

# 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.

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|--------------------------|----------------------------------|----------------------------|
| 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.

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|-------------------------|-------------------------|-----------------------|
| 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.

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|--|--|---|
| 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. $x^2 - 6x + 9 = 7$                      |