

Notes 2-7B Quadratic Functions and Transformations
Algebra II

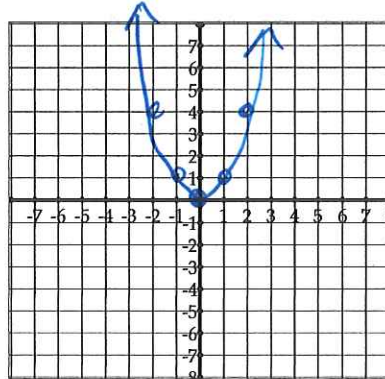
Name _____

Period _____

Parent Function: $f(x) = x^2$

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

Vertex: $(0, 0)$



Vertex form: $f(x) = a(x - h)^2 + k$

The vertex is located at (h, k)

Examples: List the transformations, label the vertex and graph each of the following:

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

Trans: 2 R & 3 ↑

parent

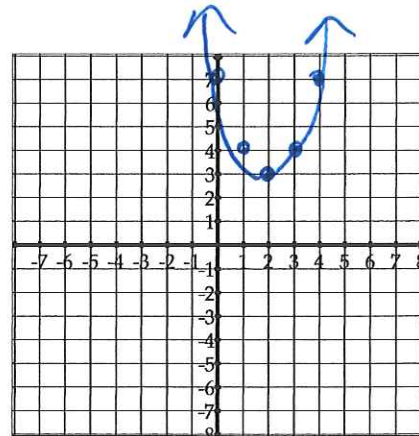
x	y
-2	4
-1	1
0	0
1	1
2	4

vertex: $(2, 3)$

transformation

$x+2$	$y+3$
0	7
1	4
2	3
3	4
4	7

← vertex



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

Trans: 3 L & 4 ↓

parent

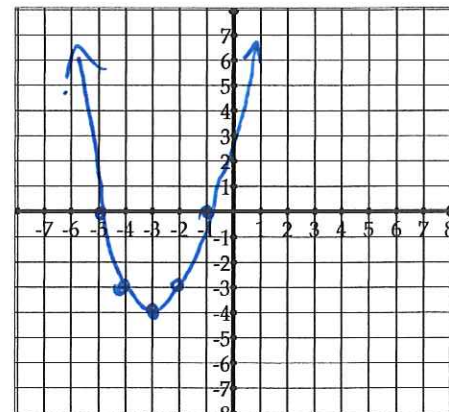
x	y
-2	4
-1	1
0	0
1	1
2	4

vertex: $(-3, -4)$

transformation

$x-3$	$y-4$
-5	0
-4	-3
-3	-4
-2	-3
-1	0

← vertex



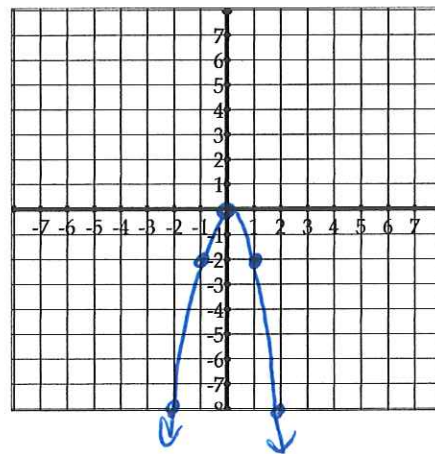
vert. stretch by 2

$f(x) = -2x^2$ Trans: vertical reflecta.

Parent vertex: (0,0)

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

x	-2y
-2	-8
-1	-2
0	0
1	-2
2	-8



$f(x) = \frac{1}{2}(x+4)^2$ Trans: 4L & vert. comp. 1/2

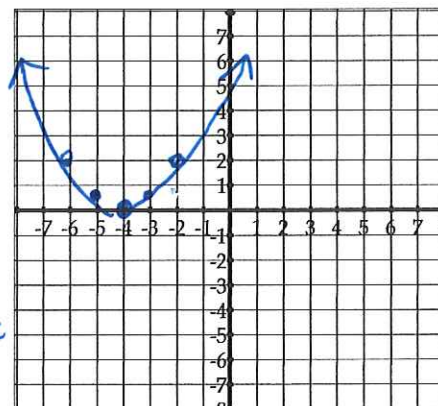
vertex: (-4,0)

Parent

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

x-4	1/2y
-6	2
-5	1/2
-4	0
-3	1/2
-2	2

← vertex



Given $f(x) = x^2$, let $g(x)$ be a transformation 4 units left, followed by a vertical stretch (scale factor of 2). Write the rule for $g(x)$.

$$f(x) = (x)^2 \rightarrow g(x) = 2(x+4)^2$$

Given $f(x) = x^2$, let $g(x)$ be a vertical compression (scale factor of 1/5) followed by a vertical shift 3 units up. Write the rule for $g(x)$.

$$f(x) = (x)^2 \rightarrow g(x) = \frac{1}{5}(x)^2 + 3$$

Given $f(x) = |x - 3|$, let $g(x)$ be a transformation 2 units right and 6 units up. Write the rule for $g(x)$.

$$f(x) = |x-3| \rightarrow g(x) = |x-3-2| + 6 = |x-5| + 6$$

Given $f(x) = |x|$, let $g(x)$ be a transformation 3 units left and 5 units down, then reflected across the x axis. Write the rule for $g(x)$.

$$f(x) = |x| \rightarrow g(x) = -|x+3| - 5$$