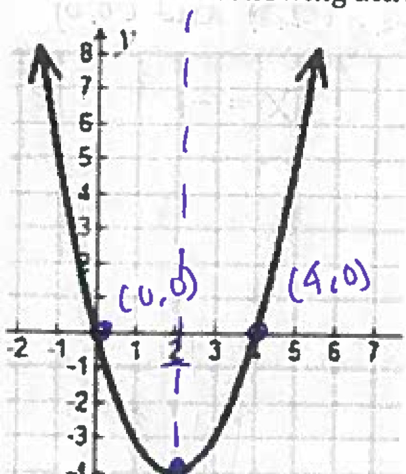
: KEY ______________ Date: __________ Period: __________

Test Review: Quadratic Graphs and Writing Quadratic Functions

Standard	What Student Can Do
Graphs of Quadratic Functions	I can… - Identify key attributes of a parabola: x-intercepts, zeros, solutions, roots, maximum value, minimum vale, vertex, y-intercept, equation for the axis of symmetry - Graph a quadratic function given an equation with the calculator - Finish graphing a parabola if given the vertex/axis of symmetry
Domain and Range of Quadratic Graphs	I can… - Determine the domain of a quadratic function (all real numbers) - Determine the range of all real numbers (depends on the vertex and if parabola is facing up or down) - Graph a quadratic function to determine the domain and range
Vertex Form	I can… - Graph a quadratic function given the equation in vertex form - Given a graph, write a quadratic function in vertex form using the vertex (h, k) and 'a' value - Given an equation in vertex form, determine the vertex and 'a' value
Effects of Change	I can… - Apply horizontal (left and right) shifts to a quadratic graph - Apply vertical (up and down) shifts to a quadratic graph - Apply reflections over the x-axis to a quadratic graph - Apply narrowing/widening of a quadratic graph - Explain in words how the quadratic graph is changing

Graphs of Quadratic Functions

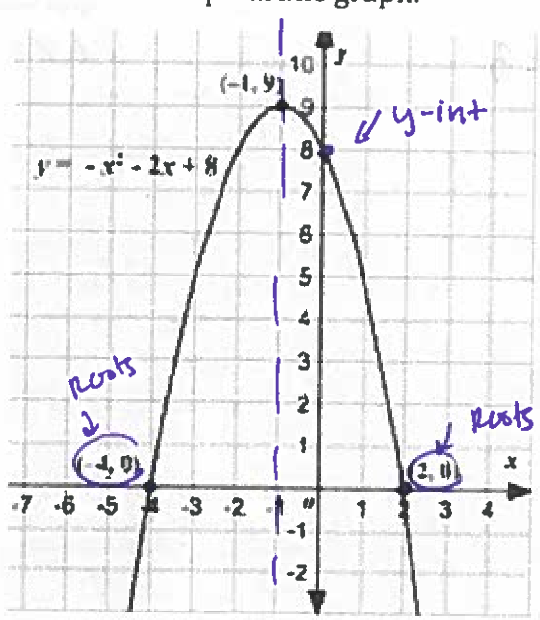
Determine the following attributes about each quadratic graph.



vertex: (2, −4)

Solutions: (0,0) and (4,0)

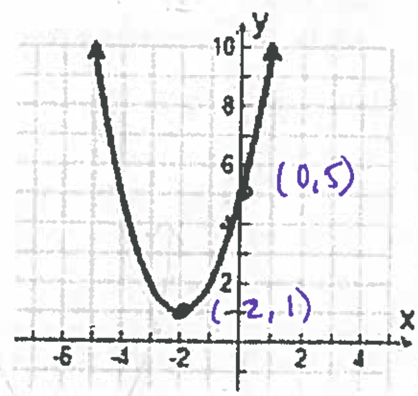
axis of symmetry: X=2



axis of symmetry: X=-1

y-intercept: (0,8)

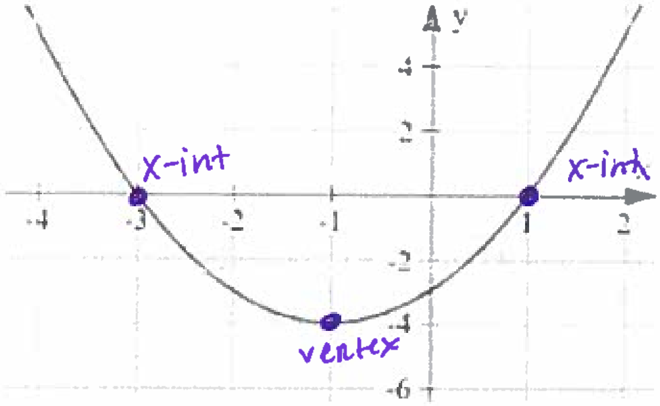
Roots: (-4,0) and (2,0)



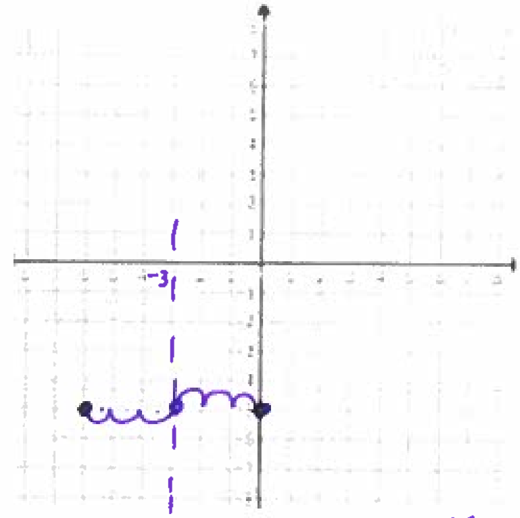
zeros: None

vertex: (-2,1)

