

# 3. Practice

## Assignment Guide

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- 2 Objective**  
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You are now familiar with five methods of solving quadratic equations: finding square roots, factoring, graphing, completing the square, and using the Quadratic Formula. For  $ax^2 = c$ , finding square roots works best. The discriminant can help you decide how to solve equations that have an  $x$ -term.

### Key Concepts

### Summary Methods for Solving Quadratic Equations

Discriminant	Methods
positive square number	<ul style="list-style-type: none"> <li>factoring, graphing, Quadratic Formula, or completing the square</li> </ul>
positive nonsquare number	<ul style="list-style-type: none"> <li>for approximate solutions: graphing, Quadratic Formula, or completing the square</li> <li>for exact solutions: Quadratic Formula or completing the square</li> </ul>
zero	<ul style="list-style-type: none"> <li>factoring, graphing, Quadratic Formula, or completing the square</li> </ul>
negative	<ul style="list-style-type: none"> <li>Quadratic Formula or completing the square</li> </ul>

## EXERCISES

### Practice and Problem Solving

For more practice, see *Extra Practice*.

#### Practice by Example

**Example 1**  
(page 286)

- Solve each equation using the Quadratic Formula. 1–21. See margin pp. 288–289.
- ✓1.  $x^2 - 4x + 3 = 0$       2.  $x^2 + 8x + 12 = 0$       3.  $2x^2 + 5x - 7 = 0$   
 4.  $3x^2 + 2x - 1 = 0$       5.  $x^2 + 10x = -25$       ✓6.  $2x^2 + 3x - 5 = 0$   
 7.  $x^2 = 3x - 1$       8.  $x^2 + 6x - 5 = 0$       9.  $3x^2 - 4x - 2 = 0$   
 ✓10.  $8x^2 - 2x - 3 = 0$       11.  $x(x - 5) = -4$       ✓12.  $9x^2 + 12x - 5 = 0$

**Example 2**  
(page 286)

13.  $x^2 - 6x + 11 = 0$       14.  $x^2 = 2x - 5$       15.  $x^2 + 3x + 5 = 0$   
 16.  $2x^2 + 8x + 12 = 0$       17.  $x^2 - 2x + 3 = 0$       18.  $3x^2 + 4x + 10 = 0$   
 19.  $-x^2 + 5x - 7 = 0$       20.  $2x^2 = 7x - 8$       21.  $15x^2 + 2x + 1 = 0$

**Example 3**  
(page 287)

Solve each equation using the Quadratic Formula. Find the exact solutions. Then approximate any radical solutions. Round to the nearest hundredth.

- ✓22.  $2x^2 - 5x - 3 = 0$       23.  $3x^2 - 10x + 5 = 0$       24.  $3x^2 + 4x - 3 = 0$   
 ✓25.  $6x^2 - 5x - 1 = 0$       26.  $7x^2 - x - 12 = 0$       27.  $5x^2 + 8x - 11 = 0$   
 28.  $4x^2 + 4x = 22$       29.  $2x^2 - 1 = 5x$       30.  $2x^2 + x = \frac{1}{2}$

**Examples 4 and 5**  
(page 288)

Evaluate the discriminant of each equation. Tell how many solutions each equation has and whether the solutions are real or imaginary. 31–39. See margin.

31.  $x^2 + 4x + 5 = 0$       32.  $x^2 - 4x - 5 = 0$       33.  $4x^2 + 20x + 25 = 0$   
 34.  $2x^2 + x + 28 = 0$       35.  $2x^2 + 7x - 15 = 0$       36.  $6x^2 - 2x + 5 = 0$   
 37.  $2x^2 + 7x = -6$       38.  $x^2 - 12x + 36 = 0$       39.  $x^2 = 8x - 16$

Lesson 5-8 The Quadratic Formula 289

- $-\frac{1}{15} \pm \frac{i\sqrt{14}}{15}$   
 $-\frac{1}{2}, 3$   
 $\frac{5}{3} \pm \frac{\sqrt{10}}{3}; 0.61, 2.72$   
 $-\frac{2}{3} \pm \frac{\sqrt{13}}{3}; -1.87, 0.54$

25.  $-\frac{1}{6}, 1$   
 26.  $\frac{1}{14} \pm \frac{\sqrt{337}}{14}; -1.24, 1.38$   
 27.  $-\frac{4}{5} \pm \frac{\sqrt{71}}{5}; -2.49, 0.89$   
 28.  $-\frac{1}{2} \pm \frac{\sqrt{23}}{2}; -2.90, 1.90$

29.  $\frac{5}{4} \pm \frac{\sqrt{33}}{4}; -0.19, 2.69$   
 30.  $-\frac{1}{4} \pm \frac{\sqrt{5}}{4}; -0.81, 0.31$   
 31.  $-4$ ; two, imaginary  
 32.  $36$ ; two, real

### Error Prevention

**Exercises 31–39** Watch for students who describe the solutions as complex numbers rather than imaginary numbers. At this stage *all* numbers are complex numbers.

