Graphing Quadratics 3D

Packet 1

Name: _____

Section 9.1A: Graphing Quadratic Functions Using Tables
Guided Notes
Honors Algebra I

Name: _____

Date: _____

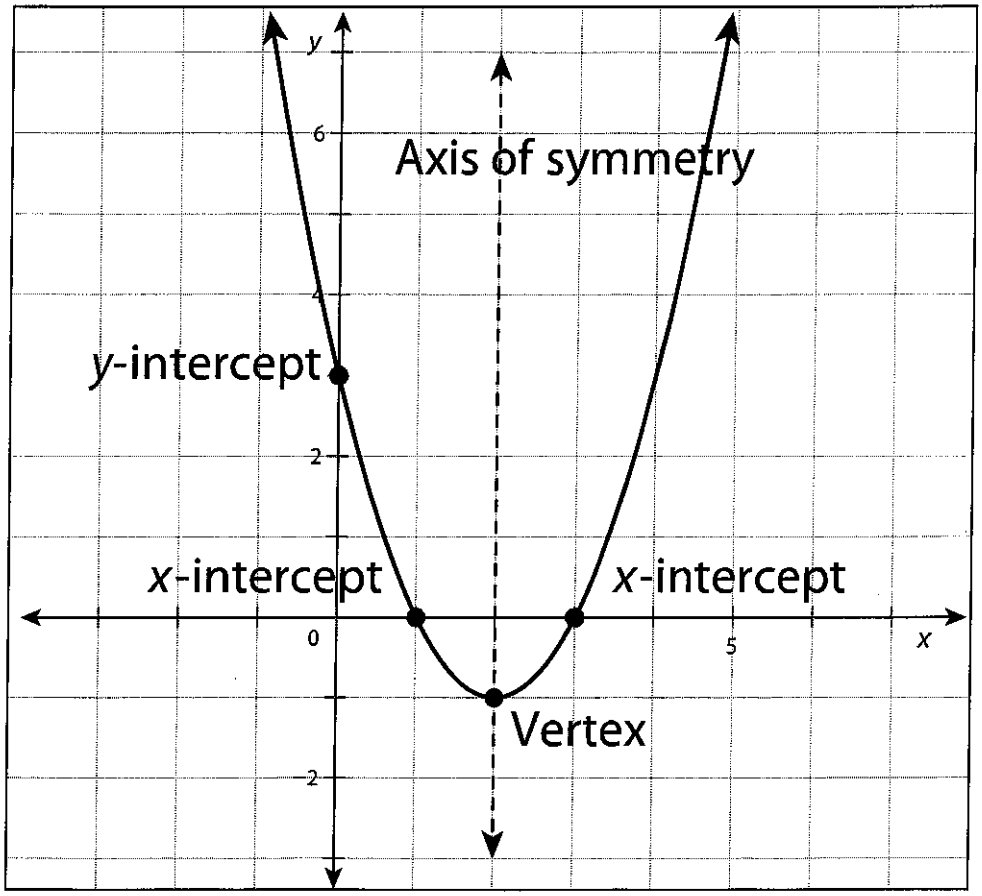
Quadratic Functions

Standard Form: $f(x) = ax^2 + bx + c$

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

Intercept Form: $f(x) = a(x - p)(x - q)$

Key Components of a Quadratic Function



6.4 Guided Notes – Graphing Quadratic Functions

Name: _____

Date: _____ Period: ___

Objective: I can graph quadratic functions in standard form, vertex form, and factored form.

The graph of a quadratic function is called a _____. There are _____ forms of quadratic equations:

$f(x) = ax^2 + bx + c$	$f(x) = a(x - h)^2 + k$	$f(x) = a(x - p)(x - q)$
_____	_____	_____

- If _____ is _____, the graph opens _____.

  If _____ is _____, the graph opens _____.

- All quadratic equations have a _____ which is the turning point of the graph.