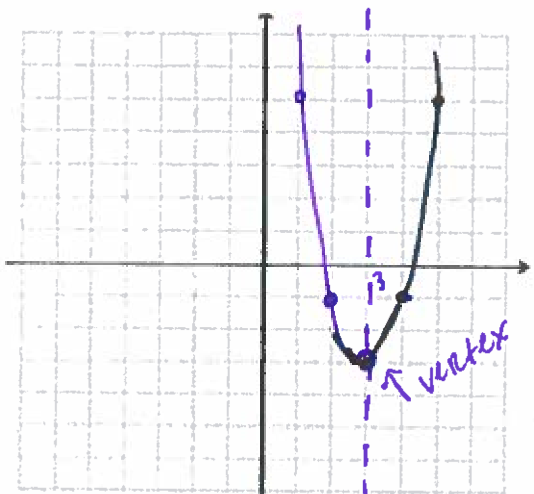
y-intercept: (0,5)



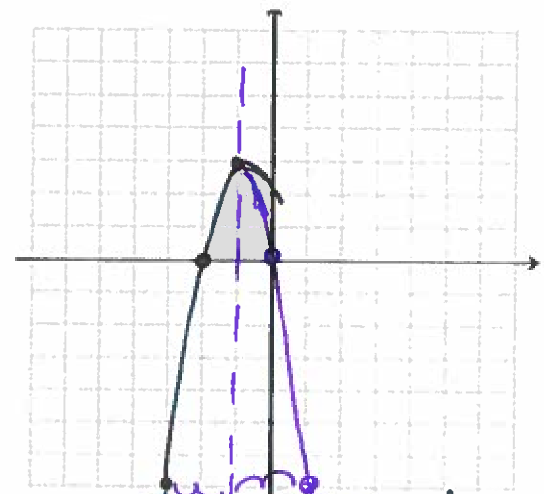
x-intercepts: (1,0) and (-3,0)
vertex: (-1,-4)



axis of symmetry: $x = -3$
y-intercept: (0,-5)

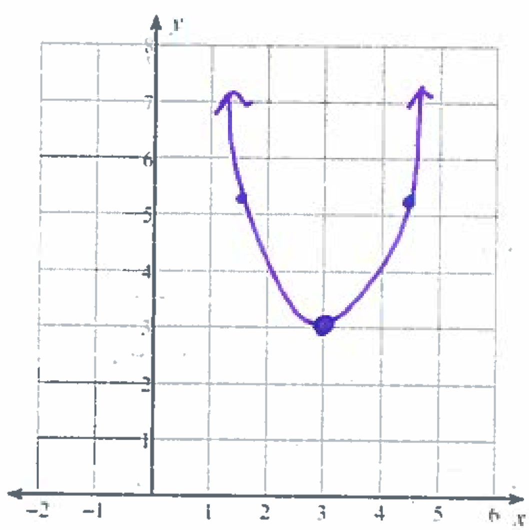


Fill in rest of parabola.
vertex: (3,-3)
axis of symmetry: $x = 3$



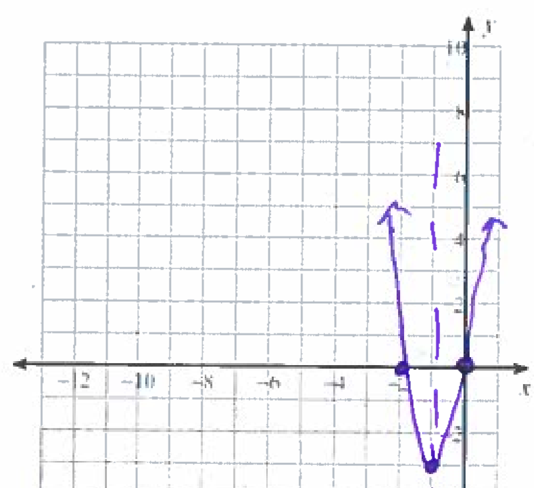
Fill in the rest of parabola.
Solutions: (-2,0) and (0,0)
axis of symmetry
$x = -1$