#### Enrichment 5-8

#### Reteaching 5-8

#### Practice 5-8

**Practice 5-8**

Evaluate the discriminant of each equation. Tell how many solutions each equation has and whether the solutions are real or imaginary.

1.  $y = x^2 + 16x - 25$       2.  $y = x^2 + 10x + 10$       3.  $y = x^2 - 24x$   
 4.  $y = 4x^2 - 4x + 1$       5.  $y = 4x^2 - 5x + 1$       6.  $y = -2x^2 + 3x - 5$   
 7.  $y = x^2 + 3x + 4$       8.  $y = x^2 + 3x - 3$       9.  $y = -2x^2 + 3x - 5$   
 10.  $y = x^2 - 5x + 4$       11.  $y = x^2 + 12x + 36$       12.  $y = x^2 + 2x + 3$   
 13.  $y = 2x^2 - 13x - 7$       14.  $y = -5x^2 + 6x - 4$       15.  $y = -4x^2 - 4x - 3$

Solve each equation using the Quadratic Formula.

16.  $x^2 + 6x + 9 = 0$       17.  $x^2 - 15x + 56 = 0$       18.  $3x^2 - 5x + 2 = 0$   
 19.  $2x^2 + 3x + 5 = 0$       20.  $10x^2 - 25x + 12 = 0$       21.  $4x^2 + x - 3 = 0$   
 22.  $x^2 + 8x + 15 = 0$       23.  $3x^2 + 2x + 1 = 0$       24.  $4x^2 + 4x + 3 = 0$   
 25.  $x^2 - 4x - 12 = 0$       26.  $x^2 = 3x + 2$       27.  $3x^2 + 5x - 2 = 0$   
 28.  $x^2 + 6x - 4 = 0$       29.  $x^2 + 2x - 5 = 0$       30.  $2x^2 + 7x - 4 = 0$   
 31.  $2x^2 + 4x + 3 = 0$       32.  $x^2 - 18x + 80 = 0$       33.  $x^2 + 7x - 10 = 0$   
 34.  $x^2 + 6x + 25 = 0$       35.  $4x^2 + 13x + 12 = 0$       36.  $3x^2 + 5x - 12 = 0$   
 37.  $3x^2 + 4x + 5 = 0$       38.  $3x^2 + 3x - 7 = 0$       39.  $3x^2 + 2x + 1 = 0$   
 40.  $5x^2 + x + 3 = 0$       41.  $5x^2 + x + 3 = 0$       42.  $3x^2 + 2x + 1 = 0$   
 43.  $x^2 - 2x + 3 = 0$       44.  $-2x^2 + 3x + 24 = 0$       45.  $4x^2 - 5x - 6 = 0$   
 46.  $x^2 + 6x + 5 = 0$       47.  $x^2 - 6x - 8 = 0$

Solve.

48. A model of the daily profits  $p$  of a gas station based on the price per gallon  $p$  is  $p = -15,000p^2 + 54,000p - 16,200$ . Use the discriminant to find whether the station can profit \$500 per day.

Solve each equation using the Quadratic Formula. Find the exact solutions. Then approximate any radical solutions. Round to the nearest hundredth.

50.  $x^2 - 2x - 3 = 0$       51.  $x^2 + 3x + 4 = 0$       52.  $x^2 - 2x - 8 = 0$   
 53.  $7x^2 - 12x + 3 = 0$       54.  $5x^2 + 9x + 4 = 0$       55.  $4x^2 + 5x + 1 = 0$   
 56.  $4x^2 + 5x - 4 = 0$       57.  $x^2 + 6x = 0$       58.  $x^2 - 13x + 40 = 0$   
 59.  $2x^2 + 5x = 0$       60.  $2x^2 + 3x - 20 = 0$       61.  $x^2 - 4x + 1 = 0$   
 62.  $3x^2 - 6x - 7 = 0$       63.  $x^2 - 10x = 0$       64.  $x^2 + 7x + 10 = 0$

Algebra 2 Chapter 5 Lesson 5-8 Practice

33. 0; one, real  
 34.  $-223$ ; two, imaginary  
 35.  $169$ ; two, real  
 36.  $-116$ ; two, imaginary  
 37. 1; two, real  
 38. 0; one, real  
 39. 0; one, real