Algebra 1   Unit 8: Quadratic Functions   Practice
Day 7 – Graphing in Intercept Form   **Name:** _____

Practice Assignment   **Date:** _____ **Block:** _____

Review - Factor the following quadratic equations:

a. $y = x^2 + x - 30$ b. $y = x^2 - 100$

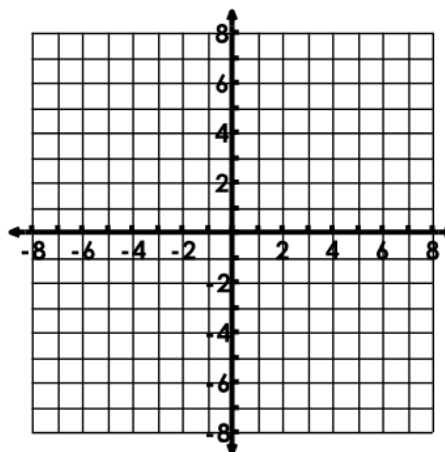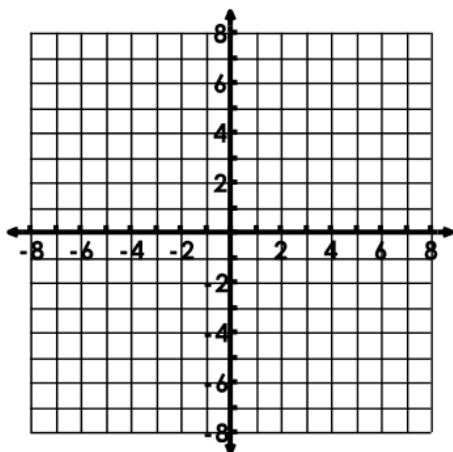**Find the x-intercepts and vertex of the following:**

c. $y = (x + 7)(x - 3)$ d. $y = -(x + 12)(x + 2)$

Graph the following quadratic functions. Show how you calculated the vertex.

     1. $y = (x + 1)(x - 3)$ 2. $y = -2(x + 2)(x + 4)$

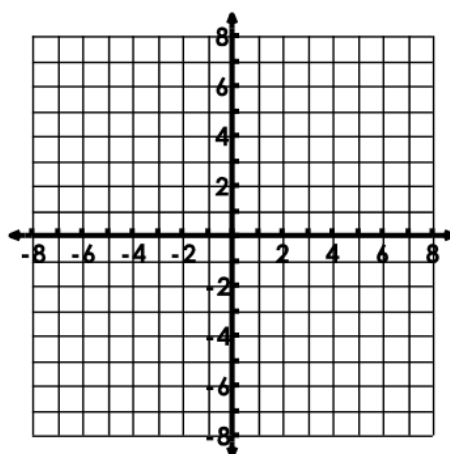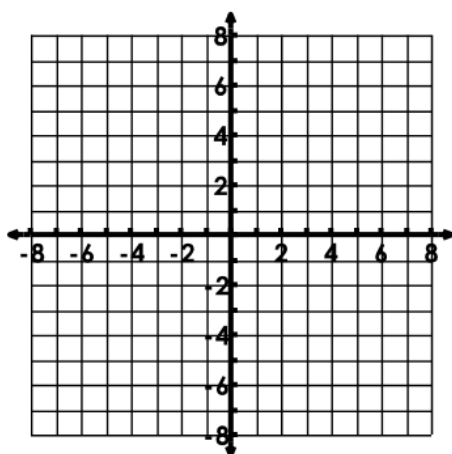Algebra 1   Unit 8: Quadratic Functions   Practice

3. $y = (x - 5)(x + 3)$ 4. $y = \frac{1}{2}(x + 2)(x - 6)$

Write an equation for the following descriptions or graphs in intercept (factored) form. Assume there are no stretches or shrinks with each graph.
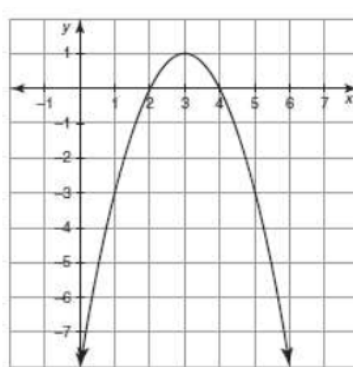
5. Write a quadratic function that represents a parabola that opens down and has x-intercepts of (-2, 0) & (5,0).