1) $y = x^2 - 6x + 12$



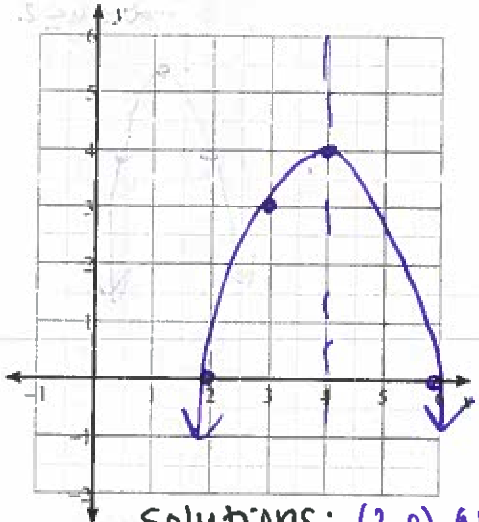
vertex: (3,3)
x-intercepts: none

2) $y = 3x^2 + 6x$



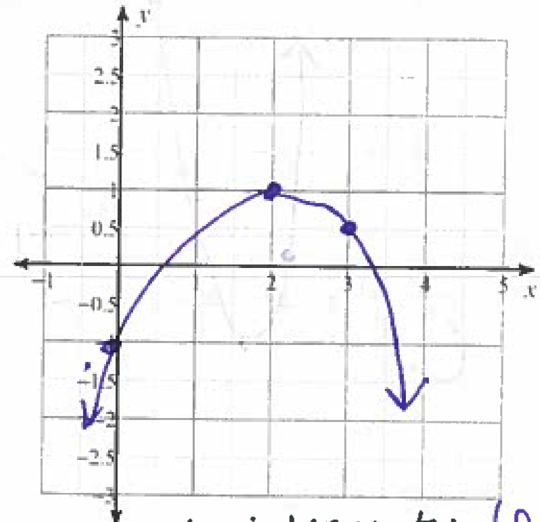
zeros: (-2,0) and (0,0)
y-intercept: (0,0)
axis of symmetry: $x = -1$

3) $y=-x^2+8x-12$



Solutions: (2,0) and (6,0)
vertex: (4,4)
axis of symmetry: $x = 4$

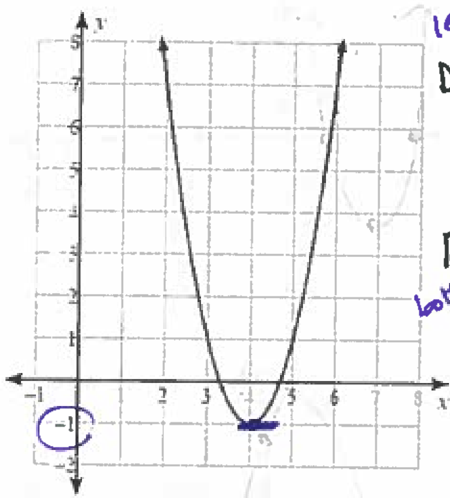
4) $y=-\frac{1}{2}x^2+2x-1$



y-intercept: (0,-1)
vertex: (2,1)

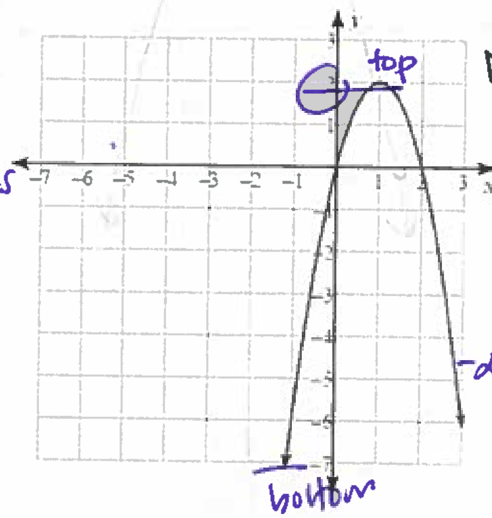
Domain and Range of Quadratic Functions

1) $y=2x^2-16x+31$



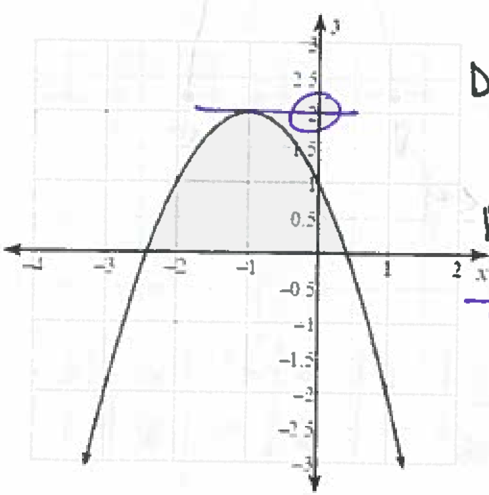
left x right
Domain:
$-\infty < x < \infty$
$\mathbb{R}$
all real numbers
Range:
bottom y top
$\boxed{-1 \le y < \infty}$

2) $y=-2x^2+4x$



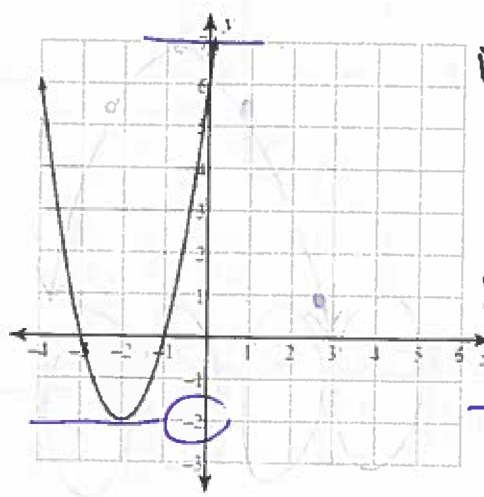
Domain:
$\mathbb{R}$
all real numbers
Range:
$-\infty < y \le 2$

