Exercise Set P.1

Practice Exercises

In Exercises 1–16, evaluate each algebraic expression for the given value or values of the variable(s).

1. $7 + 5x$, for $x = 10$

2. $8 + 6x$, for $x = 5$

3. $6x - y$, for $x = 3$ and $y = 8$

4. $8x - y$, for $x = 3$ and $y = 4$

5. $x^2 + 3x$, for $x = 8$

6. $x^2 + 5x$, for $x = 6$

7. $x^2 - 6x + 3$, for $x = 7$

8. $x^2 - 7x + 4$, for $x = 8$

9. $4 + 5(x - 7)^3$, for $x = 9$

10. $6 + 5(x - 6)^3$, for $x = 8$

11. $x^2 - 3(x - y)$, for $x = 8$ and $y = 2$

12. $x^2 - 4(x - y)$, for $x = 8$ and $y = 3$

13. $\dfrac{5(x+2)}{2x-14}$, for $x = 10$

14. $\dfrac{7(x-3)}{2x-16}$, for $x = 9$

15. $\dfrac{2x+3y}{x+1}$, for $x = -2$ and $y = 4$

16. $\dfrac{2x+y}{xy-2x}$, for $x = -2$ and $y = 4$

In Exercises 21–28, find the intersection of the sets.

21. $\{1,2,3,4\} \cap \{2,4,5\}$

22. $\{1,3,7\} \cap \{2,3,8\}$

23. $\{s,e,t\} \cap \{t,e,s\}$

24. $\{r,e,a,l\} \cap \{l,e,a,r\}$

25. $\{1,3,5,7\} \cap \{2,4,6,8,10\}$

26. $\{0,1,3,5\} \cap \{-5,-3,-1\}$

27. $\{a,b,c,d\} \cap \varnothing$

28. $\{w,y,z\} \cap \varnothing$

In Exercises 29–34, find the union of the sets.

29. $\{1,2,3,4\} \cup \{2,4,5\}$

30. $\{1,3,7,8\} \cup \{2,3,8\}$

31. $\{1,3,5,7\} \cup \{2,4,6,8,10\}$

32. $\{0,1,3,5\} \cup \{2,4,6\}$

33. $\{a,e,i,o,u\} \cup \varnothing$

34. $\{e,m,p,t,y\} \cup \varnothing$

In Exercises 35–38, list all numbers from the given set that are **a.** *natural numbers,* **b.** *whole numbers,* **c.** *integers,* **d.** *rational numbers,* **e.** *irrational numbers,* **f.** *real numbers.*

35. $\left\{-9, -\frac{4}{5}, 0, 0.25, \sqrt{3}, 9.2, \sqrt{100}\right\}$

36. $\left\{-7, -0.\overline{6}, 0, \sqrt{49}, \sqrt{50}\right\}$

37. $\left\{-11, -\frac{5}{6}, 0, 0.75, \sqrt{5}, \pi, \sqrt{64}\right\}$

38. $\left\{-5, -0.\overline{3}, 0, \sqrt{2}, \sqrt{4}\right\}$

39. Give an example of a whole number that is not a natural number.

40. Give an example of a rational number that is not an integer.

41. Give an example of a number that is an integer, a whole number, and a natural number.

42. Give an example of a number that is a rational number, an integer, and a real number.

Determine whether each statement in Exercises 43–50 is true or false.

43. $-13 \le -2$

44. $-6 > 2$

45. $4 \ge -7$

46. $-13 < -5$

47. $-\pi \ge -\pi$

48. $-3 > -13$

49. $0 \ge -6$

50. $0 \ge -13$

In Exercises 51–60, rewrite each expression without absolute value bars.

51. $|300|$

52. $|-203|$

53. $|12 - \pi|$

54. $|7 - \pi|$

55. $|\sqrt{2} - 5|$

56. $|\sqrt{5} - 13|$

57. $\dfrac{-3}{\quad}$

58. $\dfrac{-7}{\quad}$

In Exercises 75–84, state the name of the property illustrated.

75. $6 + (-4) = (-4) + 6$

76. $11 \cdot (7 + 4) = 11 \cdot 7 + 11 \cdot 4$

77. $6 + (2 + 7) = (6 + 2) + 7$

78. $6 \cdot (2 \cdot 3) = 6 \cdot (3 \cdot 2)$

79. $(2 + 3) + (4 + 5) = (4 + 5) + (2 + 3)$

80. $7 \cdot (11 \cdot 8) = (11 \cdot 8) \cdot 7$

81. $2(-8 + 6) = -16 + 12$

82. $-8(3 + 11) = -24 + (-88)$

83. $\dfrac{1}{(x+3)}(x + 3) = 1, x \ne -3$

84. $(x + 4) + [-(x + 4)] = 0$

In Exercises 85–96, simplify each algebraic expression.

85. $5(3x + 4) - 4$

86. $2(5x + 4) - 3$

87. $5(3x - 2) + 12x$

88. $2(5x - 1) + 14x$

89. $7(3y - 5) + 2(4y + 3)$

90. $4(2y - 6) + 3(5y + 10)$

91. $5(3y - 2) - (7y + 2)$

92. $4(5y - 3) - (6y + 3)$

93. $7 - 4[3 - (4y - 5)]$

94. $6 - 5[8 - (2y - 4)]$

95. $18x^2 + 4 - [6(x^2 - 2) + 5]$

96. $14x^2 + 5 - [7(x^2 - 2) + 4]$

In Exercises 97–102, write each algebraic expression without parentheses.

97. $-(-14x)$

98. $-(-17y)$

99. $-(2x - 3y - 6)$

100. $-(5x - 13y - 1)$

101. $\frac{1}{3}(3x) + [(4y) + (-4y)]$

102. $\frac{1}{2}(2y) + [(-7x) + 7x]$