

**Advanced Math**  
**Worksheet—Vertex Form to Standard Form**

Name \_\_\_\_\_  
 Date \_\_\_\_\_ Hour \_\_\_\_\_

We have been working with quadratic equations in Vertex Form,  $y = a(x - h)^2 + k$ . However, it is more common for quadratic equations to be given to us in Standard Form,  $y = ax^2 + bx + c$ . Today's assignment is for you to practice using FOIL to change equations from Vertex Form into Standard Form. Use the example below to guide your work.

Example:

$$y = -2(x + 3)^2 - 5$$

$$y = -2(x^2 + 6x + 9) - 5$$

$$y = -2x^2 - 12x - 18 - 5$$

$$y = -2x^2 - 12x - 23$$

Given.  
 Multiply the quantity squared. (FOIL)  
 Distribute the  $a$ .  
 Combine like terms.

|    |                |     |
|----|----------------|-----|
| ·  | x              | +3  |
| x  | x <sup>2</sup> | +3x |
| +3 | +3x            | +9  |

or

$$x^2 + 3x + 3x + 9$$

Problems:

|                                    |                                   |                                    |
|------------------------------------|-----------------------------------|------------------------------------|
| 1. $y = 6(x - 4)^2 - 1$            | 2. $y = \frac{1}{2}(x + 4)^2 + 6$ | 3. $y = -5(x - 1)^2 + 4$           |
| 4. $y = -\frac{1}{3}(x + 6)^2 - 1$ | 5. $y = 4(x + 2)^2 - 8$           | 6. $y = \frac{-2}{3}(x - 9)^2 - 2$ |
| 7. $y = (x - 2)^2 + 7$             | 8. $y = (x + \frac{1}{2})^2 - 2$  | 9. $y = 18(x - \frac{1}{3})^2 + 5$ |
| 10. $y = -2(x + \frac{1}{2})^2$    | 11. $y = 13(x - 2)^2 + 15$        | 12. $y = 2(x + 8)^2 + 10$          |