

Name: Answers

Date: _____ Per: _____

WS – Graphing and Solving Quadratic Equations

Formulas Review:

- 1) What's the general form of a quadratic equation? $f(x) = ax^2 + bx + c$
- 2) What coefficient variable helps determine how a parabola opens? a
- 3) If given only the quadratic equation, what's the formula to figure out the axis of symmetry? $x = \frac{-b}{2a}$
- 4) What is the vertex of a parabola? The minimum or maximum point of a parabola
- 5) Given the coordinate (ordered pair) of the vertex:

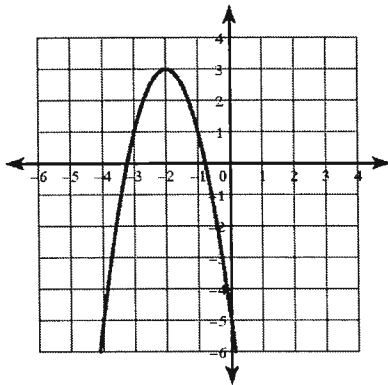
Which coordinate helps indicate the axis of symmetry? x -coordinate

Which coordinate helps indicate the greatest or least value? y -coordinate

Practice:

From the drawn parabolas, find the indicated information. Check using the axis of symmetry formula and plugging it back into the equation to find the least or greatest value.

6) $y = -2x^2 - 8x - 5$



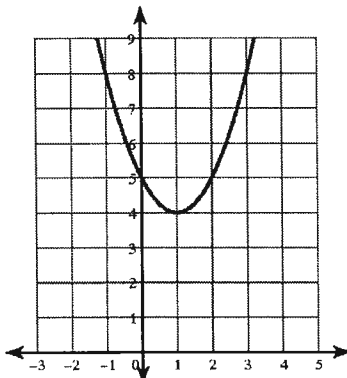
a) Vertex: $(-2, 3)$

b) Axis of Symmetry: $x = -2$

c) Greatest/least value: 3

d) Check: $x = \frac{-b}{2a}$
 $x = \frac{8}{2(-2)}$
 $x = -2$
 $y = -2(-2)^2 - 8(-2) - 5$
 $y = -8 + 16 - 5$
 $y = 3$ ✓

7) $y = x^2 - 2x + 5$



a) Vertex: $(1, 4)$

b) Axis of Symmetry: $x = 1$

c) Greatest/least value: 4

d) Check: $x = \frac{-b}{2a}$
 $x = \frac{2}{2(1)}$
 $x = 1$
 $y = 1^2 - 2(1) + 5$
 $y = 1 - 2 + 5$
 $y = 4$ ✓

Fill out the indicated information. (Clue: you may have to adjust the scales on the coordinate planes)

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

a) Open up or down? Down

b) Vertex: $(-1, 4)$

$$x = \frac{-b}{2a} \quad y = (-1)^2 - 2(-1) + 3$$

$$x = \frac{+2}{2(-1)} = -1 \quad y = -1 + 2 + 3$$

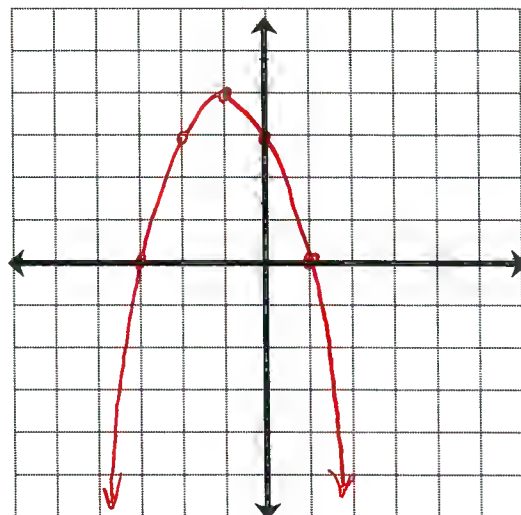
$$y = 4$$

c) Axis of Symmetry: $x = -1$

d) Greatest/least value: 4

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

e)



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

a) Open up or down? Up

b) Vertex: $(1, -4)$

$$x = \frac{-b}{2a} \quad y = 2(1)^2 - 4(1) - 2$$

$$x = \frac{-(-4)}{2(2)} = 1 \quad y = 2 - 4 - 2$$

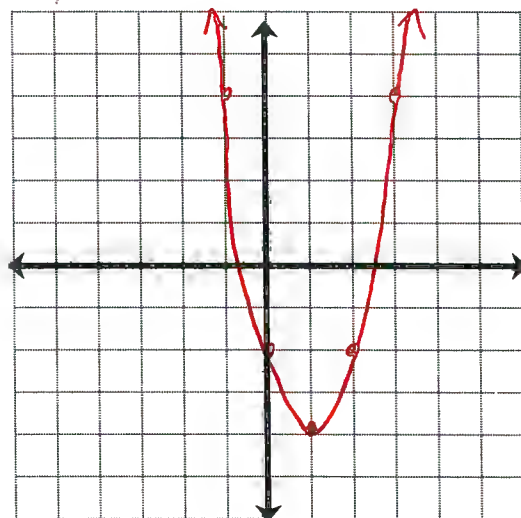
$$y = -4$$

c) Axis of Symmetry: $x = 1$

d) Greatest/least value: -4

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

e)



