



Practice and Problem-Solving Exercises



Practice

Use the Distributive Property to simplify each expression.

9. $6(a + 10)$

10. $8(4 + x)$

11. $(5 + w)5$

12. $(2t + 3)11$

13. $10(9 - t)$

14. $12(2j - 6)$

15. $16(7b + 6)$

16. $(1 + 3d)9$

17. $(3 - 8c)1.5$

18. $(5w - 15)2.1$

19. $\frac{1}{4}(4f - 8)$

20. $6(\frac{1}{3}h + 1)$

21. $(-8z - 10)(-1.5)$

22. $0(3.7x - 4.21)$

23. $1(\frac{3}{11} - \frac{7d}{17})$

24. $\frac{1}{2}(\frac{1}{2}y - \frac{1}{2})$

See Problem 1.

Write each fraction as a sum or difference.

25. $\frac{2x + 7}{5}$

26. $\frac{17 + 5n}{4}$

27. $\frac{8 - 9x}{3}$

28. $\frac{4y - 12}{2}$

29. $\frac{25 - 8t}{5}$

30. $\frac{18x + 51}{17}$

31. $\frac{22 - 2n}{2}$

32. $\frac{42w + 14}{7}$

See Problem 2.

Simplify each expression.

33. $-(20 + d)$

34. $-(-5 - 4y)$

35. $-(9 - 7c)$

36. $-(-x + 15)$

37. $-(18a - 17b)$

38. $-(2.1c - 4d)$

39. $-(-m + n + 1)$

40. $-(-x + 3y - 3)$

Use mental math to find each product.

41. 5.1×8

42. 3×7.25

43. 299×3

44. 4×197

45. 3.9×6

46. 5×2.7

47. 6.15×4

48. 6×9.1

See Problem 4.

49. You buy 50 of your favorite songs from a Web site that charges \$.99 for each song. What is the cost of 50 songs? Use mental math.

50. The perimeter of a baseball diamond is about 360 ft. If you take 12 laps around the diamond, what is the total distance you run? Use mental math.

51. One hundred and five students see a play. Each ticket costs \$45. What is the total amount the students spend for tickets? Use mental math.

52. Suppose the distance you travel to school is 5 mi. What is the total distance for 197 trips from home to school? Use mental math.

Simplify each expression by combining like terms.

53. $11x + 9x$

54. $8y - 7y$

55. $5t - 7t$

56. $-n + 4n$

57. $5w^2 + 12w^2$

58. $2x^2 - 9x^2$

59. $-4y^2 + 9y^2$

60. $6c - 4 + 2c - 7$

61. $5 - 3x + y + 6$

62. $2n + 1 - 4m - n$

63. $-7h + 3h^2 - 4h - 3$

64. $10ab + 2ab^2 - 9ab$

See Problem 5.



Apply

Write a word phrase for each expression. Then simplify each expression.

65. $3(t - 1)$

66. $4(d + 7)$

67. $\frac{1}{3}(6x - 1)$

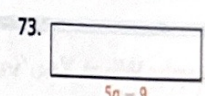
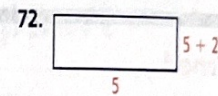
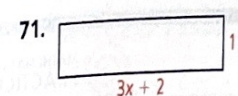
STEM 68. Physiology The recommended heart rate for exercise, in beats per minute, is given by the expression $0.8(200 - y)$ where y is a person's age in years. Rewrite this expression using the Distributive Property. What is the recommended heart rate for a 20-year-old person? For a 50-year-old person? Use mental math.

69. Error Analysis Identify and correct the error shown at the right.

70. Error Analysis A friend uses the Distributive Property to simplify $4(2b - 5)$ and gets $8b - 5$ as the result. Describe and correct the error.

$$\begin{aligned} 4(x+5) &= (4 \cdot x)(4 \cdot 5) \\ &= 80x \end{aligned}$$

Geometry Write an expression in simplified form for the area of each rectangle.



- 74. Think About a Plan** You are replacing your regular shower head with a water-saving shower head. These shower heads use the amount of water per minute shown. If you take an 8-min shower, how many gallons of water will you save?
- Which would you use to represent water saved each minute, an expression involving addition or an expression involving subtraction?
 - How can you use the Distributive Property to find the total amount of water saved?



Simplify each expression.

75. $6yz + 2yz - 8yz$

76. $-2ab + ab + 9ab - 3ab$

77. $-9m^3n + 4m^3n + 5mn$

78. $3(-4cd - 5)$

79. $12x^2y - 8x^2y^2 + 11x^2y - 4x^3y^2 - 9xy^2$

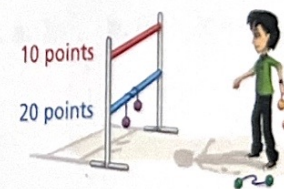
80. $a - \frac{a}{4} + \frac{3}{4}a$

81. Reasoning The Distributive Property also applies to division, as shown.

$$\frac{a + b}{c} = \frac{a}{c} + \frac{b}{c}$$

Use the Distributive Property of Division to rewrite $\frac{9 + 12n}{3}$. Then simplify.

82. Lawn Game You play a game where you throw a pair of connected balls at a structure, as shown at the right. When a pair wraps around a bar, you earn the points shown. You toss 3 pairs, and all of them wrap around a bar. Which expression could represent your total score if a pairs of balls wrap around the blue bar?



(A) $30 + 10a$

(C) $10a + 20(3 - a)$

(B) $20a + 3 - 10a$

(D) $30a + 10$