| Name: | Date: |
|---------------------|----------------|
| Quadratic Equations | Class: Algebra |

Topic: Quadratic Equations in Vertex Form

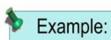
Model #1



The vertex form of a quadratic function is given by $f(x) = a(x - h)^2 + k$, where (h, k) is the vertex of the parabola.

• To Convert from $f(x) = ax^2 + bx + c$ Form to Vertex Form: Method 1: Completing the Square

To convert a quadratic from $y = ax^2 + bx + c$ form to vertex form, $y = a(x - h)^2 + k$, you use the process of completing the square. Let's see an example.



Convert $y = 2x^2 - 4x + 5$ into vertex form, and state the vertex.

| Vertex form: _ | | |
|-----------------|--|--|
| _ | | |
| The vertex is a | | |

Model #2

Definition:

The vertex form of a quadratic function is given by $f(x) = a(x - h)^2 + k$, where (h, k) is the vertex of the parabola.

 $y = x^2 - 2x - 5$ Into vertex form, then state the vertex.

Vertex form:

The vertex is :_____

Model #3

Convert $y = -x^2 - 14x - 59$ into vertex form, then state the vertex.

| Vertex form: | |
|-----------------|--|
| The vertex is : | |

CFU_Think-Pair-Share

 Which equation and ordered pair represent the correct vertex form and vertex for

$$j(x) = x^2 - 12x + 7?$$

1)
$$j(x) = (x-6)^2 + 43, (6,43)$$

2)
$$j(x) = (x-6)^2 + 43, (-6,43)$$

3)
$$j(x) = (x-6)^2 - 29, (6,-29)$$

4)
$$j(x) = (x-6)^2 - 29, (-6,-29)$$

Guided Practice

For each parabola, first find the vertex by using x = -b/2a. Then, convert the function into vertex form by completing the square. Do you get the same vertex in its new form?

a.
$$f(x) = x^2 - 8x + 11$$

b.
$$g(x) = x^2 + 26x + 68$$

Independent Practice Show all of your work on a separate sheet of paper.

1. Convert from standard form to vertex form. 2. Identify vertex and axis of symmetry. (Work on notebook paper & answer in box)

1.
$$4x^2 + 40x + 3 = 0$$

2.
$$-x^2 + 6x + 4 = 0$$

3.
$$x^2 + 4x + 2 = 0$$

4.
$$-2x^2 + 4x + 11 = 0$$
 5. $3x^2 - 6x + 8 = 0$ 6. $-4x^2 - 24x + 9 = 0$

5.
$$3x^2 - 6x + 8 = 0$$

6.
$$-4x^2 - 24x + 9 = 0$$

7.
$$-x^2 - 10x + 4 = 0$$

8.
$$2x^2 + 20x + 1 = 0$$

8.
$$2x^2 + 20x + 1 = 0$$
 9. $-x^2 - 2x + 11 = 0$

10.
$$-3x^2 + 6x - 4 = 0$$

11.
$$-2x^2 + 4x - 5 = 0$$

12.
$$2x^2 - 16x - 3 = 0$$

13.
$$x^2 - 4x + 2 = 0$$

14.
$$3x^2 + 18x + 5 = 0$$

14.
$$3x^2 + 18x + 5 = 0$$
 15. $4x^2 - 40x - 1 = 0$