

**Chapter
6****Cumulative Review** (continued)

Determine whether the sequence is arithmetic. If so, find the common difference.

22. $1, -4, 7, -10, \dots$

23. $-2, -7, -12, -17, \dots$

24. $2, 4, 8, 16, \dots$

Graph the function. Describe the domain and range.

25.
$$y = \begin{cases} 2x + 1, & \text{if } x < -1 \\ 0, & \text{if } x \geq -1 \end{cases}$$

26.
$$y = \begin{cases} x, & \text{if } x < 3 \\ \frac{2}{3}x - 4, & \text{if } x > 3 \end{cases}$$

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

27.
$$\begin{aligned} y &= -\frac{1}{2}x - 2 \\ y &= -\frac{3}{2}x + 2 \end{aligned}$$

28.
$$\begin{aligned} 8x + 14y &= 4 \\ -6x - 7y &= -10 \end{aligned}$$

29.
$$\begin{aligned} y &= 5x - 7 \\ -3x - 2y &= -12 \end{aligned}$$

30. The sum of the digits of a two-digit number is 7. Reversing its digits increases the number by 9. What is the number?

Solve the equation by graphing. Check your solution(s).

31. $9x - 4 = 2 - 3x$

32. $|4 - x| = |-6 + x|$

Graph the inequality.

33. $y < \frac{1}{5}x + 2$

34. $y \geq -x + 3$

35. $2x - 2y \leq -2$

36. You have \$500 in a savings account at the beginning of the summer. You want to have at least \$200 by the end of the summer. You withdraw \$25 each week.

- Write an inequality that represents this situation.
- For how many weeks can you withdraw money?

Graph the system of linear inequalities.

37. $x \leq -3$

$y < \frac{5}{3}x + 2$

38. $y \leq \frac{1}{2}x + 2$

$y < -2x - 3$

39. $4x + y < 2$

$y > -2$

Chapter 6

Cumulative Review (continued)

Evaluate the expression.

40. 2^0

41. $(-3)^0$

42. 3^{-4}

43. $\frac{(-3)^2}{-8^0}$

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

44. w^{-3}

45. h^0

46. $12x^{-5}y^0$

47. $\frac{2^{-4}x^2}{z^0}$

48. $\frac{r^{-7}}{10^{-2}z^{-5}}$

49. $\frac{17x^{-1}y^{-10}}{7^{-2}z^0}$

Rewrite the expression in rational exponent form.

50. $\sqrt{8}$

51. $\sqrt[3]{18}$

52. $\sqrt[3]{3}$

Rewrite the expression in radical form.

53. $24^{1/4}$

54. $37^{1/10}$

55. $140^{1/2}$

Evaluate the expression.

56. $\sqrt[3]{729}$

57. $\sqrt[4]{625}$

58. $\sqrt[5]{-32}$

59. $512^{2/3}$

60. $(-256)^{5/8}$

61. $1024^{6/5}$

Use the formula $r = \left(\frac{F}{P}\right)^{1/n} - 1$ to find the annual inflation rate to the nearest tenth of a percent.

62. A house increases in value from \$30,000 to \$120,000 over a period of 40 years.

63. The cost of a quart of strawberries increases from \$0.99 to \$3.49 over a period of 25 years.

Determine whether the table represents a *linear* or an *exponential* function.

64.

x	1	2	3	4
y	1	3	9	27

65.

x	-4	0	4	8
y	9	2	-5	-12

**Chapter
6****Cumulative Review (continued)**

Evaluate the function for the given value of x .

66. $y = 4^x; x = -1$

67. $y = -3(7)^x; x = 4$

68. $f(x) = \frac{1}{4}(2)^x; x = -3$

Identify the initial amount a and the rate of growth r (as a percent) of the exponential function. Evaluate the function when $t = 4$. Round your answer to the nearest tenth.

69. $y = 250(1 + 0.05)^t$

70. $y = 5(1 + 0.2)^t$

71. $f(t) = 1000(1.002)^t$

72. $p(t) = 3^t$

Write a function that represents the situation.

73. A \$20,000 car decreases in value by 15% every year.

74. A newborn baby weighs 8 pounds and increases its weight by 5% every week.

75. A company profit of \$1,000,000 decreases by 50% every day.

Solve the equation. Check your solution.

76. $3^{6x} = 3^{18}$

77. $5^{2x+11} = 5^{-7}$

78. $(25)^{3x+6} = (125)^{4x}$

Determine whether the sequence is *arithmetic*, *geometric*, or *neither*.

79. 180, 90, 45, ...

80. 1, 4, 16, 64, ...

81. 17, 23, 29, 35, ...

Write the next three terms of the geometric sequence.

82. 486, 162, 54, ...

83. 6, 12, 24, 48, ...

84. 36, 18, 9, $\frac{9}{2}$, ...

Write the first six terms of the sequence.

85. $a_1 = 1, a_n = a_{n-1} + 3$

86. $a_1 = 3, a_n = 2a_{n-1}$

87. Write a recursive rule for the number of bacteria at time t , if after 1 minute, there is 1 bacterium. After 2 minutes, there are 3 bacteria. After 3 minutes, there are 9 bacteria. After 4 minutes, there are 27 bacteria.