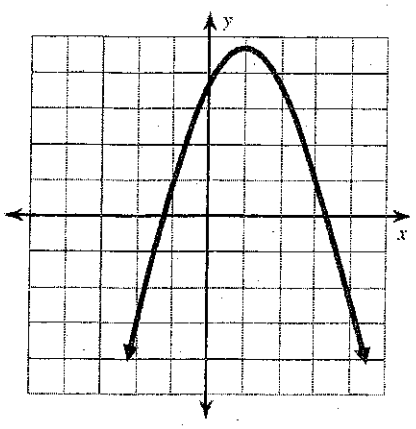
  Quadratic graphs are symmetrical across the _____, which runs through the

  _____. **Formula:**

- A quadratic function crosses the y-axis _____.

  The y-intercept always has an x-value of ____. For a parabola, the y-intercept will be the point (,)

- A quadratic function crosses or touches the x-axis _____, _____, or _____ times.



In this graph:

Vertex: _____

Axis of symmetry: _____

Y-intercept is: _____

X-intercepts are: _____

Graphing in STANDARD FORM – $f(x) = ax^2 + bx + c$

EXAMPLE - Graph the function: $f(x) = 4x^2 - 8x + 1$

To find the axis of symmetry:

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

To find the vertex, plug _____ back into the equation.

$f(\_\_\_) = 4(\quad)^2 - 8(\quad) + 1 =$

Key Features:

a = _____ b = _____ c = _____

The parabola will open UP or DOWN

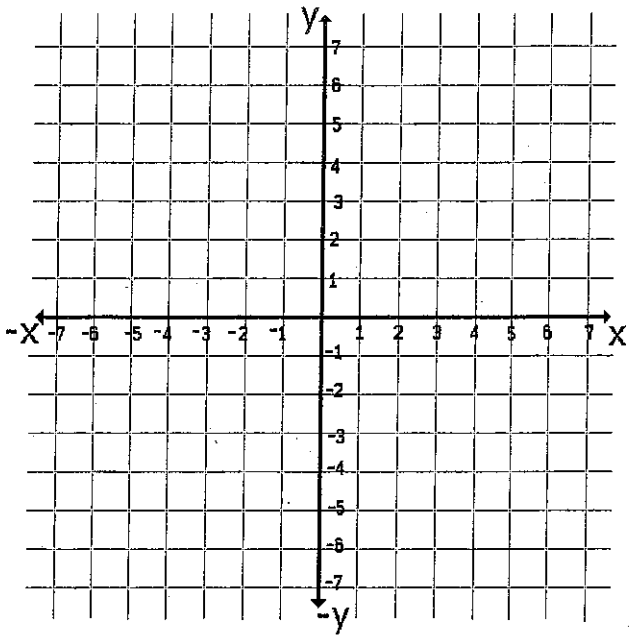
The parabola has a MAX or MIN

The axis of symmetry at $x =$ _____

Vertex at (,)

y-intercept = (,)

point = (,)



YOU TRY - Graph the function: $f(x) = -\frac{1}{2}x^2 + 2x - 1$

Key Features:

a = _____ b = _____ c = _____

The parabola will open UP or DOWN

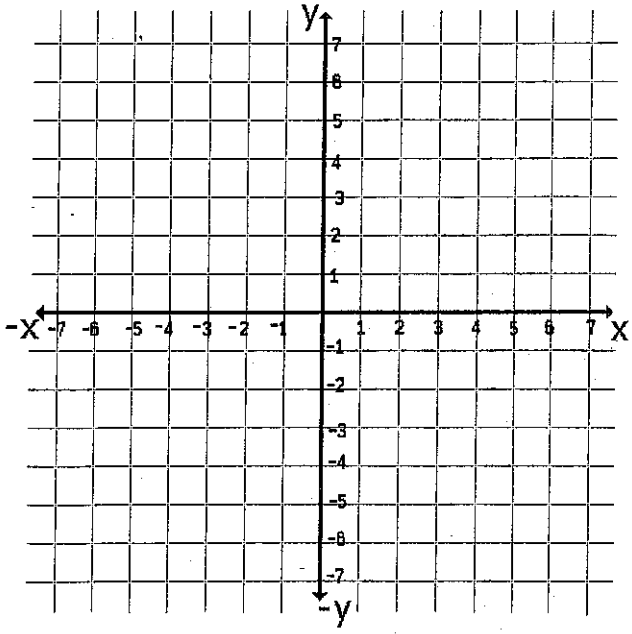
The parabola has a MAX or MIN

The axis of symmetry at $x =$ _____

Vertex at (,)

y-intercept = (,)

point = (,)

