Lesson 20 Practice Problems

1. Decide whether each number is rational or irrational.

   10 $\quad \frac{4}{5} \quad \sqrt{4} \quad \sqrt{10} \quad$ -3 $\quad \sqrt{\frac{25}{4}} \quad \sqrt{0.6}$

2. Here are the solutions to some quadratic equations. Select **all** solutions that are rational.

   A. 5 ± 2

   B. $\sqrt{4} \pm 1$

   C. $\frac{1}{2} \pm 3$

   D. $10 \pm \sqrt{3}$

   E. $\pm\sqrt{25}$

   F. $1 \pm \sqrt{2}$

3. Solve each equation. Then, determine if the solutions are rational or irrational.

   a. $(x + 1)^2 = 4$

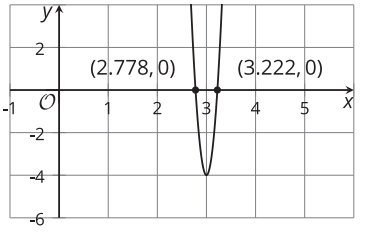
   b. $(x - 5)^2 = 36$

   c. $(x + 3)^2 = 11$

   d. $(x - 4)^2 = 6$

4. Here is a graph of the equation $y = 81(x-3)^2 - 4$.

a. Based on the graph, what are the solutions to the equation $81(x-3)^2 = 4$?



b. Can you tell whether they are rational or irrational? Explain how you know.

c. Solve the equation using a different method and say whether the solutions are rational or irrational. Explain or show your reasoning.

5. Match each equation to an equivalent equation with a perfect square on one side.

A. $x^2 - 9x = \frac{1}{2}$

B. $x^2 + 6.4x - 8.9 = 0$

C. $x^2 - 5x = 11$

D. $x^2 + 0.1x + 0.0005 = 0$

E. $x^2 - \frac{6}{7}x = \frac{1}{49}$

F. $x^2 + 1.21x = 6.28$

1. $(x - 2.5)^2 = 17.25$

2. $(x - \frac{9}{2})^2 = \frac{83}{4}$

3. $(x - \frac{3}{7})^2 = \frac{10}{49}$

4. $(x + 0.05)^2 = 0.002$

5. $(x + 3.2)^2 = 19.14$

6. $(x + 0.605)^2 = 6.646025$

(From Unit 7, Lesson 13.)

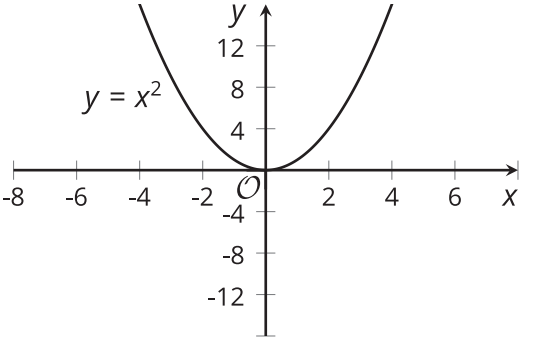
6. To derive the quadratic formula, we can multiply $ax^2 + bx + c = 0$ by an expression so that the coefficient of x^2 is a perfect square and the coefficient of x is an even number.

   a. Which expression, a, $2a$, or $4a$, would you multiply $ax^2 + bx + c = 0$ by to get started deriving the quadratic formula?

   b. What does the equation $ax^2 + bx + c = 0$ look like when you multiply both sides by your answer?

(From Unit 7, Lesson 19.)

7. Here is a graph that represents $y = x^2$.



   On the same coordinate plane, sketch and label the graph that represents each equation:

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

   b. $y = 2x^2 + 4$

(From Unit 6, Lesson 12.)

8. Which quadratic expression is in vertex form?

   A. $x^2 - 6x + 8$

   B. $(x - 6)^2 + 3$

   C. $(x - 3)(x - 6)$

   D. $(8 - x)x$

(From Unit 6, Lesson 15.)

9. Function f is defined by the expression $\frac{5}{x-2}$.

   a. Evaluate $f(12)$.

   b. Explain why $f(2)$ is undefined.

   c. Give a possible domain for f.

(From Unit 4, Lesson 10.)