Name: _____ Date: _____

Quadratic Equations Class: **Algebra**

Topic: Quadratic Equations in Vertex Form

Model #1

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.

- 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.

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

Vertex form: _____

The vertex is :_____

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.

Convert $y = x^2 - 2x - 5$ 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

1. 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. $-4x^2 - 24x + 9 = 0$
7. $-x^2 - 10x + 4 = 0$
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. $3x^2 + 18x + 5 = 0$
15. $4x^2 - 40x - 1 = 0$