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

a) Open up or down? Down

b) Vertex: $(1, 2)$

$$x = \frac{-b}{2a} \quad y = -2(1)^2 + 4(1)$$

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

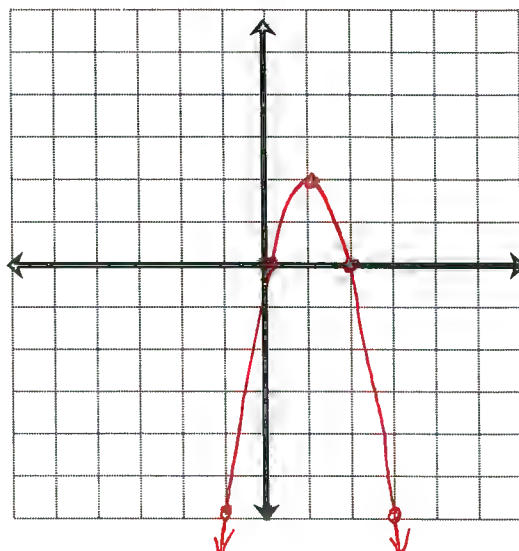
$$y = 2$$

c) Axis of Symmetry: $x = 1$

d) Greatest/least value: 2

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

e)



Helpful Reminders:

- The x-coordinate of the vertex is $\frac{-b}{2a}$ and then you need to plug that number in to find the y-coordinate.
- The axis of symmetry is the vertical line through the vertex.

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

$1 - 4 + 4$

a) Open up or down? Up

b) Vertex: ~~(-2, 0)~~

$x = \frac{-b}{2a}$

$x = \frac{-4}{2(1)} = -2$

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

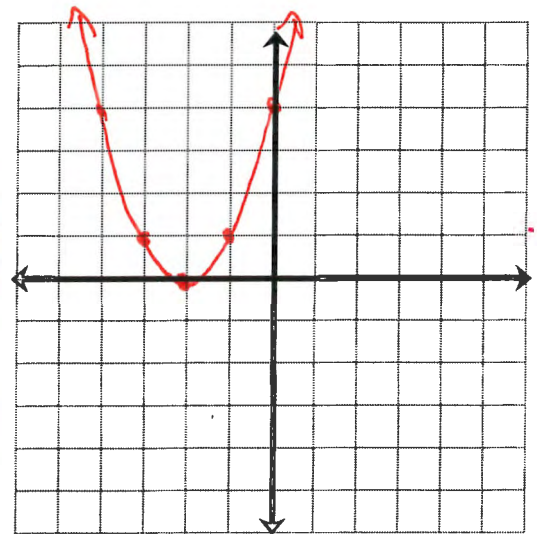
$y = 4 - 8 + 4$

$y = 0$

c) Axis of Symmetry: $x = -2$

d) Greatest/least value: 0

e)



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

12) $y = -3x^2 - 6x$

a) Open up or down? Down

b) Vertex: $(-1, 3)$

$x = \frac{-b}{2a}$

$x = \frac{6}{2(-3)} = -1$

$y = -3(-1)^2 - 6(-1)$

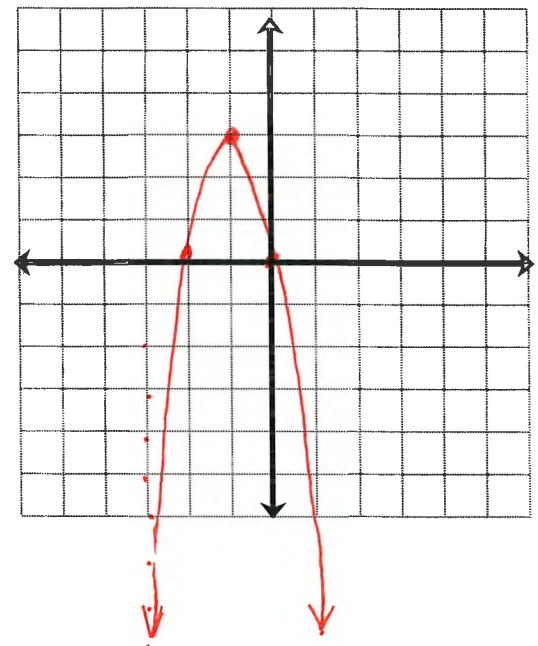
$= -3 + 6$

$= 3$

c) Axis of Symmetry: $x = -1$

d) Greatest/least value: 3

e)



x	y
-3	-9
-2	0
-1	3
0	0
1	-9