6. Write a quadratic function that represents a parabola that opens up and has x-intercepts of (3, 0) and (7, 0).

7.

8.
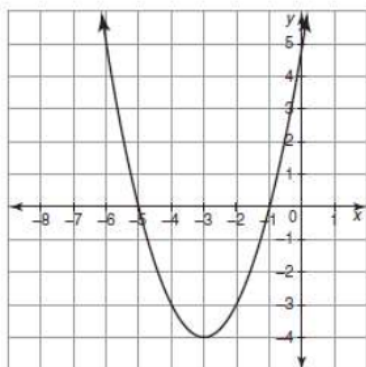
Algebra 1   Unit 8: Quadratic Functions   Notes

Day 7 – Writing Equations of Parabolas from a Graph

From days 5 – 8, you learned about three different forms of quadratic functions – vertex, standard, and factored form. Each form tells you something different about the graph.
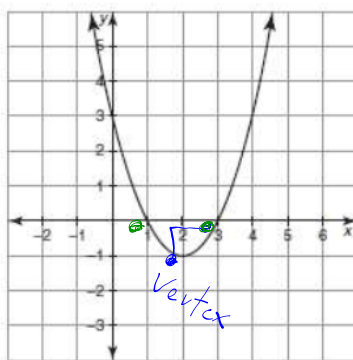
Vertex Form	Standard Form	Intercept Form (Factored Form)
$y = a(x - h)^2 + k$	$y = ax^2 + bx + c$	$y = a(x - p)(x - q)$
(h, k) is the vertex	c is the y-intercept	p and q are x-intercepts
a always determines the way the graph opens		

Writing Equations of Parabolas Given a Graph

For the following graphs:

     A. Create an equation in both intercept and vertex form to describe the parabola. Assume there are no stretches or shrinks with each graph.

     B. Once you created both equations, convert both to standard form. Check to make sure the y-intercepts match both the graph and the equations in standard form.

     C. Put all three equations into your graphing calculator. Do you get the same graph for all three equations?
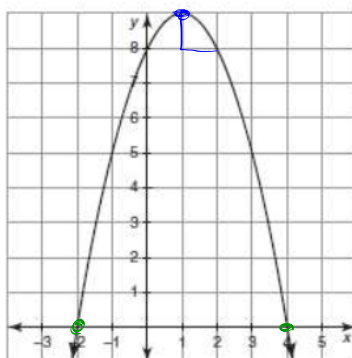
a.

Intercept Form   ($x$int)

$x = 1$ $x = 3$

$y = a(x - \#)(x - \#)$

$y = 1(x - 1)(x - 3)$

Standard Form

$y = (x - 1)(x - 3)$

$y = x^2 - 4x + 3$

Vertex Form $(2, -1)$ (h, k)

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

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

Standard Form

b.

Intercept Form   ($x$int)

$x = -2$ $x = 4$

$y = a(x - \#)(x - \#)$

$y = -1(x + 2)(x - 4)$

Standard Form

$y = -1(x + 2)(x - 4)$

Vertex Form $(1, 9)$ (h, k)

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

$y = -1(x - 1)^2 + 9$

Standard Form

$y = -(x^2 - 2x - 8)$

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

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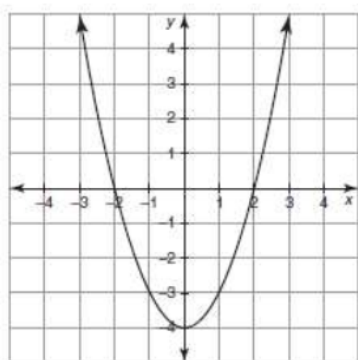$$y = x^2 - 4x + 3$$

Convert to Intercept
(Factor)

$$(x - 1)(x - 3)$$

$$(x - 1)(x - 3)$$

$$x^2 - 3x - 1x + 3$$

$$x^2 - 4x + 3$$

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c.

