

Lesson 17 Practice Problems

1. Select all the equations that have 2 solutions.

A. $(x + 3)^2 = 9$

B. $(x - 5)^2 = -5$

C. $(x + 2)^2 - 6 = 0$

D. $(x - 9)^2 + 25 = 0$

E. $(x + 10)^2 = 1$

F. $(x - 8)^2 = 0$

G. $5 = (x + 1)(x + 1)$

2. A frog jumps in the air. The height, in inches, of the frog is modeled by the function $h(t) = 60t - 75t^2$, where t is the time after it jumped, measured in seconds.

Solve $60t - 75t^2 = 0$. What do the solutions tell us about the jumping frog?

3. A tennis ball is hit straight up in the air, and its height, in feet above the ground, is modeled by the equation $f(t) = 4 + 12t - 16t^2$, where t is measured in seconds since the ball was thrown.

a. Find the solutions to the equation $0 = 4 + 12t - 16t^2$.

b. What do the solutions tell us about the tennis ball?

4. Rewrite each quadratic expression in standard form.

a. $(x + 1)(7x + 2)$

b. $(8x + 1)(x - 5)$

c. $(2x + 1)(2x - 1)$

d. $(4 + x)(3x - 2)$

(From Unit 7, Lesson 10.)

5. Find the missing expression in parentheses so that each pair of quadratic expressions is equivalent. Show that your expression meets this requirement.

a. $(4x - 1)(\underline{\hspace{2cm}})$ and $16x^2 - 8x + 1$

b. $(9x + 2)(\underline{\hspace{2cm}})$ and $9x^2 - 16x - 4$

c. $(\underline{\hspace{2cm}})(-x + 5)$ and $-7x^2 + 36x - 5$

(From Unit 7, Lesson 10.)

6. The number of downloads of a song during a week is a function, f , of the number of weeks, w , since the song was released. The equation $f(w) = 100,000 \cdot \left(\frac{9}{10}\right)^w$ defines this function.

a. What does the number 100,000 tell you about the downloads? What about the $\frac{9}{10}$?

b. Is $f(-1)$ meaningful in this situation? Explain your reasoning.

(From Unit 5, Lesson 9.)

7. Consider the equation $4x^2 - 4x - 15 = 0$.

a. Identify the values of a , b , and c that you would substitute into the quadratic formula to solve the equation.

b. Evaluate each expression using the values of a , b , and c .

$-b$	b^2	$4ac$	$b^2 - 4ac$
$\sqrt{b^2 - 4ac}$	$-b \pm \sqrt{b^2 - 4ac}$	$2a$	$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

c. The solutions to the equation are $x = -\frac{3}{2}$ and $x = \frac{5}{2}$. Do these match the values of the last expression you evaluated in the previous question?

(From Unit 7, Lesson 16.)

8. a. Describe the graph of $y = -x^2$. (Does it open upward or downward? Where is its y -intercept? What about its x -intercepts?)

b. Without graphing, describe how adding $16x$ to $-x^2$ would change each feature of the graph of $y = -x^2$. (If you get stuck, consider writing the expression in factored form.)

- i. the x -intercepts
- ii. the vertex
- iii. the y -intercept
- iv. the direction of opening of the U-shape graph

(From Unit 6, Lesson 13.)