3) $y=-x^2-2x+1$



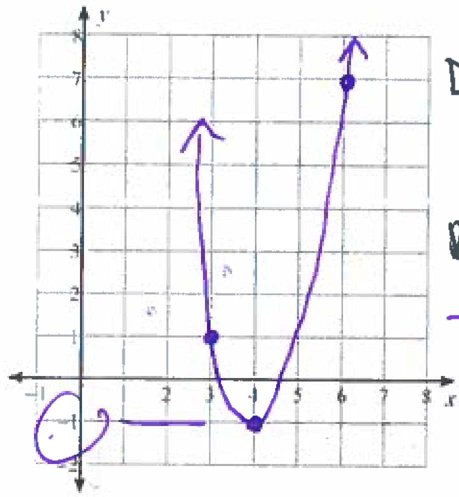
Domain:
$\mathbb{R}$
Range:
$-\infty < y \le 2$

4) $y=2x^2+8x+6$



Domain:
$\mathbb{R}$
Range:
$-2 \le y < \infty$

1) $y = 2x^2 - 16x + 31$



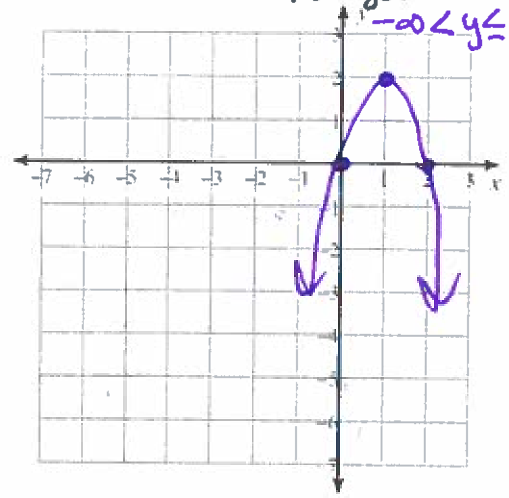
Domain: $\mathbb{R}$

Range: $-1 \le y < \infty$

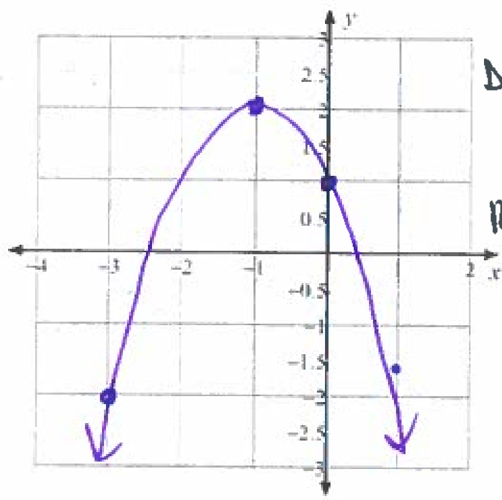
2) $y = -2x^2 + 4x$

Domain: $\mathbb{R}$

Range: $-\infty < y \le 2$



3) $y = -x^2 - 2x + 1$



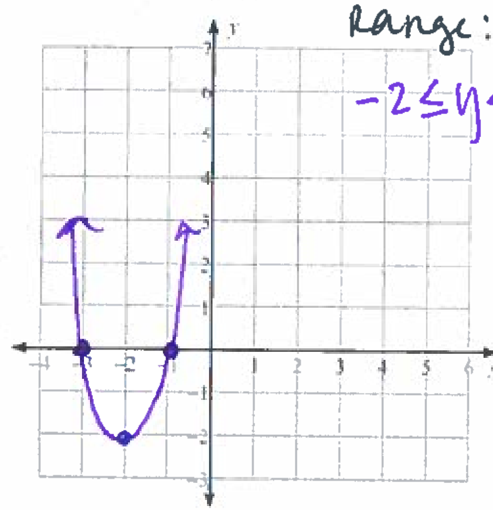
Domain: $\mathbb{R}$

Range: $-\infty < y \le 2$

4) $y = 2x^2 + 8x + 6$