Intercept Form

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

Standard Form

$y = x^2 - 4$

Vertex Form

$y = x^2 - 4$

$y = (x-0)^2 - 4$

Standard Form

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d.
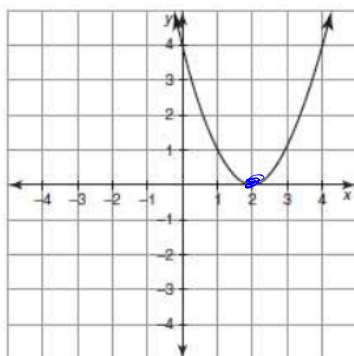
Intercept Form

$x = 2 \qquad x = 2$

$y = (x-2)(x-2)$

Standard Form

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

Vertex Form $\overset{h\ k}{(2,0)}$

$y = (x-2)^2$

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

$y = 1(x-2)^2 + 0$

Standard Form

x	x^2	$-2x$
-2	$-2x$	$+4$

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e.
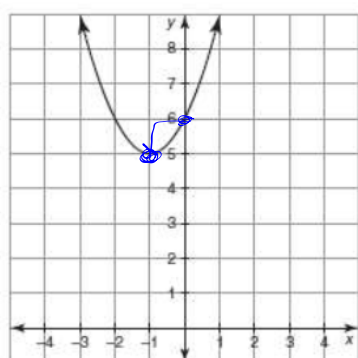
x int
Intercept Form

None
Cant Do

Standard Form

x	x^2	$1x$
1	$1x$	1

Vertex Form $\overset{h\ k}{(-1,5)}$

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

$y = (x+1)^2 + 5$

Standard Form

$y = (x+1)^2 + 5$

$y = (x+1)(x+1) + 5$

$y = x^2 + 2x + 1 + 5$

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

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Algebra 1   Unit 8: Quadratic Functions   Notes

Converting between Forms

$$y = ax^2 + bx + c \quad to \quad y = a(x + \#)(x - \#)$$

Standard to Factored – Factor your expression(factor by GCF and/or into two binomials)

a. $y = x^2 + 4x - 12$

$$y = (x + 6)(x - 2)$$

$$3, 4$$
$$6, 2$$
$$12, 1$$

b. $y = \dfrac{3x^2}{3x} - \dfrac{6x}{3x}$

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

① GCF
② ( )( )

$$y = a(x - \#)(x - \#) \quad to \quad y = ax^2 + bx + c$$

Factored to Standard – Multiply your expressions together and place in standard form. Multiply a value through last.

a. $y = (x - 3)(x + 4)$

	x	4
x	x^2	$4x$
-3	$-3x$	-12

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

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

Vertex to Standard – Expand your squared binomial, multiply the binomials, and add constants. Multiply a value through last.

a. $y = (x - 5)^2 - 12$

b. $y = -3(x + 1)^2 + 4$

Standard to Vertex - Determine your vertex (h, k) and keep the same a-value.

a. $y = x^2 + 4x + 3$

b. $y = x^2 + 6x - 5$

Practice

Algebra 1 Unit 8: Quadratic Functions Practice
Day 9.5 – Converting Between Forms **Name:** _____

Practice Assignment **Date:** _____ **Block:** _____

Directions: Convert from intercept form to standard form. Then name the y-intercept.

a. $y = (x - 3)(x + 4)$ b. $y = -(x - 1)(x - 5)$ c. $y = 2(x + 5)(x + 1)$

Form: _____   Form: _____   Form: _____

Y-int: _____   Y-int: _____   Y-int: _____

Directions: Convert from vertex form to standard form. Then name the y-intercept.

a. $y = (x + 5)^2 - 2$ b. $y = -(x - 2)^2 + 6$ c. $y = -3(x - 1)^2 + 4$

Form: _____   Form: _____   Form: _____

Y-int: _____   Y-int: _____   Y-int: _____

Directions: Convert from standard form to intercept form. Then name the x-intercepts.

a. $y = x^2 + 2x - 15$ b. $y = x^2 - 5x - 14$ c. $y = -x^2 + 3x + 4$

Form: _____   Form: _____   Form: _____

X-int: _____   X-int: _____   X-int: _____

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Directions: Convert from standard form to vertex form. Then name the vertex.

a. $y = x^2 - 10x + 27$ b. $y = -x^2 + 6x - 8$ c. $y = -2x^2 - 24x - 75$

Form: _____   Form: _____   Form: _____

Vertex: _____   Vertex: _____   Vertex: _____

Directions: Convert from intercept form to vertex form. Then name the vertex.

a. $y = (x - 6)(x - 2)$ b. $y = -(x - 5)(x - 3)$ c. $y = \frac{1}{2}(x - 2)(x + 6)$

Form: _____   Form: _____   Form: _____

Vertex: _____   Vertex: _____   Vertex: _____

Attachments

Syllabus - Math I A.doc