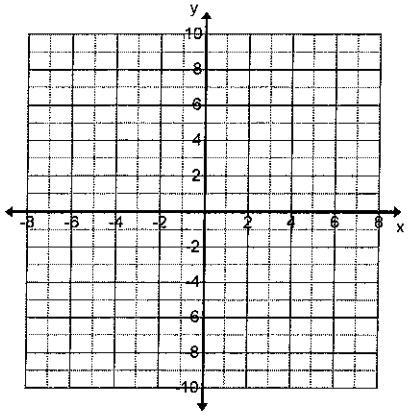


Graphing Quadratic Functions in Standard Form Worksheet #1

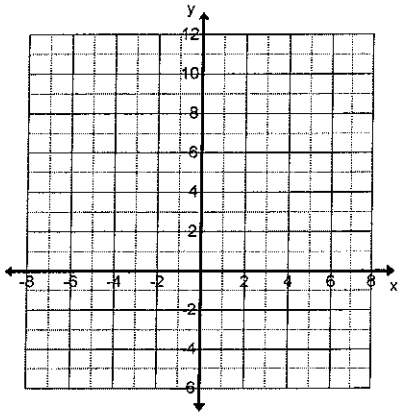
Name:_____ Period_____ Date _____

Directions: Graph these equations. Identify the axis of symmetry, vertex, and y-intercept.

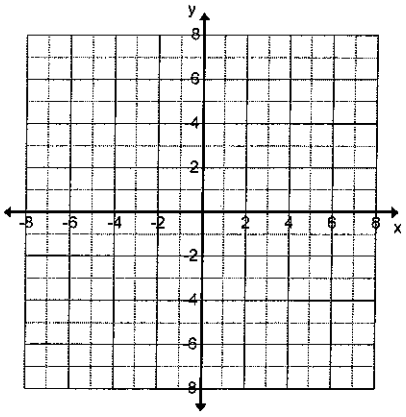
1.) $y = x^2 - 2x - 3$



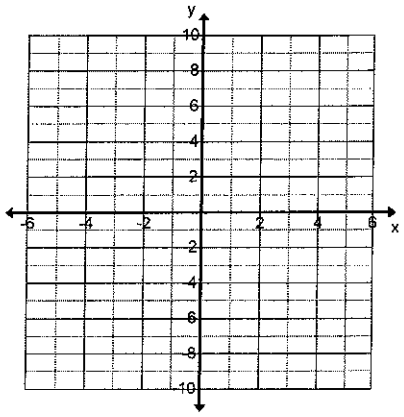
2.) $y = 3x^2 + 12x + 9$



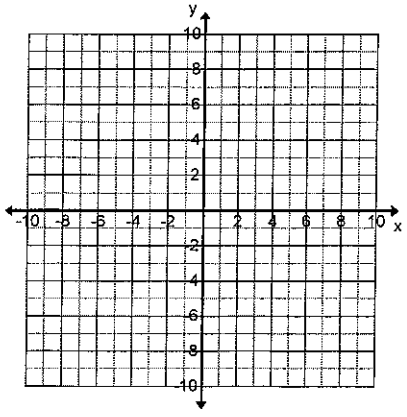
3.) $y = -x^2 + 6x - 4$



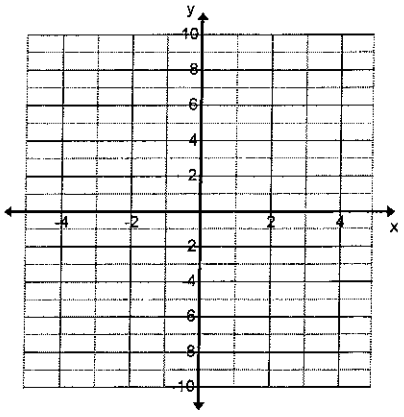
4.) $y = -4x^2 + 8$



* 5.) $y = \frac{1}{4}x^2 + x - 6$



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



(Intercept)

Graphing in FACTORED FORM – $f(x) = a(x-p)(x-q)$

p, q are the _____ also called the _____ and the axis of symmetry can be found using $\frac{p+q}{2}$

Find the x-intercepts and the axis of symmetry:

1. $f(x) = -3(x-1)(x+2)$
   x-ints: (,) a.o.s: (,)

2. $f(x) = (x+3)(x+3)$
   x-ints: (,) a.o.s: (,)

3. $f(x) = -0.5(x-7)(x+1)$
   x-ints: (,) a.o.s: (,)

EXAMPLE - Graph the function: $f(x) = -2(x-3)(x-2)$

Key Features:

a = _____

The parabola will open UP or DOWN

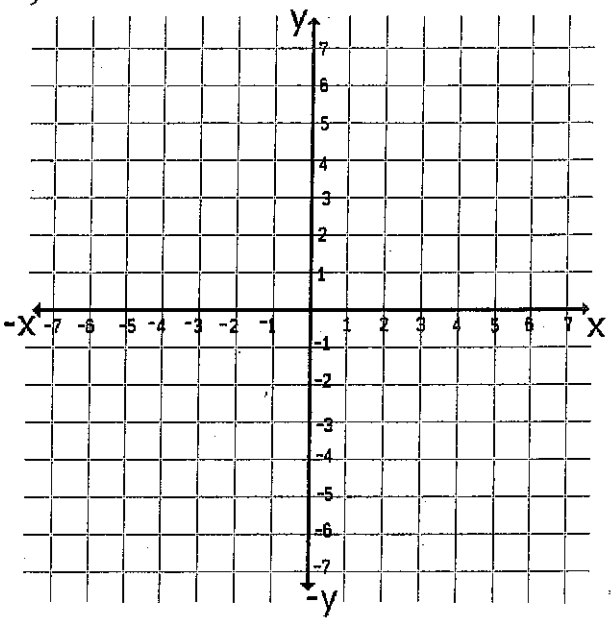
The axis of symmetry at x = _____

Vertex at (,)

x-intercepts = (,) (,)

y-intercept = (,)

point = (,)



YOU TRY - Graph the function: $f(x) = (x+1)(x-4)$

Key Features:

a = _____

The parabola will open UP or DOWN

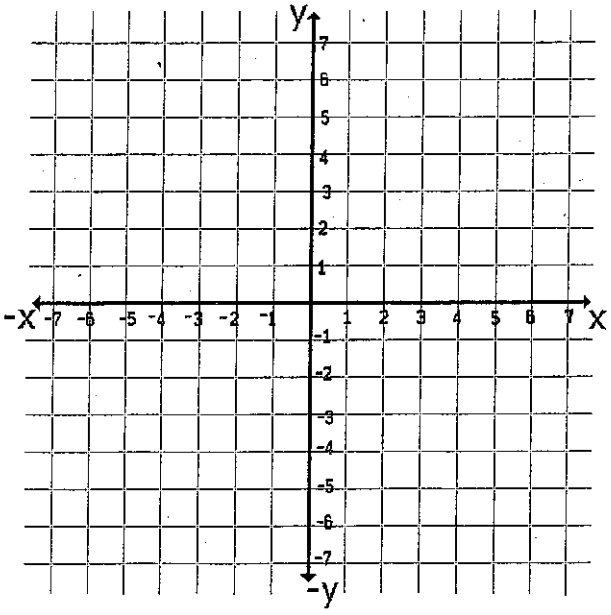
The axis of symmetry at x = _____

Vertex at (,)

x-intercepts = (,) (,)

y-intercept = (,)

point = (,)



NOTE: For all quadratics, if you can find the vertex and *one* point, you can sketch the graph.

Name: Date: Period:

Practice Worksheet: Graphing Quadratic Functions in Intercept Form

For #1-6, label the x-intercepts, axis of symmetry, vertex, y-int., and at least one more point on the graph.

