

Chapter 9

Cumulative Review

Solve the equation.

1. $3(2x + 3) = 3(x - 1)$

2. $\frac{|6y - 3|}{3} + 5 = 12$

Solve the inequality. Graph the solution, if possible.

3. $|8h + 4| \leq 36$

4. $-2(y - 3) - 5 \geq -3$

5. $-4|3x + 5| + 2 > 10$

6. In one hour, you can earn 350 points in your favorite video game. You already have 1050 points.

a. Write an inequality where y is the total number of points and x is the number of hours.

b. Your goal is 2450 points. What is the least number of hours needed to reach this goal?

7. Four less than two times a number x is at least 14. Write this sentence as an inequality.

Graph the linear equation or linear inequality.

8. $5x - 7y = 14$

9. $x > 2$

10. $y = 3x - 4$

Write an equation of the line in slope-intercept form that passes through the given point and is perpendicular to the given line.

11. $(-2, 4); y = 2x + 9$

12. $(3, 0); y + 2 = -\frac{1}{4}(x + 9)$

13. $(-8, -12); 18x - 9y = 27$

Solve the system of linear equations by graphing, substitution, or elimination.

14. $y = -2$

15. $5x + 4y = -14$

16. $y = -3x + 7$

$4x - 3y = 18$

$3x + 6y = 6$

$y = -3x - 7$

17. Your school is selling boxes of fruit. Customers can buy small and large boxes of oranges. You sold 3 small and 14 large boxes for a total of \$203. Your friend sold 11 small and 11 large boxes for a total of \$220. Find the cost of one small box and the cost of one large box.

Simplify the expression. Write your answer using only positive exponents.

18. $\frac{25x^{-3}y^{-2}z^{-1}}{100x^6y^{-1}z^0}$

19. $\frac{7m^0}{m^{-3}}$

20. $\frac{x^{-6}y^{-3}z^{-7}}{x^{-5}y^{-4}z^{-8}}$

Solve the equation. Check your solution.

21. $2^{x+7} = 2^8$

22. $4^{7x-14} = 4^{49}$

23. $2^{x-8} = 8^{x+4}$

**Chapter
9****Cumulative Review** (continued)

Find the sum or the difference.

24. $(-7g - 2) + (3g + 15)$

25. $(y - 5) - (-2y - 3)$

Find the product.

26. $(x - 3)(x + 8)$

27. $(-7x - 3y)^2$

Solve the equation.

28. $(3x - 18)(8x + 32) = 0$

29. $25g - 5g^2 = 0$

Factor the polynomial.

30. $m^2 - 6m + 8$

31. $z^2 - 2z - 35$

32. $2w^2 + 6w + 4$

33. An egg is thrown from the top of a tall building. The distance d (in feet) between the egg and the ground t seconds after it is thrown is given by $d = -16t^2 - 80t + 121$. How long after the egg is thrown is it 25 feet from the ground?

Solve the equation.

34. $z^2 - 25 = 0$

35. $y^2 + 22y + 121 = 0$

Factor the polynomial completely.

36. $3x^3 - 15x^2 - 4x + 20$

37. $4y^3 - 4y^2 - 7y + 7$

Graph the function. Compare the graph to the graph of $f(x) = x^2$.

38. $h(x) = 5x^2$

39. $t(x) = 0.375x^2$

40. $n(x) = -\frac{3}{7}x^2$

41. $g(x) = x^2 + 6$

42. $p(x) = 3x^2 + 7$

43. $q(x) = -\frac{1}{8}x^2 - 3$

44. The function $f(t) = -16t^2 + s_0$ represents the approximate height (in feet) of an object falling t seconds after it is dropped from an initial height s_0 (in feet). A truck is dropped from a height of 10,000 feet.
- After how many seconds does the truck hit the ground?
 - Suppose the initial height is adjusted by k feet. How will this affect part (a)?

Find (a) the axis of symmetry and (b) the vertex of the graph of the function.

45. $y = -5x^2 - 30x - 15$

46. $f(x) = 3x^2 - 30x - 5$

Chapter 9

Cumulative Review (continued)

Graph the function. Describe the domain and range.

47. $f(x) = 3x^2 - 6x + 2$

48. $f(x) = -4x^2 + 16x - 1$

Tell whether the function has a minimum value or a maximum value. Then find the value.

49. $f(x) = -x^2 - 2x + 3$

50. $f(x) = 10x^2 + 60x - 1$

Find the vertex and the axis of symmetry of the graph of the function.

51. $f(x) = \frac{2}{5}(x - 3)^2$

52. $g(x) = 7(x + 5)^2$

53. $g(x) = 3(x - 5)^2 + 4$

Graph the function. Compare the graph to the graph of $f(x) = x^2$.

54. $g(x) = 7(x + 6)^2$

55. $g(x) = \frac{4}{7}(x - 2)^2 - 8$

Graph the quadratic function.

56. $f(x) = 3(x - 2)(x + 6)$

57. $h(x) = x^2 - 3x - 10$

58. Tell whether the data represents a *linear*, an *exponential*, or a *quadratic* function. Then write the function.

$$(-2, -16), (-1, -15), (0, -12), (1, -7), (2, 0)$$

Simplify the expression.

59. $\sqrt{80y^3}$

60. $\sqrt{\frac{6}{27}}$

61. $-3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$

62. $\sqrt[3]{\frac{64x^5}{250y^9}}$

63. $\sqrt{3}(-5\sqrt{10} + \sqrt{6})$

64. $\frac{2}{2 + \sqrt{4}}$

Solve the equation by graphing.

65. $x^2 + 5x - 36 = 0$

66. $1 = x^2$

67. $x^2 + 4x = 5$

68. $7x - 12 = x^2$

Solve the equation using square roots.

69. $2x^2 = 32$

70. $2x^2 - 40 = 10$

71. $-2x^2 + 2 = 10$

72. A person in a hot air balloon drops a sandwich over the edge from a height of 64 feet. The function $h = -16t^2 + 64$ represents the height h (in feet) of the sandwich after t seconds. How long does it take the sandwich to hit the ground?

**Chapter
9****Cumulative Review** (continued)

Solve the equation by completing the square. ~~Round your solutions to the nearest hundredth, if necessary.~~ Keep solutions in radicals.

73. $x^2 + 3x + 2 = 0$

74. $y^2 + 12y + 20 = 0$

75. $w^2 + 16w - 22 = 0$

76. $t^2 + 10t + 14 = -7$

77. $7n^2 - 14n - 50 = 6$

78. $3h^2 + 20h + 36 = 4$

79. You want to enclose a rectangular vegetable garden with 60 feet of fence. How should you lay out the fence to maximize area?

Solve the equation using the Quadratic Formula. ~~Round your solutions to the nearest tenth, if necessary.~~ Keep solutions in radicals.

80. $4x^2 + 8x + 7 = 4$

81. $2y^2 + 3y - 20 = 0$

82. $2w^2 - 7w - 13 = -10$

83. $7z^2 + 4z - 10 = 6$

Find the number of x-intercepts of the graph of the function.

84. $y = x^2 - 2x + 10$

85. $y = x^2 + 4x + 4$

86. $y = x^2 - 10x - 2$

87. $y = 2x^2 - 3x + 4$

Solve the system of equations by graphing, elimination, or substitution, if possible.

88. $y = -x^2 + 6$
 $y = -2x - 2$

89. $y = 2x^2 + 3x - 6$
 $y = -x^2$

90. $y = 2x^2 - 16x + 35$
 $y = -x^2 + 2x - 2$

91. A rectangle has an area of 36 square inches and a perimeter of 30 inches. Find the dimensions of the rectangle.