Name:_____Answer Key_____ Date: _____ Period: _____

ALGEBRA 2   QUADRATIC FUNCTIONS AND EQUATIONS   CHAPTER 4 TEST

1. Use the function $y = (x+4)^2 - 3$ to complete the following:

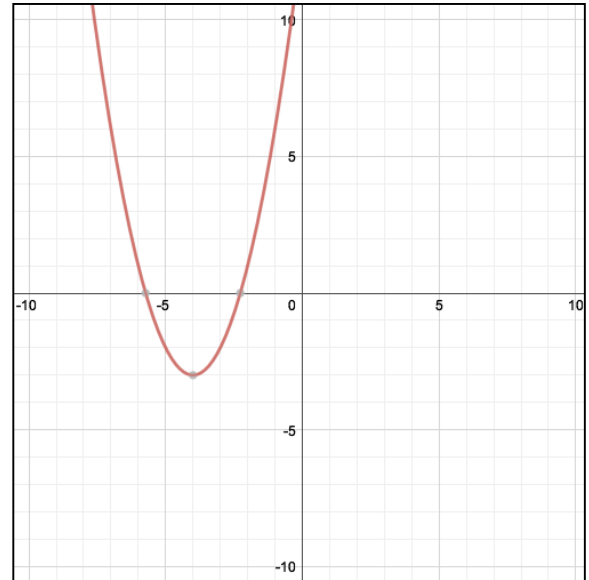   a. Graph the function.

   b. Identify the vertex.

      (-4, -3)

   c. Identify the axis of symmetry.

      x = -4

   d. Identify the maximum or minimum.

      -3

   e. Describe each transformation from the parent function y = x^2.

      The graph shifts to the left 4 units and down 3 units

2. Use the function $y = x^2 - 4x + 4$ to complete the following:
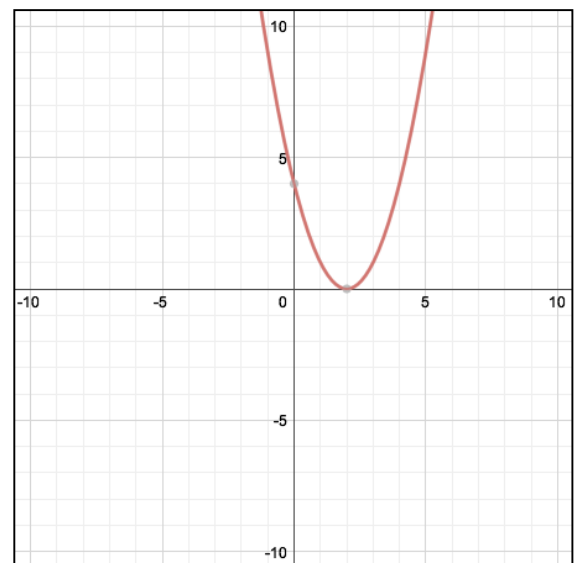
   a. Graph the function.

   b. Identify the vertex.

      (2, 0)

   c. Identify the axis of symmetry.

      x = 2

   d. Identify the maximum or minimum.

      0

   e. Describe each transformation from the parent function y = x^2.

      The graph shifts to the right 2 units

What is the expression in factored form?

3. $x^2 - 8x + 15$

4. $3x^2 + 27x + 54$

5. $x^2 - 9$

(x − 3)(x − 5)

3(x + 3)(x + 6)

(x + 3)(x − 3)

Solve the quadratic equation by **FACTORING**.

6. $x^2 + 11x = -24$

x = -8, -3

Solve the quadratic equation by **SQUARE ROOT METHOD**.

7. $2x^2 = 10$

$x = \pm\sqrt{5}$

Solve the quadratic equation by **COMPLETING THE SQUARE**.

8. $x^2 + 10x + 15 = 0$

$x = -5 \pm \sqrt{10}$

Use the **QUADRATIC FORMULA** to solve the equation.

9. $x^2 - 7x = 9$

$$x = \frac{7 \pm \sqrt{85}}{2}$$

Simplify the number using the imaginary unit i.

10. $\sqrt{-81}$

$9i$

11. $\sqrt{-27}$

$3i\sqrt{3}$

Simplify the expression.

12. $(4 - i) + (-3 - 4i)$

$1 - 5i$

13. $(2 + 2i) - (6 - 6i)$

$-4 + 8i$

14. $(-i)(8i)$

8

15. $(-2 + 4i)(-2 - 5i)$

$24 + 2i$

Solve the quadratic equation.

16. $16x^2 = -9$

$$x = \pm \frac{3}{4}i$$

Bonus: Solve by COMPLETING THE SQUARE.
$9x^2 - 12x - 2 = 0$

$$x = \frac{2 \pm \sqrt{6}}{3}$$