CHAPTER 6

Cumulative Practice

for Chapters 1–6

Solve the equation. (1.3, 1.7)

1. $5x + 4 = -21$ **2.** $3(2x + 5) = 69$ **3.** $|x - 2| = 6$ **4.** $|7 - 3x| = 23$

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

5. $10 - 4x > -2$ **6.** $0 \leq 2x - 8 \leq 14$ **7.** $|x - 3| < 5$ **8.** $|5x + 2| \geq 17$

Find the slope of the line passing through the given points. (2.2)

9. $(4, 1), (-2, 1)$ **10.** $(-3, 0), (0, 2)$ **11.** $(-1, -5), (2, 7)$ **12.** $(-4, 4), (1, -3)$

Graph the equation or inequality. (2.3, 2.6–2.8)

13. $y = -2x - 1$ **14.** $3x - 7y = 21$ **15.** $x = -4$

16. $y > \frac{3}{2}x + 2$ **17.** $2x + 6y \leq 12$ **18.** $y = |x| + 3$

19. $y = -2|x + 4| - 1$ **20.** $f(x) = \begin{cases} -2, & \text{if } x \leq 0 \\ 3, & \text{if } x > 0 \end{cases}$ **21.** $f(x) = \begin{cases} -x, & \text{if } x < 1 \\ x - 2, & \text{if } x \geq 1 \end{cases}$

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

22. slope: 3, y-intercept: -2 **23.** points on line: $(-1, 9), (1, 1)$ **24.** vertical line through $(-8, 6)$

Solve the system of linear equations using any method. (3.1, 3.2, 3.6, 4.3, 4.5)

25. $\begin{aligned} x + y &= 8 \\ 2x - y &= 1 \end{aligned}$ **26.** $\begin{aligned} 3x - 4y &= 5 \\ 2x + 2y &= 1 \end{aligned}$ **27.** $\begin{aligned} x + y + z &= 4 \\ x - 4y + 3z &= 10 \\ -4x + y + z &= -1 \end{aligned}$ **28.** $\begin{aligned} x - y + z &= 1 \\ -x + y + 2z &= 2 \\ x + y + z &= -3 \end{aligned}$

Graph the ordered triple or equation in a three-dimensional coordinate system. (3.5)

29. $(-1, -3, 0)$ **30.** $(2, 4, -2)$ **31.** $4x + 2y + z = 4$ **32.** $5x + 5y + 2z = 10$

Perform the indicated operation. (4.1, 4.2)

33. $\begin{bmatrix} -3 & 7 \\ 4 & -2 \end{bmatrix} + \begin{bmatrix} -8 & 1 \\ -3 & 0 \end{bmatrix}$ **34.** $-6\begin{bmatrix} 2 & 3 \\ -4 & -2 \\ -5 & -1 \end{bmatrix}$ **35.** $\begin{bmatrix} 1 & -5 \\ 6 & 3 \end{bmatrix}\begin{bmatrix} 2 & -2 & 8 \\ -3 & 1 & 7 \end{bmatrix}$

Evaluate the determinant of the matrix. (4.3)

36. $\begin{bmatrix} -5 & 2 \\ 4 & -2 \end{bmatrix}$ **37.** $\begin{bmatrix} 0 & 1 \\ -3 & 6 \end{bmatrix}$ **38.** $\begin{bmatrix} 3 & 9 & 1 \\ -5 & 1 & 2 \\ -2 & 4 & 8 \end{bmatrix}$ **39.** $\begin{bmatrix} -1 & 0 & 1 \\ 3 & 7 & -2 \\ 8 & 1 & 0 \end{bmatrix}$

Find the inverse of the matrix. (4.4)

40. $\begin{bmatrix} -5 & 2 \\ -7 & 3 \end{bmatrix}$ **41.** $\begin{bmatrix} -1 & -2 \\ 4 & 7 \end{bmatrix}$ **42.** $\begin{bmatrix} 4 & 9 \\ 2 & 4 \end{bmatrix}$ **43.** $\begin{bmatrix} 4 & -2 \\ -2 & 1 \end{bmatrix}$

Graph the equation or inequality. (5.1, 5.7, 6.2, 6.8)