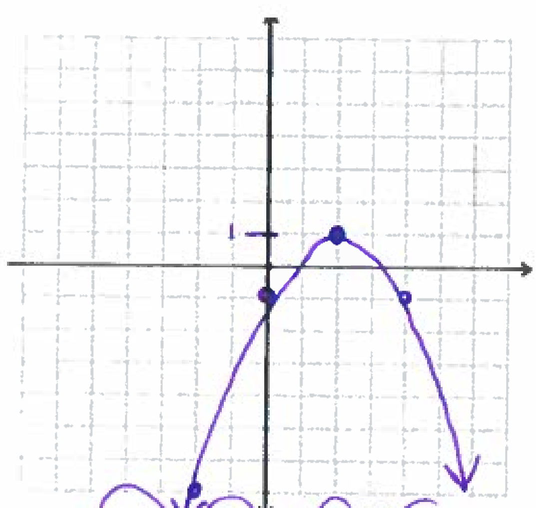
Domain: $\mathbb{R}$

Range: $-2 \le y < \infty$



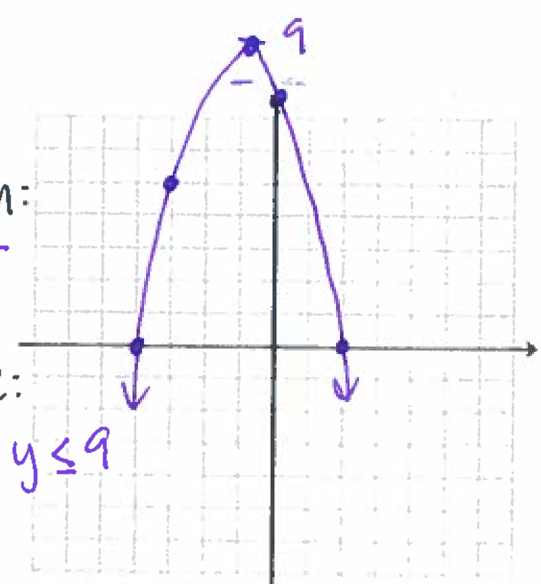
Domain: $\mathbb{R}$

Range: $-\infty < y \le 1$



D & R of →

x	-2	0	2	4
f(x)	-7	-1	1	-1



Domain: $\mathbb{R}$

Range: $-\infty < y \le 9$

D & R of →

x	-4	-3	-1	0	2
j(x)	0	5	9	8	0

Vertex Form

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

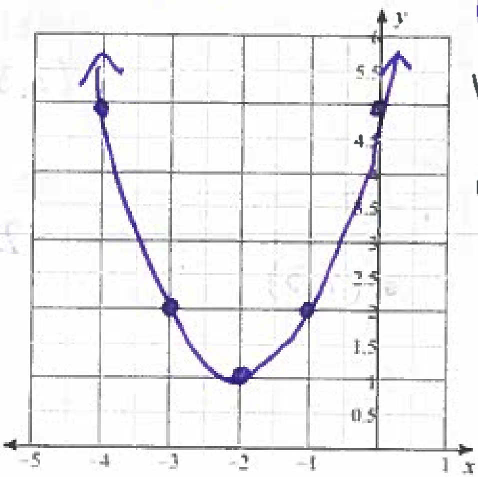
Sketch the graph of each function.

1) $f(x) = (x+2)^2 + 1$

opposite of inside

outside

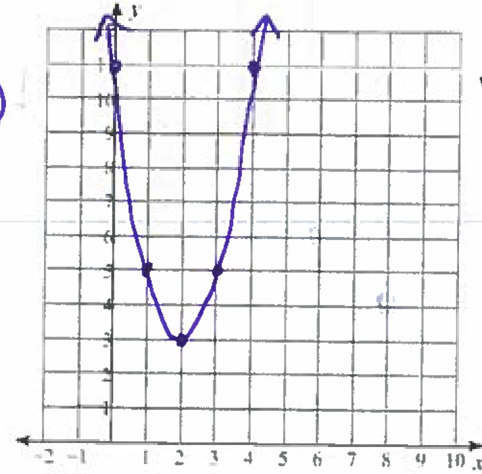
(__ , __)



