

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Practice 5-7****Completing the Square****Complete the square.**

1.  $x^2 + 6x + \blacksquare$       2.  $x^2 - 7x + \blacksquare$       3.  $x^2 + 12x + \blacksquare$       4.  $x^2 + 3x + \blacksquare$   
 5.  $x^2 - 8x + \blacksquare$       6.  $x^2 + 16x + \blacksquare$       7.  $x^2 + 21x + \blacksquare$       8.  $x^2 - 2x + \blacksquare$

**Rewrite each equation in vertex form. Then find the vertex.**

9.  $y = x^2 + 4x - 6$       10.  $y = x^2 - 6x + 6$       11.  $y = 4x^2 + 8x - 4$   
 12.  $y = 4x^2 + 4x + 1$       13.  $y = 2x^2 + 4x - 5$       14.  $y = -3x^2 - 4x - 1$   
 15.  $y = -3x^2 + 3x - 1$       16.  $y = x^2 + 2x + 1$       17.  $y = -5x^2 + 10x + 1$   
 18.  $y = -2x^2 + 4x + 3$       19.  $y = x^2 + 5x + \frac{5}{4}$       20.  $y = -2x^2 + 10x - 11$   
 21.  $y = 6x^2 - 12x + 1$       22.  $y = -2x^2 + 8x - 9$       23.  $y = 3x^2 + 9x + 6$

**Solve each quadratic equation by completing the square.**

24.  $x^2 + 12x + 4 = 0$       25.  $x^2 - x - 5 = 0$       26.  $3x^2 = -12x - 3$   
 27.  $x^2 - x - 1 = 0$       28.  $4x^2 - 8x + 1 = 0$       29.  $5x^2 = 8x - 6$   
 30.  $2x^2 - 4x - 3 = 0$       31.  $x^2 + 11x = 0$       32.  $x^2 = 5x + 14$   
 33.  $2x^2 + x - 1 = 0$       34.  $2x^2 + 6x - 7 = 0$       35.  $2x^2 = -8x + 45$   
 36.  $x^2 = -3x - 3$       37.  $4x^2 = -2x + 1$       38.  $3x^2 = -6x + 9$   
 39.  $x^2 = 7x + 12$       40.  $x^2 = 3x + 7$       41.  $3x^2 = 6x - 9$   
 42.  $x^2 = -3x + 2$       43.  $x^2 = -7x - 1$       44.  $4x^2 = -3x + 2$   
 45.  $2x^2 = 4x - 5$       46.  $2x^2 = 5x + 5$       47.  $2x^2 = 6x + 5$   
 48.  $x^2 = 3x$       49.  $x^2 = 8x$       50.  $4x^2 = -2x - 3$   
 51.  $2x^2 = -2x + 5$       52.  $2x^2 = -5x - 5$       53.  $3x^2 = -5x + 1$   
 54.  $2x^2 = 2x + 4$       55.  $3x^2 = 7x + 8$       56.  $2x^2 = -6x + 4$   
 57.  $x^2 = -7x - 9$       58.  $2x^2 = 5x$       59.  $3x^2 = -42x$   
 60.  $2x^2 = -4x + 5$       61.  $4x^2 = -x + 5$       62.  $3x^2 = -3x + 1$   
 63.  $x^2 = 3x + 4$       64.  $2x^2 = 2x + 8$       65.  $3x^2 = x + 4$

**Solve each equation.**

66.  $x^2 + 2x + 1 = 9$       67.  $3x^2 - 18x + 27 = 125$       68.  $x^2 - 4x + 4 = 5$   
 69.  $x^2 + 3x + \frac{9}{4} = \frac{13}{4}$       70.  $x^2 + 3x + \frac{9}{4} = -\frac{15}{4}$       71.  $x^2 + 3x + \frac{9}{4} = \frac{41}{4}$   
 72.  $x^2 + 7x + \frac{49}{4} = \frac{53}{4}$       73.  $x^2 + 3x + \frac{9}{4} = \frac{29}{4}$       74.  $x^2 - 6x + 9 = 7$

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**Practice 5-8****The Quadratic Formula**

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

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|--------------------------|--------------------------|--------------------------|
| 1. $y = x^2 + 10x - 25$  | 2. $y = x^2 + 10x + 10$  | 3. $y = 9x^2 - 24x$      |
| 4. $y = 4x^2 - 4x + 1$   | 5. $y = 4x^2 - 5x + 1$   | 6. $y = 4x^2 - 3x + 1$   |
| 7. $y = x^2 + 3x + 4$    | 8. $y = x^2 + 7x - 3$    | 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. $y = -4x^2 - 4x - 1$ |

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. $10x^2 - 23x + 12 = 0$ | 21. $4x^2 + x - 5 = 0$  |
| 22. $x^2 + 8x + 15 = 0$ | 23. $3x^2 + 2x + 1 = 0$    | 24. $4x^2 + x + 5 = 0$  |
| 25. $x^2 - 4x - 12 = 0$ | 26. $x^2 = 3x + 2$         | 27. $2x^2 - 5x + 2 = 0$ |
| 28. $x^2 + 6x - 4 = 0$  | 29. $x^2 = 2x - 5$         | 30. $3x^2 + 7 = -6x$    |
| 31. $2x^2 + 6x + 3 = 0$ | 32. $x^2 = -18x - 80$      | 33. $x^2 + 9x - 13 = 0$ |
| 34. $x^2 - 8x + 25 = 0$ | 35. $4x^2 + 13x = 12$      | 36. $3x^2 - 5x = -12$   |
| 37. $3x^2 + 4x + 5 = 0$ | 38. $2x^2 = 3x - 7$        | 39. $5x^2 + 2x + 1 = 0$ |
| 40. $5x^2 + x + 3 = 0$  | 41. $5x^2 + x = 3$         | 42. $5x^2 - 2x + 7 = 0$ |
| 43. $x^2 - 2x + 3 = 0$  | 44. $-2x^2 + 3x = 24$      | 45. $4x^2 = 5x - 6$     |
| 46. $x^2 + 6x + 5 = 0$  | 47. $x^2 - 6x = -8$        | 48. $x^2 - 6x = -6$     |

Solve.

49. A model of the daily profits  $p$  of a gas station based on the price per gallon  $g$  is  $p = -15,000g^2 + 34,500g - 16,800$ . Use the discriminant to find whether the station can profit \$4000 per day. Explain.

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

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|--------------------------|-------------------------|-------------------------|
| 50. $x^2 - 2x - 3 = 0$   | 51. $x^2 + 5x + 4 = 0$  | 52. $x^2 - 2x - 8 = 0$  |
| 53. $7x^2 - 12x + 3 = 0$ | 54. $5x^2 + 5x - 1 = 0$ | 55. $4x^2 + 5x + 1 = 0$ |
| 56. $6x^2 + 5x - 4 = 0$  | 57. $x^2 + x = 6$       | 58. $x^2 - 13x = 48$    |
| 59. $2x^2 + 5x = 0$      | 60. $x^2 + 3x - 3 = 0$  | 61. $x^2 - 4x + 1 = 0$  |
| 62. $9x^2 - 6x - 7 = 0$  | 63. $x^2 - 35 = 2x$     | 64. $x^2 + 7x + 10 = 0$ |