44. $y = x^2 + 8x + 16$ **45.** $y = -(x - 1)^2 + 3$ **46.** $y = 2(x + 1)(x - 3)$

47. $y \leq \frac{1}{4}x^2 - 3$ **48.** $y < -2x^2 + 4x + 5$ **49.** $y = x^3 - 4x^2 + x + 7$

50. $y = -3x^4 + 9x^2 - 2$ **51.** $y = -(x + 2)(x - 1)(x - 2)$ **52.** $y = 2x^2(x - 3)^2$

Solve the equation or inequality. (5.2–5.7, 6.4)

53. $3x^2 - 7 = 2(x^2 + 3)$ **54.** $4x^2 + 12x + 9 = 0$ **55.** $x^2 + 64 = 0$

56. $x^2 + 4x = 4$ **57.** $100 - x^2 \geq 0$ **58.** $x^2 - 6 > -5x$

59. $x^4 - 5x^2 + 4 = 0$ **60.** $3x^4 - 15x^3 = 0$ **61.** $2x^3 + 4x^2 - 3x - 6 = 0$

Write the expression as a complex number in standard form. (5.4)

62. $\frac{7 + 3i}{4 - i}$ **63.** $4i(5 - 8i)$ **64.** $(9 + 5i)(9 - 5i)$ **65.** $(6 - 2i) - (-3 - 4i)$

Write a quadratic function in the specified form whose graph has the given characteristics. (5.8)

66. vertex form
vertex: (5, 3)
point on graph: (7, 11)

67. intercept form
x-intercepts: -3, -2
point on graph: (0, -6)

68. standard form
points on graph:
(1, 4), (3, -4), (6, -61)

Simplify the expression. (6.1)

69. $(6xy^3)^2$ **70.** $7x^{-10}y^4$ **71.** $\left(\frac{5}{4}\right)^{-2}$ **72.** $\frac{3x^2y^{-1}}{2x} \cdot \frac{10x^2y}{3y^{-3}}$

Perform the indicated operation. (6.3, 6.5)

73. $(x - 3)(x^3 - 2x^2 + 5x - 12)$ **74.** $(7x^3 - 9x + 2) + (5x^3 + 9x)$ **75.** $(x^4 - 3x^3 + 8x^2 - 2) \div (x + 2)$

Find all the zeros of the function. (6.6, 6.7)

76. $f(x) = 2x^3 - 5x^2 - 4x + 3$ **77.** $f(x) = x^4 - 25$ **78.** $f(x) = x^3 + 11x^2 + x + 11$

Write a cubic function whose graph passes through the given points. (6.9)

79. $(-4, 0)$, $(-1, 0)$, $(1, 0)$, $(-2, 6)$ **80.** $(-6, 0)$, $(0, 0)$, $(3, 0)$, $(6, -144)$

81. **SIMPLE INTEREST** The formula for simple interest is $I = Prt$. Solve the formula for r. Then find the annual interest rate if a \$1000 deposit earns \$165 of simple interest in 3 years. (1.4)

82. **COST OF BREAD** The table gives the number of one-pound loaves of bread you could buy for \$1.00 in the United States for various years since 1900. Make a scatter plot of the data and describe the correlation shown. (2.5)

Years since 1900, t	13	30	50	70	90	97
Loaves of bread, b	17.8	11.6	6.9	4.1	1.4	1.1

INTERNET **DATA UPDATE** of Bureau of Labor Statistics data at www.mcdougallittell.com

83. **PHONE RATES** A long distance carrier charges a flat rate of \$.09 per minute for telephone calls. A second carrier charges \$.30 for the first minute and \$.06 for each additional minute. After how many minutes will the second carrier be less expensive than the first carrier? (3.2)

84. **CRYPTOGRAMS** Use the matrix $A = \begin{bmatrix} -2 & 5 \\ 1 & 8 \end{bmatrix}$ and the coding information on page 225 to encode the message EXIT NOW. (4.4)

85. **SCIENCE CONNECTION** Pluto is about 3,660,000,000 mi from the sun. Light travels through space at a speed of about 671,000,000 mi/h. Use scientific notation to find how long it takes light from the sun to reach Pluto. (6.1)