vertex: $(-2, 1)$

"a": 1

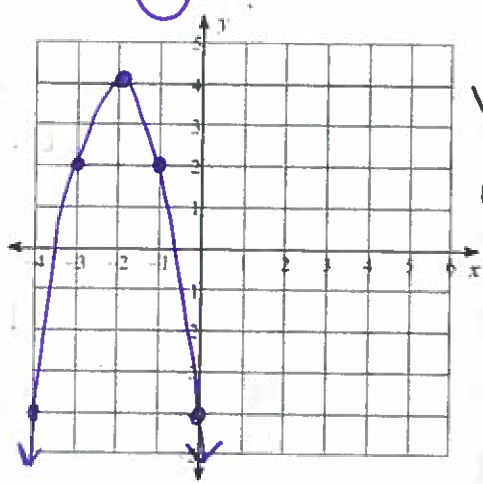
2) $f(x) = 2(x-2)^2 + 3$



vertex: $(2, 3)$

"a": 2

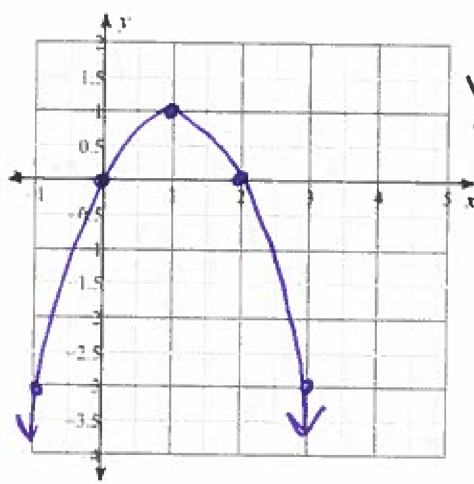
3) $f(x) = -2(x+2)^2 + 4$



vertex: $(-2, 4)$

"a": -2

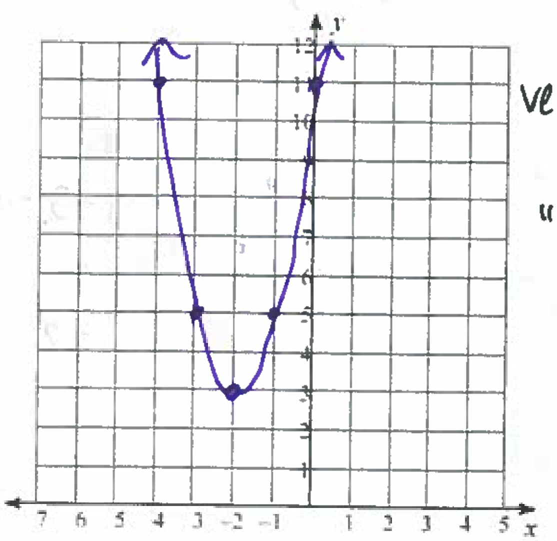
4) $f(x) = -(x-1)^2 + 1$



vertex: $(1, 1)$

"a": -1

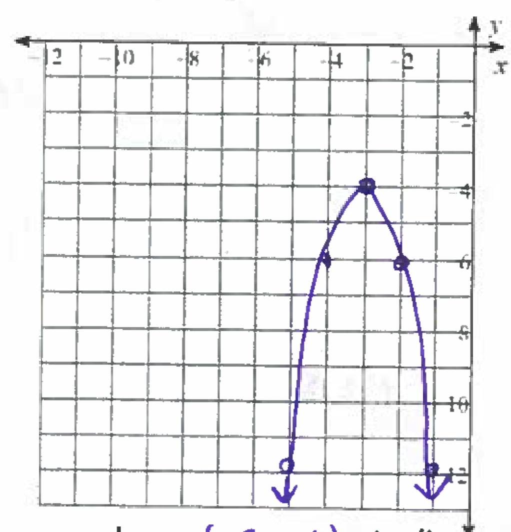
5) $f(x) = 2(x+2)^2 + 3$



vertex: $(-2, 3)$

"a": 2

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



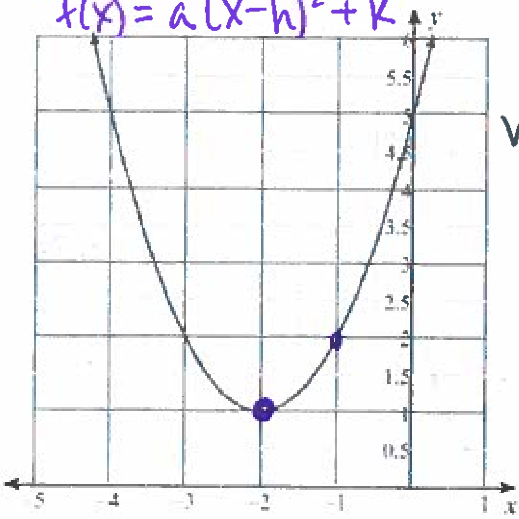
vertex: $(-3, -4)$ "a": -2

5

form

1) $\boxed{f(x) = 1(x+2)^2 + 1}$

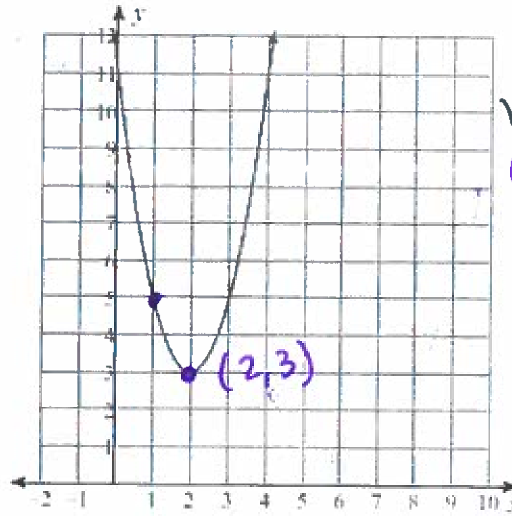
$f(x) = a(x-h)^2 + k$



vertex: $(-2,1)$

"a": 1

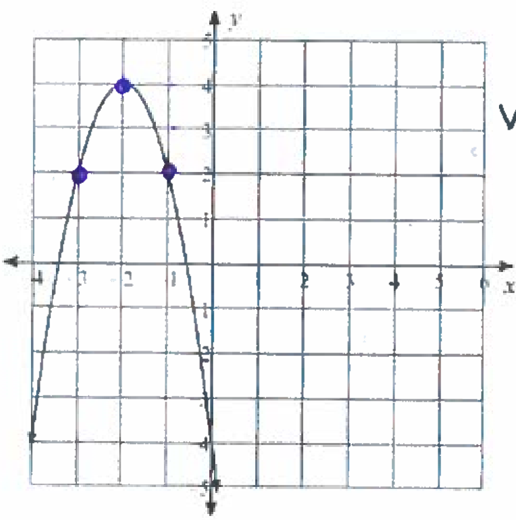
2) $f(x) = 2(x-2)^2 + 3$



vertex: $(2,3)$

"a": 2

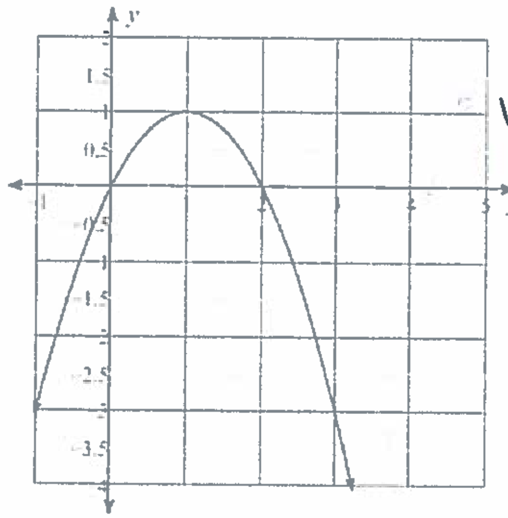
3) $f(x) = -2(x+2)^2 + 4$



vertex: $(-2,4)$

"a": -2

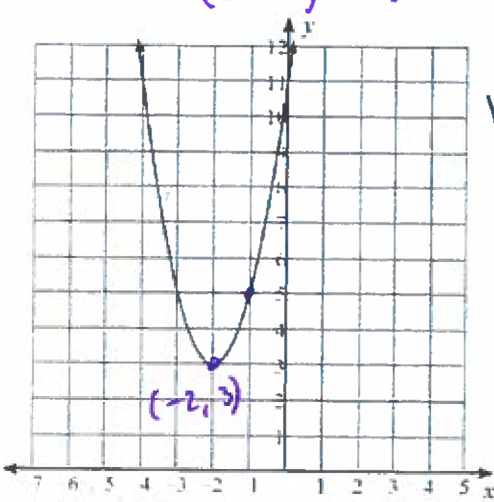
4) $f(x) = -1(x-1)^2 + 1$



vertex: $(1,1)$

"a" -1

