Review Exercises

For Exercises 3–6, clear parentheses and combine *like* terms.

3. $8x - 3y + 2xy - 5x + 12xy$

4. $5ab + 5a - 13 - 2a + 17$

5. $2(3z - 4) - (z + 12)$

6. $-(6w - 5) + 3(4w - 5)$

Concept 1: Definition of a Linear Equation in One Variable

For Exercises 7–12, label the equation as linear or nonlinear.

7. $2x + 1 = 5$

8. $10 = x + 6$

9. $x^2 + 7 = 9$

10. $3 + x^3 - x = 4$

11. $-3 = x$

12. $5.2 - 7x = 0$

13. Use substitution to determine which value is the solution to $2x - 1 = 5$.

    a. 2   **b.** 3   **c.** 0   **d.** -1

14. Use substitution to determine which value is the solution to $2y - 3 = -2$.

    a. 1   **b.** $\dfrac{1}{2}$ **c.** 0   **d.** $-\dfrac{1}{2}$

Concept 2: Solving Linear Equations

For Exercises 15–44, solve the equation and check the solution. (See Examples 1–6.)

15. $x + 7 = 19$

16. $-3 + y = -28$

17. $-x = 2$

18. $-t = \dfrac{3}{4}$

19. $-\dfrac{7}{8} = -\dfrac{5}{6}z$

20. $-\dfrac{12}{13} = \dfrac{4}{3}b$

21. $\dfrac{a}{5} = -8$

22. $\dfrac{x}{8} = \dfrac{1}{2}$

23. $2.53 = -2.3t$

24. $-4.8 = 6.1 + y$

25. $p - 2.9 = 3.8$

26. $-4.2a = 4.494$

27. $6q - 4 = 62$

28. $2w - 15 = 15$

29. $4y - 17 = 35$

30. $6z - 25 = 83$

31. $-b - 5 = 2$

32. $6 = -y + 1$

33. $3(x - 6) = 2x - 5$

34. $13y + 4 = 5(y - 4)$

35. $6 - (t + 2) = 5(3t - 4)$

36. $1 - 5(p + 2) = 2(p + 13)$

37. $6(a + 3) - 10 = -2(a - 4)$

38. $8(b - 2) + 3b = -9(b - 1)$

39. $-2[5 - (2z + 1)] - 4 = 2(3 - z)$

40. $3[w - (10 - w)] = 7(w + 1)$

41. $6(-y + 4) - 3(2y - 3) = -y + 5 + 5y$

42. $13 + 4w = -5(-w - 6) + 2(w + 1)$

43. $14 - 2x + 5x = -4(-2x - 5) - 6$

44. $8 - (p + 2) + 6p + 7 = p + 13$

Concept 3: Clearing Fractions and Decimals

For Exercises 45–56, solve the equations. **(See Examples 7–9.)**

● **45.** $\frac{2}{3}x - \frac{1}{6} = -\frac{5}{12}x + \frac{3}{2} - \frac{1}{6}x$

46. $-\frac{1}{2}y + 4 = -\frac{9}{10}y + \frac{2}{5}$

47. $\frac{1}{5}(p - 5) = \frac{3}{5}p + \frac{1}{10}p + 1$

48. $\frac{5}{6}(q + 2) = -\frac{7}{9}q - \frac{1}{3} + 2$

49. $\frac{3x - 7}{2} + \frac{3 - 5x}{3} = \frac{3 - 6x}{5}$

50. $\frac{2y - 4}{5} = \frac{5y + 13}{4} + \frac{y}{2}$

51. $\frac{4}{3}(2q + 6) - \frac{5q - 6}{6} - \frac{q}{3} = 0$

52. $\frac{-3a + 9}{15} - \frac{2a - 5}{5} - \frac{a + 2}{10} = 0$

53. $6.3w - 1.5 = 4.8$

54. $0.2x + 53.6 = x$

55. $0.75(m - 2) + 0.25m = 0.5$

56. $0.4(n + 10) + 0.6n = 2$

Concept 4: Conditional Equations, Contradictions, and Identities

57. What is a conditional equation?

58. Explain the difference between a contradiction and an identity.

For Exercises 59–64, identify the equation as a conditional equation, a contradiction, or an identity. Then give the solution set. **(See Example 10.)**

59. $4x + 1 = 2(2x + 1) - 1$

60. $3x + 6 = 3x$

61. $-11x + 4(x - 3) = -2x - 12$

62. $5(x + 2) - 7 = 3$

63. $2x - 4 + 8x = 7x - 8 + 3x$

64. $-7x + 8 + 4x = -3(x - 3) - 1$

Mixed Exercises

For Exercises 65–96, solve the equations.

65. $-5b + 9 = -71$

66. $-3x + 18 = -66$

67. $16 = -10 + 13x$

68. $15 = -12 + 9x$

69. $10c + 3 = -3 + 12c$

70. $2w + 21 = 6w - 7$

71. $12b - 15b - 8 + 6 = 4b + 6 - 1$

72. $4z + 2 - 3z + 5 = 3 + z + 4$

73. $5(x - 2) - 2x = 3x + 7$

74. $2x + 3(x - 5) = 15$

75. $\frac{c}{2} - \frac{c}{4} + \frac{3c}{8} = 1$

76. $\frac{d}{5} - \frac{d}{10} + \frac{5d}{20} = \frac{7}{10}$

77. $0.75(8x - 4) = \frac{2}{3}(6x - 9)$

78. $-\frac{1}{2}(4z - 3) = -z$

● **79.** $7(p + 2) - 4p = 3p + 14$

80. $6(z - 2) = 3z - 8 + 3z$

81. $4[3 + 5(3 - b) + 2b] = 6 - 2b$

82. $\frac{1}{3}(x + 3) - \frac{1}{6} = \frac{1}{6}(2x + 5)$

83. $3 - \frac{3}{4}x = 9$

84. $\frac{9}{10} - 4w = \frac{5}{2}$

85. $\frac{5}{4} + \frac{y - 3}{8} = \frac{2y + 1}{2}$

86. $\frac{2}{3} - \frac{x + 2}{6} = \frac{5x - 2}{2}$

87. $\frac{2y - 9}{10} + \frac{3}{2} = y$

88. $\frac{2}{3}x - \frac{5}{6}x - 3 = \frac{1}{2}x - 5$

89. $0.48x - 0.08x = 0.12(260 - x)$

90. $0.07w + 0.06(140 - w) = 90$

91. $0.5x + 0.25 = \frac{1}{3}x + \frac{5}{4}$