Extra Practice: Skills and Word Problems

Lesson 10-1 **Without graphing, describe how each graph differs from the graph of $y = x^2$.**

1. $y = 3x^2$ **2.** $y = -4x^2$ **3.** $y = -0.5x^2$ **4.** $y = 0.2x^2$

5. $y = x^2 - 4$ **6.** $y = x^2 + 1$ **7.** $y = 2x^2 + 5$ **8.** $y = -0.3x^2 - 7$

Lesson 10-2 **Identify the axis of symmetry and the vertex of each function.**

9. $y = 3x^2$ **10.** $y = -2x^2 + 1$ **11.** $y = 0.5x^2 - 3$

12. $y = -x^2 + 2x + 1$ **13.** $y = 3x^2 + 6x$ **14.** $y = \frac{3}{4}x^2$

15. $y = 2x^2 - 9$ **16.** $y = -5x^2 + x + 4$ **17.** $y = x^2 - 8x$

Graph each quadratic inequality.

18. $y > x^2 - 4$ **19.** $y < 2x^2 + x$ **20.** $y \leq x^2 + x - 2$

Lessons 10-3 and 10-4 **Solve each equation. If the equation has no solution, write *no solution*.**

21. $x^2 = 36$ **22.** $x^2 + x - 2 = 0$ **23.** $c^2 - 100 = 0$

24. $9d^2 = 25$ **25.** $(x - 4)^2 = 100$ **26.** $3x^2 = 27$

27. $2x^2 - 54 = 284$ **28.** $7n^2 = 63$ **29.** $h^2 + 4 = 0$

Lessons 10-5 and 10-6 **Solve each equation. If the equation has no solution, write *no solution*.**

30. $x^2 + 6x - 2 = 0$ **31.** $x^2 - 5x = 7$ **32.** $x^2 - 10x + 3 = 0$

33. $2x^2 - 4x + 1 = 0$ **34.** $3x^2 + x + 5 = 0$ **35.** $\frac{1}{2}x^2 - 3x - 8 = 0$

36. $x^2 + 8x + 4 = 0$ **37.** $x^2 - 2x - 6 = 0$ **38.** $-3x^2 + x - 7 = 0$

39. $x^2 + 5x + 6 = 0$ **40.** $d^2 - 144 = 0$ **41.** $c^2 + 6 = 2 - 4c$

42. $x^2 + 4x = 2x^2 - x + 6$ **43.** $3x^2 + 2x - 12 = x^2$ **44.** $r^2 + 4r + 1 = r$

45. $d^2 + 2d + 10 = 2d + 100$ **46.** $3c^2 + c - 10 = c^2 - 5$ **47.** $t^2 - 3t - 10 = 0$

48. Agriculture You are planting a rectangular garden. It is 5 feet longer than 3 times its width. The area of the garden is 250 ft^2. Find the dimensions of the garden.

Lesson 10-7 **Find the number of solutions of each equation.**

49. $3x^2 + 4x - 7 = 0$ **50.** $5x^2 - 4x = -6$ **51.** $x^2 - 20x + 101 = 1$

52. $2x^2 - 8x + 9 = 4$ **53.** $4x^2 - 5x + 6 = 0$ **54.** $x^2 - 2x + 7 = 0$

Lesson 10-8 **Graph each set of data. Which model is most appropriate for each set?**

55. (2, 4), (4, 4), (1, 2), (5, 1.5) **56.** (3, 8), (4, 6), (5, 5), (6, 4), (7, 3) **57.** (0, 7), (1, 3), (3, 0.5), (2, 1)

● **Lesson 10-1**

58. Water from melting snow drips from a roof at a height of 40 ft. The function $h = -16t^2 + 40$ gives the approximate height h in feet of a drop of water t seconds after it falls. Graph the function.

● **Lesson 10-2 The formula $h = -16t^2 + vt + c$ describes the height of an object thrown into the air, where h is the height, t is the time in seconds, v is the initial velocity, and c is the initial height. Use the formula to answer each question.**

59. A football is thrown with an upward velocity of 15 ft/s from an initial height of 5 feet. How long will it take for the football to reach its maximum height?

60. A ball is thrown from the top of a 50-ft building with an upward velocity of 24 ft/s. When will it reach its maximum height? How far above the ground will it be?

● **Lesson 10-3 Model each problem with a quadratic equation. Then solve. If necessary, round to the nearest tenth.**

61. Find the radius of a circular lid with an area of 12 $in.^2$.

62. Find the side length of a square sandbox with an area of 150 ft^2.

63. Find the diameter of a circular pond with an area of 300 m^2.

● **Lesson 10-4 Answer each question by factoring a quadratic equation.**

64. The length of an open-top box is 4 cm longer than its width. The box was made from a 480-cm^2 rectangular sheet of material with 6 cm-by-6 cm squares cut from each corner. The height of the box is 6 cm. Find the dimensions of the box.

65. Suppose you throw a rugby ball into the air with an initial upward velocity of 29 ft/s and an initial height of 6 ft. The formula $h = -16t^2 + 29t + 6$ gives the ball's height h in feet at time t seconds. Solve the equation for $h = 0$ to find when the ball will hit the ground.

● **Lesson 10-5 Solve by completing the square.**

66. A rectangular patio has a length of $x + 6$ m, a width of $x + 8$ m, and a total area of 400 m^2. Find the dimensions to the nearest tenth.

● **Lessons 10-6 and 10-7**

67. A tennis ball is hit with a vertical velocity of 40 ft/s from an initial height of 7 ft. In how many seconds will the ball hit the ground?

68. A ball is thrown from an initial height of 6 feet at a rate of 42 ft/s to someone standing on a roof 30 feet above the ground. Use the discriminant to determine if the ball will reach the person on the roof.

● **Lesson 10-8**

69. Use a graphing calculator to determine what kind of function best models the data. Let $t = 0$ correspond to the year 2000. Write an equation that models the data.

Bird Population in the Town Park				
2000	2001	2002	2003	2004
225	207	185	168	160