vertex form of a quadratic equation

agenda

Warm-Up

Discovery Activity

HW #1-10

reminders

TEST Thurs!

All HW due Friday!!

SB next week!!!

essential question

How do I write the equation of a quadratic in vertex form?

warm-up monday

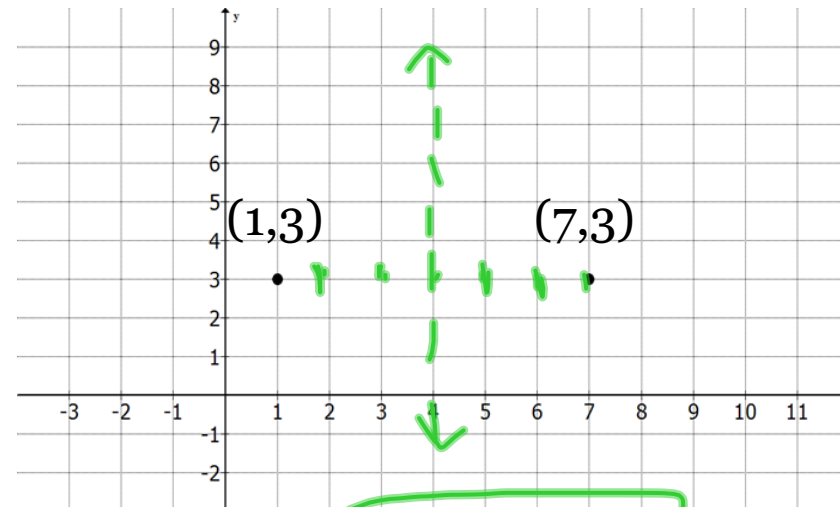1. What is the parent function of $f(x) = -2(x+4)^2 - 4$?

A. $y = x$

B. $y = x^2$ Quadratic

C. $y = (x+4)^2$

D. $y = -x^2$

2. Two points on the graph of a quadratic function are shown on the grid. What is the equation for the axis of symmetry of the graph of this function?

(1,3)   (7,3)

$x = 4$

vertex form of a quadratic equation p.91

essential question How do I write the equation of a quadratic in vertex form?

Directions: The equation $y = a(x - h)^2 + k$ is the vertex form of a quadratic equation. For each vertex form below, identify h and k and then use your calculator to find the vertex of the quadratic.

Vertex Form $y = a(x - h)^2 + k$	(h, k)	Minimum or Maximum?	Vertex
$y = (x - 2)^2 + 0$	$(2, 0)$	minimum	$(2, 0)$
$y = (x - h)^2 + 1$ $y = (x + 3)^2 - 1$	$(-3, -1)$	minimum	$(-3, -1)$
$y = -3(x + 2)^2 + 4$	$(-2, 4)$	Maximum	$(-2, 4)$
$y = 2(x + 3)^2 + 1$	$(-3, 1)$	minimum	$(-3, 1)$

1. Compare the vertex of each quadratic function to each ordered pair (h, k). What do you notice?

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essential question How do I write the equation of a quadratic in vertex form?

2. Use your observations from #1 to find the vertex of each of the quadratics below. **Do not use your** calculator. $y = a(x-h)^2 + k$

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

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

$(-4, -2)$

B. $y = a(x+3)^2 + 2$

$(-3, 2)$

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

$(-5, 2)$

Vertex Form of a Quadratic Equation: ___$y = a(x-h)^2 + k$___

3. Write a quadratic equation in vertex form with $a=1$ that has the listed vertex. (h, k)

a. (2,1) $h \quad k$

b. (-3,4) $h \quad k$

c. (-4, -10)

d. (5, -6)

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

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

$y = (x+3)^2 + 4$

exit ticket

essential question How do I write the equation of a quadratic in vertex form?

EXIT TICKET

Name: _____

1. Find the vertex of the parabola represented by $y = -4(x-2)^2 + 2$

   a. (2,2)
   b. (-2,2)
   c. (-2,-2)
   d. (2,-2)

2. Which of the following quadratic equations has a vertex at (2, 1)?

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

3. Write a quadratic equation in vertex form with a=1 that has a vertex of (-4, 5).

Algebra I Unit 8– Writing Equations of Quadratics

Student Practice – Vertex Form of a Quadratic

Name _____ Date _____ Period _____

Name the vertex of the following parabolas.

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

3. $y = \frac{1}{2}(x - 12)^2 - 15$

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

4. $y = -2(x + 9)^2 - 20$

Write the equation of a parabola with a=1 that has the vertex at the point listed.
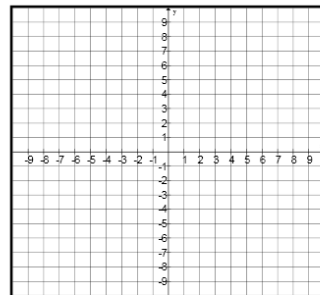
5. (2, 1)

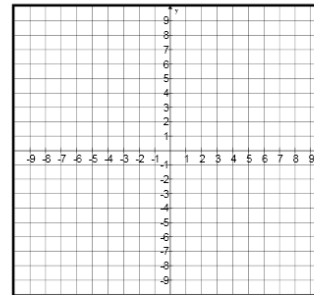7. (-8, -4)

6. (-4, 5)

8. (1, -9)

Graph the following parabolas.

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

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

Vertex: _____
Minimum or Maximum
Concave Up or Concave Down
Axis of Symmetry: _____

Vertex: _____
Minimum or Maximum
Concave Up or Concave Down
Axis of Symmetry: _____
X-intercepts: _____ and _____

hw help: vertex form

no work = no credit = no kidding!

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

#1-4. Use the formula above! Remember, the INSIDE of parenthesis are OPPOSITE.

#5-8. Plug in each vertex to the formula! A double negative will make a plus! Inside of parenthesis are opposite!

#9. Use your transformation knowledge to graph! The vertex should be at (2,1) and the graph has no stretches or reflections.

#10. You try! You can always check the graph in your calculator.