$

$y = x^2 - 4$       \_\_\_\_\_

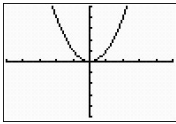
Describe the transformation to the parent function:  $y = x^2$

$y = x^2 + 5$       \_\_\_\_\_

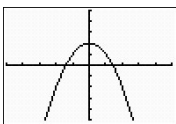
These effects accumulate

Describe the transformation to the parent function:

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$f(x) = x^2$



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

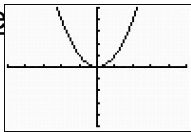
These effects accumulate

Describe the graphical transformation to the parent function:

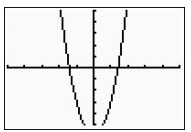
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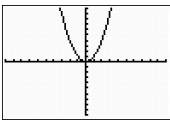
$f(x) = x^2$



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

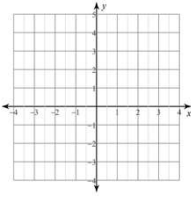
Describe the transformation to the parent function:

$f(x) = x^2$

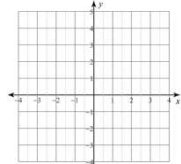


$k(x) = 2(x - 1)^2$

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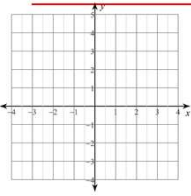
$g(x) = (x + 5)^2 + 3$




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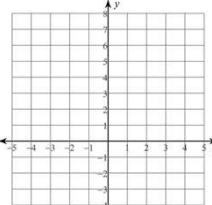
$j(x) = -\frac{1}{2}(x + 3)^2 + 4$

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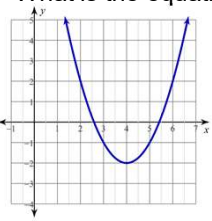


Interpret the transformation the graph the function

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



What is the equation that has been graphed?



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

