Converting from Vertex Form to Standard Form

| **Vertex Form:** $y = a(x - h)^2 + k$ | **Standard Form:** $ax^2 + bx + c = 0$ |

To change a quadratic from vertex form to standard form:
1- Rewrite quadratic in expanded form.
2- Multiply your binomials using the distributive property.
3- If there is an "a" multiply it through parentheses.
4- Combine like terms.

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

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

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

Converting from Standard Form to Vertex Form

1- Find the vertex. Find "x" using vertex formula. Find "y" by plugging x value into equation.

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

2- Substitute a, h, and k into vertex form. $y = a(x - h)^2 + k$

Ex. 1 $y = x^2 - 8x + 7$

Ex. 2 $y = -2x^2 - 4$

Ex. 3 $y = 4x^2 + 8x - 9$