Lesson 6 Practice Problems

1. Suppose a classmate missed the lessons on completing the square to find the center and radius of a circle. Explain the process to them. If it helps, use a problem you've already done as an example.

2. Match each expression with the value needed in the box in order for the expression to be a perfect square trinomial.

   A. $x^2 - 8x + \square$

   B. $x^2 + 20x + \square$

   C. $x^2 - 16x + \square$

   D. $x^2 + 9x + \square$

   1. 16

   2. 20.25

   3. 64

   4. 100

3. Find the center and radius of the circle represented by the equation $x^2 + y^2 + 4x - 10y + 20 = 0$.

4. Select **all** the expressions that can be factored into a squared binomial.

    A. $y^2 + 2y + 1$

    B. $w^2 + 5w + \frac{25}{4}$

    C. $y^2 - 10y + 5$

   D. $x^2 - 10x + 25$

    E. $x^2 + 10x + 25$

    F. $w^2 + 20w + 40$

(From Unit 6, Lesson 5.)

5. An equation of a circle is given by $(x + 3)^2 + (y - 9)^2 = 5^2$. Apply the distributive property to the squared binomials and rearrange the equation so that one side is 0.

(From Unit 6, Lesson 5.)

6. a. Graph the circle
    $(x + 1)^2 + (y - 3)^2 = 16$.

    b. Find the distance from the center of
    the circle to each point on the list.
        i. $(2, 1)$

        ii. $(4, 1)$

        iii. $(3, 3)$

    c. What do these distances tell you
    about whether each point is inside,
    on, or outside the circle?
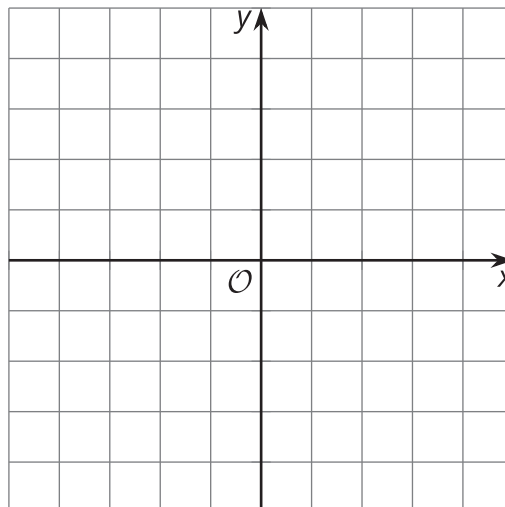
(From Unit 6, Lesson 4.)

7. The triangle whose vertices are $(3, \text{-}1), (2, 4)$, and $(5, 1)$ is transformed by the rule
$(x, y) \to (2x, 5y)$. Is the image similar or congruent to the original figure?

    A. The image is congruent to the original triangle.

    B. The image is similar but not congruent to the original triangle.

    C. The image is neither similar nor congruent to the original triangle.

(From Unit 6, Lesson 3.)

8. A cube has side length 3 inches. A sphere has a radius of 3 inches.

    a. Before doing any calculations, predict which solid has greater surface area to
    volume ratio.

    b. Calculate the surface area, volume, and surface area to volume ratio for each
    solid.

(From Unit 5, Lesson 16.)