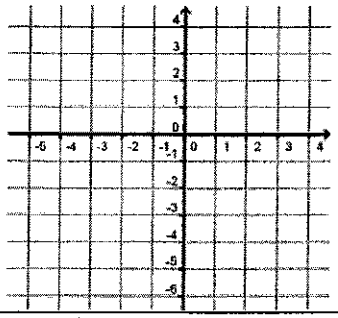
1] $y = \frac{1}{2}(x+4)(x-2)$

x-intercepts: (_____, 0) (_____, 0)

Axis of Symmetry is x=_____

Vertex: (____, ____)

y-intercept: (0,_____)



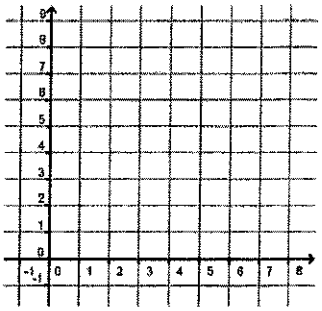
2] $y = -\frac{1}{2}x(x-8)$

x-intercepts: (_____, 0) (_____, 0)

Axis of Symmetry is x=_____

Vertex: (____, ____)

y-intercept: (0,_____)



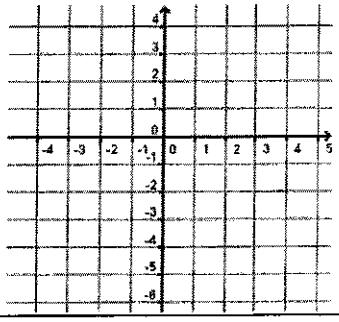
3] $y = (x+2)(x-2)$

x-intercepts: (_____, 0) (_____, 0)

Axis of Symmetry is x=_____

Vertex: (____, ____)

y-intercept: (0,_____)



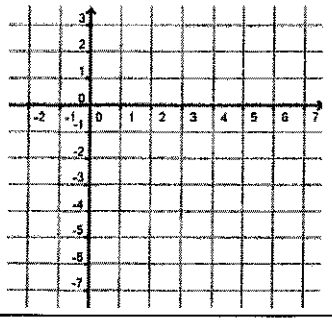
4] $y = -\frac{1}{3}(x+1)(x-5)$

x-intercepts: (_____, 0) (_____, 0)

Axis of Symmetry is x=_____

Vertex: (____, ____)

y-intercept: (0,_____)



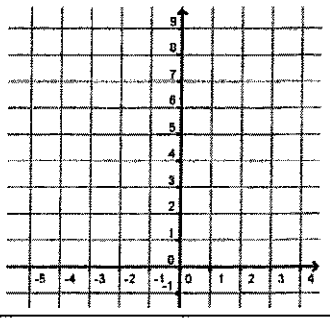
5] $y = 4(x+2)(x+1)$

x-intercepts: (_____, 0) (_____, 0)

Axis of Symmetry is x=_____

Vertex: (____, ____)

y-intercept: (0,_____)



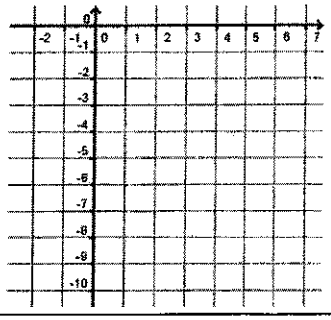
6] $y = -(x-3)(x-3)$

x-intercepts: (_____, 0) (_____, 0)

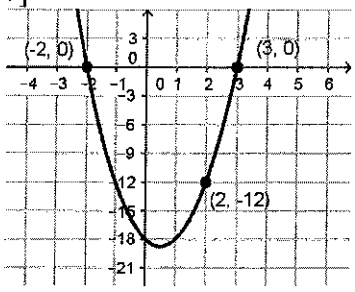
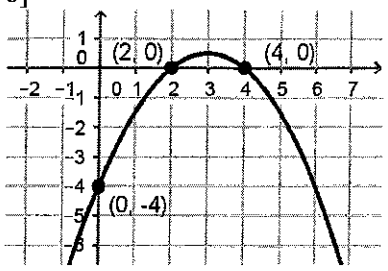
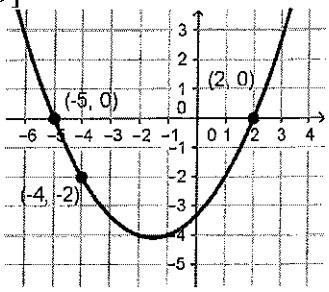
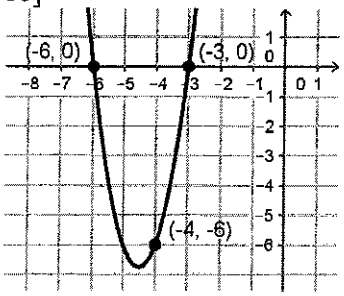
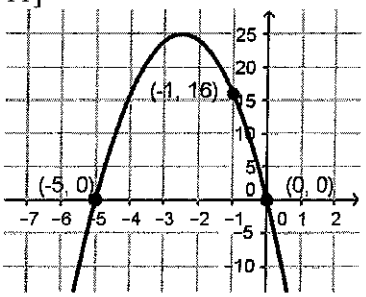
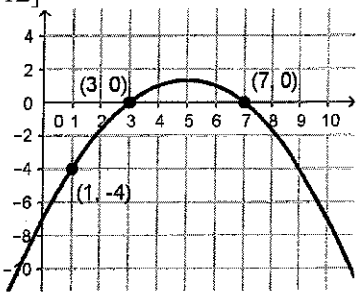
Axis of Symmetry is x=_____