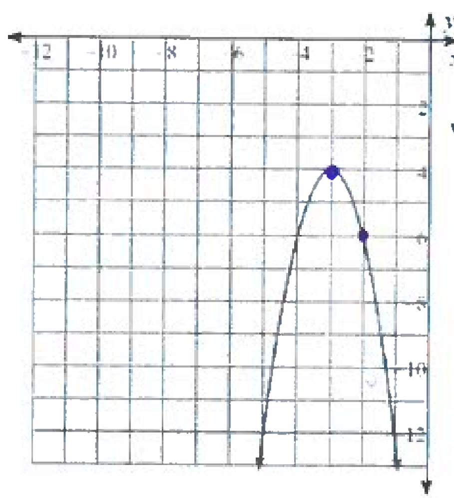
5) $f(x) = 2(x+2)^2 + 3$



vertex: $(-2,3)$

"a": 2

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



vertex: $(-3,-4)$

"a": -2

Effects of Change

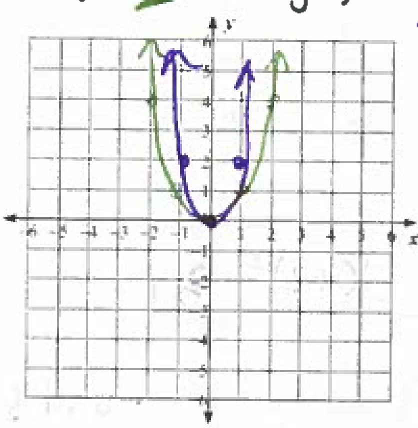
Describe in words the transformation from f(x) to g(x).

4

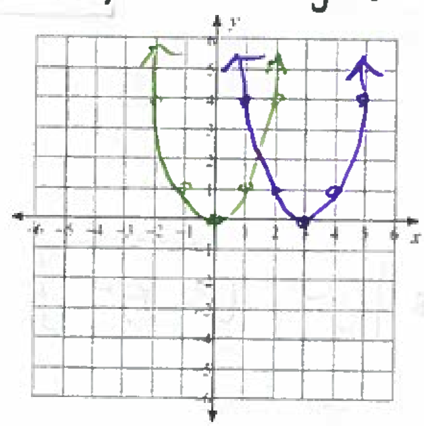
1. $f(x) = x^2$ $g(x) = (x-4)^2$ shifts right 4
2. $f(x) = x^2$ $g(x) = -x^2$ reflects over x-axis
3. $f(x) = x^2$ $g(x) = x^2 - 6$ shifts down 6
4. $f(x) = x^2$ $g(x) = -(x+1)^2$ reflects over x-axis, shifts left 1
5. $f(x) = x^2$ $g(x) = 5x^2$ narrower
6. $f(x) = x^2$ $g(x) = \frac{1}{2}x^2 - 4$ wider, shifts down 4
7. $f(x) = x^2$ $g(x) = -(x-3)^2 + 8$ reflects over x-axis, shifts right 3, shifts up 8
8. $f(x) = x^2$ $g(x) = \underset{\text{reflect}}{-}\overset{\text{narrower}}{2}(x - \underset{\text{right}}{3})^2 + 2$ reflect over x-axis, narrower
shifts right 3
shifts up 2

Graph the equations and state the change.

