Cumulative Practice

Plot the numbers on a number line. Write the numbers in increasing order. (1.1)

1. $0, \pi, 2\frac{3}{4}, -\frac{3}{2}, 4$

2. $\frac{5}{2}, -\frac{1}{10}, -2, \sqrt{5}, 1.9$

3. $-4.25, -\frac{16}{3}, -\sqrt{9}, -0.4, -1$

Identify the property shown. (1.1)

4. $8 \cdot \frac{1}{8} = 1$

5. $-1(9 + 7) = (-1)9 + (-1)7$

6. $-6 \cdot (-3 \cdot 4) = (-6 \cdot (-3)) \cdot 4$

Evaluate the expression. (1.2)

7. $12 \div 2 - 4 \cdot 7$

8. $-8 + 3(1 - 5)^2$

9. $17 - 2^4 \div 8 + 1$

10. $-2(16 + 7) \div -10$

Simplify the expression. (1.2)

11. $18a + 7a - 9a + 11$

12. $10x - (4y - x) + y$

13. $6(n^2 - n) - 5n^2 + 8n$

Solve the equation. (1.3, 1.7)

14. $\frac{5}{8}x - 9 = 21$

15. $-75 = 9x - 3$

16. $4(2x - 1) = -20$

17. $3 - x = 5x + 27$

18. $\left| x \right| = 9$

19. $\left| 4x + 1 \right| = 39$

20. $\left| 7 - 2x \right| = 15$

21. $\left| x - 10 \right| = 0$

Solve the formula for the indicated variable. (1.4)

22. Distance
Solve for r: $d = rt$

23. Volume of a Cylinder
Solve for h: $V = \pi r^2 h$

24. Area of a Trapezoid
Solve for h: $A = \frac{1}{2}(b_1 + b_2)h$

Solve the inequality. Then graph the solution. (1.6, 1.7)

25. $14 - 5x > -6$

26. $1 \le x - 13 \le 20$

27. $3x - 2 \le 0$ or $x + 6 > 8$

28. $\left| x - 7 \right| \le 1$

29. $\left| 7x - 9 \right| \ge 12$

30. $\left| \frac{1}{4}x + 3 \right| > 5$

31. $\left| -5x \right| < 10$

Graph the relation. Then tell whether the relation is a function. (2.1)

32.

x	2	−4	2	−1	0
y	1	0	5	−1	3

33.

x	−3	−1	1	3	5
y	1	0	−1	−2	−3

Graph in a coordinate plane. (2.1, 2.3, 2.6–2.8)

34. $y = -2x + 5$

35. $x - 3y = 6$

36. $y = 2$

37. $x = -4$

38. $y > \frac{2}{5}x - 2$

39. $y \le -1$

40. $4x + 3y \le 24$

41. $y > -x$

42. $f(x) = 4\left| x \right|$

43. $f(x) = \left| x \right| - 3$

44. $f(x) = 2\left| x + 2 \right|$

45. $f(x) = -\left| x - 5 \right| + 1$

46. $f(x) = \begin{cases} 2x, & \text{if } x \le 0 \\ -2x, & \text{if } x > 0 \end{cases}$

47. $f(x) = \begin{cases} \frac{1}{2}x + 1, & \text{if } x \le -2 \\ x + 1, & \text{if } x > -2 \end{cases}$

48. $f(x) = \begin{cases} 4, & \text{if } -5 \le x < 0 \\ -4, & \text{if } 0 \le x \le 5 \end{cases}$

Graph the system. Describe the solution(s). (3.1, 3.3)

49. $4x - 2y = 8$
$4x + y = 2$

50. $y = x$
$y = x - 3$
$y = x + 5$

51. $2x - y > 1$
$x < 3$

52. $x \ge 0$
$y \ge 0$
$x + y \le 8$

Tell whether the lines are *perpendicular, parallel,* or *neither*. (2.2)

53. Line 1: through $(0, 7)$ and $(3, 6)$
Line 2: through $(-2, -9)$ and $(0, -3)$

54. Line 1: through $(-6, -3)$ and $(0, 1)$
Line 2: through $(0, -5)$ and $(4, -2)$

Write an equation of the line with the given characteristics. (2.4)

55. slope: -3, *y*-intercept: 7

56. vertical line through $(2, 5)$

57. *x*-intercept: -2, *y*-intercept: 1

Evaluate the function for the given value(s). (2.1, 2.7, 2.8, 3.5)

58. $f(x) = 5x - 17, f(-3)$

59. $f(x) = x^2 - 2x + 11, f(2)$

60. $f(x) = \begin{cases} x - 4, & \text{if } x \le 0 \\ x + 2, & \text{if } x > 0, \end{cases} f(-2)$

61. $f(x) = -|12 - 8x|, f(1)$

62. $f(x, y) = 8x - 5y, f(3, -2)$

63. $f(x, y) = 2(-x + y), f(-1, 0)$

Solve the system using any algebraic method. (3.2, 3.6)

64. $-x + 5y = 8$
$-3x + 15y = 24$

65. $x - 3y = 7$
$2x + y = 7$

66. $x + y - z = 7$
$-x + 2y + 2z = 3$
$3x - y - z = 1$

67. $2x + y + z = 4$
$x - y - 2z = -9$
$2x - y + z = 6$

Graph in a three-dimensional coordinate system. (3.5)

68. $(1, -4, 2)$

69. $(-2, 3, -5)$

70. $x + 2y + 3z = 6$

71. $10x + 4y + 5z = 20$

72. 🌎 **SWEATER SALE** You pay $38.50 for a sweater that is marked 30% off the regular price. What is the regular price of the sweater? How much did you save by buying it on sale? **(1.5)**

73. 🌎 **BODY TEMPERATURE** Although the average body temperature of a healthy baby is 98.6°F, the temperature can vary from 97°F to 100°F. Write an inequality to describe the range of healthy temperatures. On a number line, graph the inequality and mark the average body temperature of a healthy baby. **(1.6)**

74. 🌎 **HIGHWAY TRAVEL** If you drive at a constant speed then the distance you travel d varies directly with the time t. Suppose you use cruise control and drive 180 miles in 3 hours. Write an equation to show the relationship between d and t. What is the constant of variation and what does it represent? **(2.4)**

75. 🌎 **SOLID WASTE** The table gives the amount of material recovered from solid waste (in millions of tons) in the United States from 1988 to 1996. Make a scatter plot of the data and approximate a best-fitting line. Predict the amount of material recovered in the United States in 2002. **(2.5)**

Years since 1988, *t*	0	1	2	3	4	5	6	7	8
Material, *m*	23.5	29.9	33.6	37.0	40.6	43.8	50.9	55.1	57.3

▶ Source: *Statistical Abstract of the United States*

76. 🌎 **AUTO RENTAL** An automobile rental agency charges $60 per day with unlimited mileage. A second agency charges $45 per day plus $.25 per mile after the first 100 miles. For a one-day rental, after how many miles will the first agency be less expensive? **(3.1, 3.2)**

77. 🌎 **STIR-FRY RECIPE** A restaurant serves a stir-fry dish containing vegetables and beef. The recipe calls for no more than twice as many pounds of vegetables as beef. The owner buys vegetables at $1.39 per pound and beef at $1.79 per pound and will order a total of 150 pounds. To minimize the cost yet satisfy the recipe, how much of each food should the owner order? What will be the total cost? **(3.4)**