Vertex: (____, ____)

y-intercept: (0,_____)



Write the equation of the parabola in intercept form.

7]  p = q = x = y = Find a. Write the equation.	8]  p = q = x = y = Find a. Write the equation.	9]  p = q = x = y = Find a. Write the equation.
10]  p = q = x = y = Find a. Write the equation.	11]  p = q = x = y = Find a. Write the equation.	12]  p = q = x = y = Find a. Write the equation.

Write the quadratic function in standard form.

13] $y = \frac{1}{2}(x+4)(x-2)$	14] $y = -(x-1)(x-1)$	15] $y = 3(x+3)(x+1)$

Graphing VERTEX FORM – $f(x) = a(x - h)^2 + k$ The vertex is always the values of (h, k)

Find the vertex and "a":

1. $f(x) = 2(x - 2)^2 + 4$
vertex: a:

2. $f(x) = -4(x + 3)^2 - 5$
vertex: a:

3. $f(x) = -(x - 1)^2 - 2$
vertex: a:

EXAMPLE - Graph the function: $f(x) = 2(x - 3)^2 - 4$

Key Features:

a = _____

The parabola will open UP or DOWN

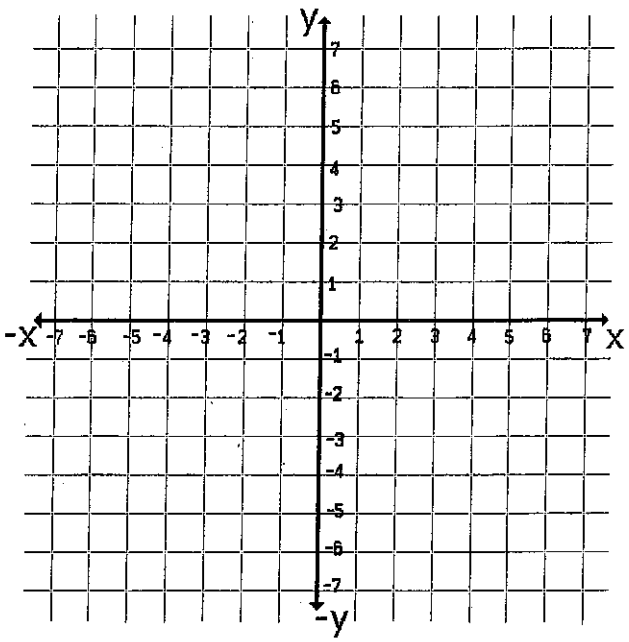
The parabola has a MAX or MIN

The axis of symmetry at $x =$ _____

Vertex at (,)

y-intercept = (,)

point = (,)



YOU TRY - Graph the function: $f(x) = -(x + 5)^2 + 2$

Key Features:

a = _____

The parabola will open UP or DOWN

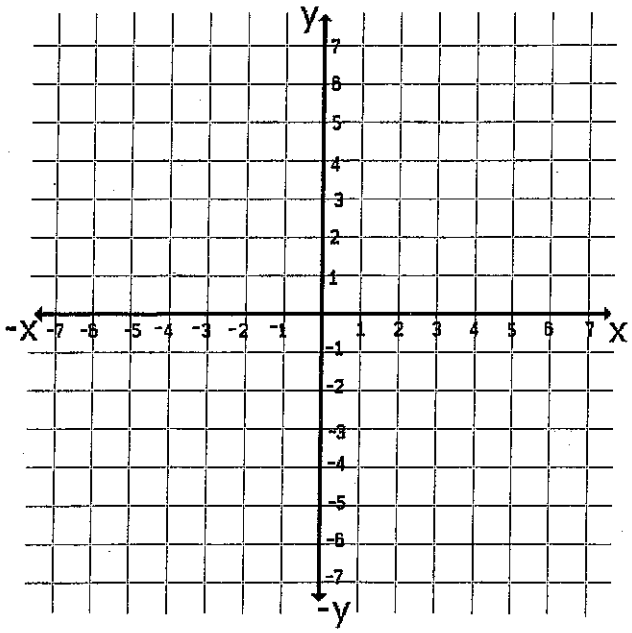
The parabola has a MAX or MIN

The axis of symmetry at $x =$ _____

Vertex at (,)

y-intercept = (,)

point = (,)



Name: _____ Date: _____

Graphing a Parabola from Vertex Form Worksheet

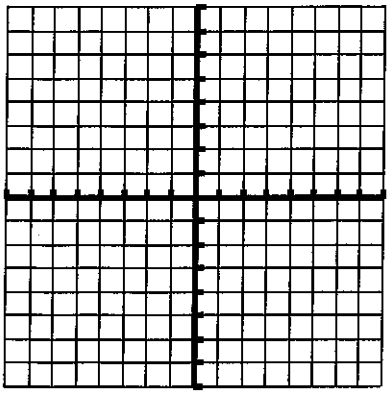
Graph each function.

1. $y = (x-1)^2 + 2$

Vertex = _____

A.O.S. = _____

Is the vertex a max or min?

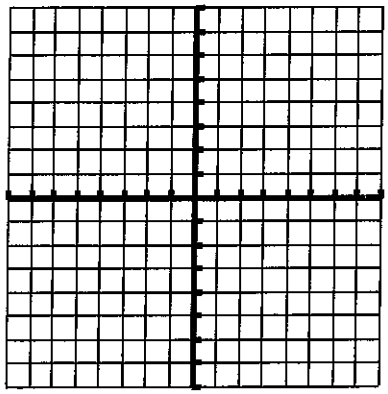


2. $y = 2(x-2)^2 + 5$

Vertex = _____

A.O.S. = _____

Is the vertex a max or min?

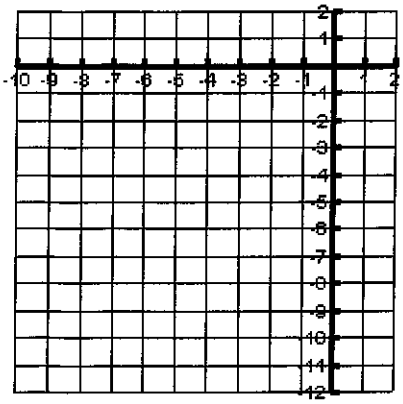


3. $y = -3(x+7)^2 - 8$

Vertex = _____

A.O.S. = _____

Is the vertex a max or min?

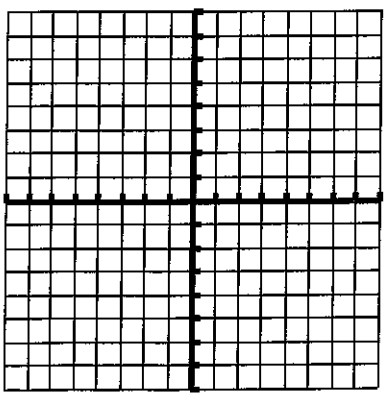


4. $y = (x-5)^2 - 3$

Vertex = _____

A.O.S. = _____

Is the vertex a max or min?

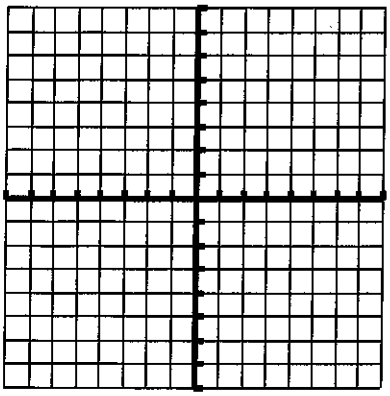


5. $y = -(x-1)^2 + 4$

Vertex = _____

A.O.S. = _____

Is the vertex a max or min?