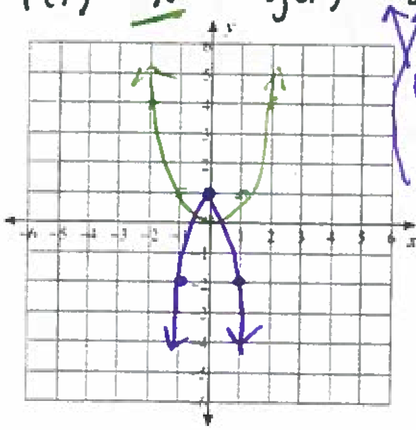
9. $f(x) = x^2$ $g(x) = 2x^2$ narrower



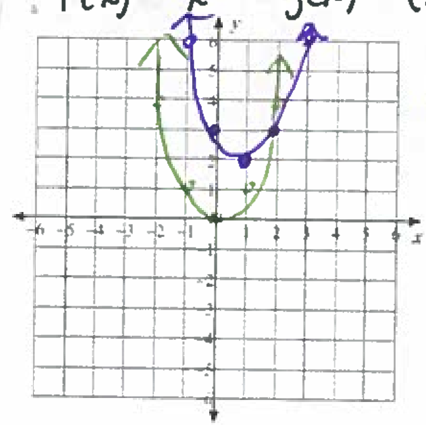
10. $f(x) = x^2$ $g(x) = (x-3)^2$ Right 3



11. $f(x) = x^2$ $g(x) = -3x^2 + 1$ up 1
reflects over x-axis
narrower



12. $f(x) = x^2$ $g(x) = (x-1)^2 + 2$ Right 1 up 2

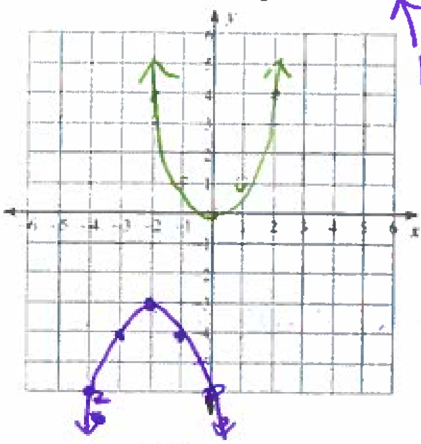


13. $f(x) = x^2$ $g(x) = -(x+2)^2 - 3$

left 2

down 3

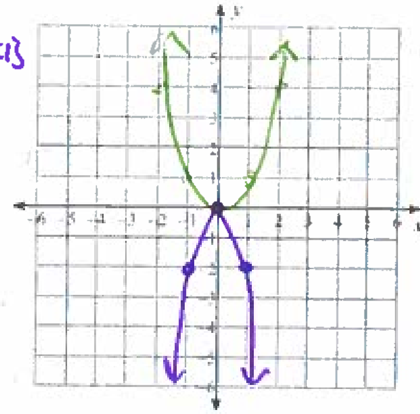
reflects over x-axis



14. $f(x) = x^2$ $g(x) = -2x^2$

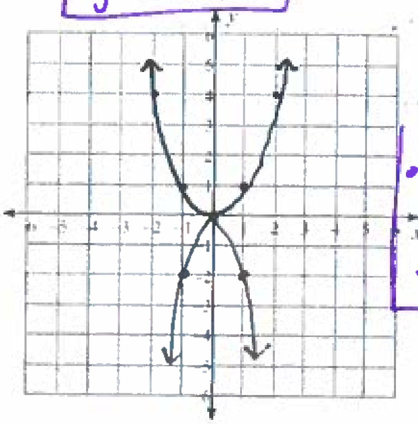
narrower

reflects over x-axis



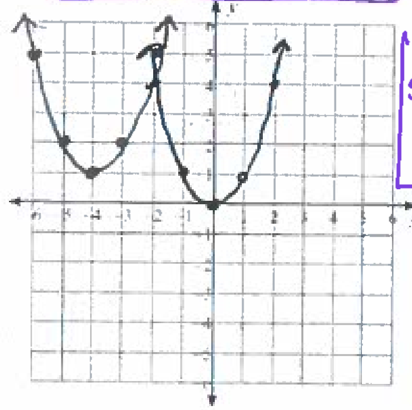
Explain the change/transformation. What is the equation of the changed quadratic?

15. $\boxed{y = -2x^2}$



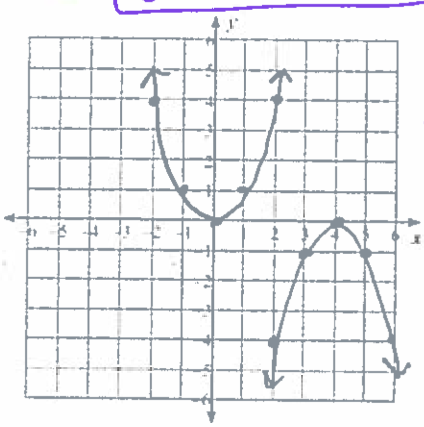
- reflects over x-axis
- narrower

16. $\boxed{y = (x+4)^2 + 1}$



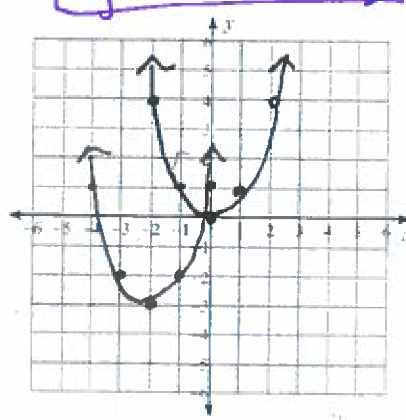
Shifts left 4
Shifts up 1

17. $\boxed{y = -(x-4)^2}$



- reflects over x-axis
- right 4

18 $\boxed{y = (x+2)^2 - 3}$



- shifts left 2
- shifts down 3