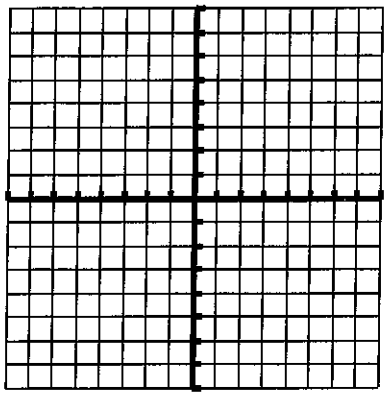


6. $y = 2(x+1)^2$

Vertex = _____

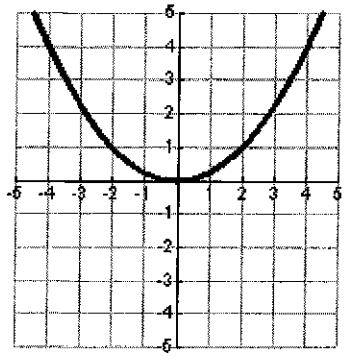
A.O.S. = _____

Is the vertex a max or min?

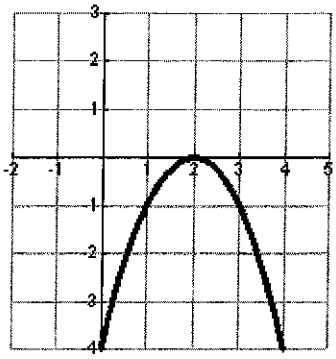


Write the equation of each parabola in vertex form.

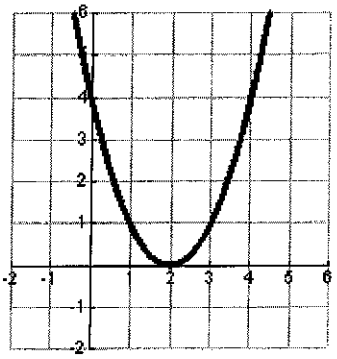
7. _____



8. _____



9. _____



10.) Write the vertex form of a quadratic equation.

11.) What does changing the "a" variable do to the graph of a quadratic?

12.) If "h" is positive how does the parabola move? Negative?

13.) What does changing the "k" variable do to the graph of a quadratic?

14.) What conclusion can you make about the variables h and k together?

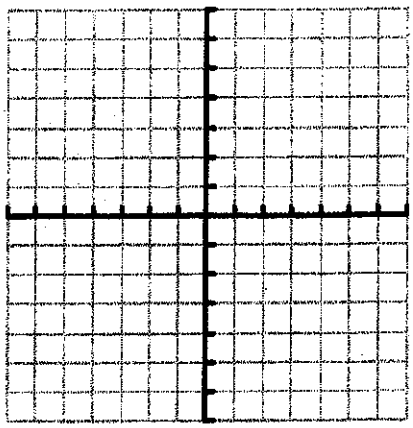
AC Math 1 Name _____

Graphing Quadratic Equations WS 1

Graph each of the following quadratic functions. Identify the appropriate characteristics.

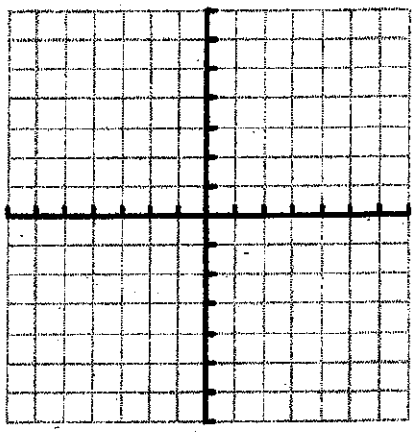
1. $f(x) = 2(x+2)(x+4)$

x-Intercept(s): _____ _____
Vertex: _____
Axis of Symmetry: _____
y-intercept: _____



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

x-Intercept(s): _____ _____
Vertex: _____
Axis of Symmetry: _____
y-intercept: _____



3. $f(x) = 2x^2 - 12x + 18$

x-Intercept(s): _____ _____
Vertex: _____
Axis of Symmetry: _____
y-intercept: _____