

EXERCISES

For more practice, see *Extra Practice*.

Practice and Problem Solving

A Practice by Example

Example 1 (page 82)

Solve each equation. Check your answer.

1. $1 + \frac{a}{5} = -1$ 2. $2n - 5 = 7$ 3. $-1 = 3 + 4x$ 4. $\frac{y}{2} + 5 = -12$
5. $3b + 7 = -2$ 6. $\frac{x}{3} - 9 = 0$ 7. $14 + \frac{h}{5} = 2$ 8. $-10 = -6 + 2c$
9. $\frac{m}{8} + 4 = 16$ 10. $\frac{a}{4} - 21 = 7$ 11. $3x - 1 = 8$ 12. $10 = 2n + 1$
13. $35 = 3 + 5x$ 14. $41 = \frac{2}{5}x - 7$ 15. $-3 + \frac{m}{3} = 12$ 16. $9 + \frac{n}{5} = 19$

Example 2 (page 82)

Define a variable and write an equation for each situation. Then solve.

17. **Donations** A library receives a large cash donation and uses the funds to double the number of books it owns. Then a book collector gives the library 4028 books. After this, the library has 51,514 books. How many books did the library have before the cash donation and the gift of books?
18. **Cooking** Suppose you are helping to prepare a large meal. You can peel 2 carrots per minute. You need 60 peeled carrots. How long will it take you to finish if you have already peeled 18 carrots?
19. **Cell Phones** One cell phone plan costs \$39.95 per month. The first 500 minutes of usage are free. Each minute thereafter costs \$.35. For a bill of \$69.70, how many minutes over 500 minutes was the cell phone in use?

Example 3 (page 83)

Solve each equation. Check your answer.

20. $-b + 5 = -16$ 21. $-p - 24 = -8$ 22. $-7 = -c - 29$ 23. $-y - 52 = 33$
24. $-m + 2 = 1$ 25. $-9 = -a + 16$ 26. $-x + 100 = 100$ 27. $-1 = -n - 3$
28. $-y - 3 = 8$ 29. $15 = -z + 8$ 30. $-q + 5 = 10$ 31. $-a + 9 = 25$
32. $-x - 4 = 20$ 33. $-y + 10 = 25$ 34. $5 = -z - 3$ 35. $9 = -x + 8$

Examples 4, 5 (page 83)

Justify each step.

36. $\frac{x}{5} + 9 = 11$
 $\frac{x}{5} + 9 - 9 = 11 - 9$
 $\frac{x}{5} = 2$
 $5\left(\frac{x}{5}\right) = 5(2)$
 $x = 10$

38. $18 - n = 21$
 $18 - n - 18 = 21 - 18$
 $-n = 3$
 $-1(-n) = -1(3)$
 $n = -3$

37. $-y - 5 = 11$
 $-y - 5 + 5 = 11 + 5$
 $-y = 16$
 $-1(-y) = -1(16)$
 $y = -16$

39. $12 - 2h = 8$
 $12 - 2h - 12 = 8 - 12$
 $-2h = -4$
 $\frac{-2h}{-2} = \frac{-4}{-2}$
 $h = 2$

B Apply Your Skills

Solve each equation.

40. $\frac{5}{7}x + \frac{1}{7} = 3$ 41. $\frac{a}{5} + 15 = 30$ 42. $-\frac{1}{5}t - 2 = 4$ 43. $-6 + 6z = 0$
44. $3.5 + 10m = 7.32$ 45. $7 = -2x + 7$ 46. $\frac{1}{2} = \frac{2}{5}c - 3$ 47. $10.7 = -d + 4.3$
48. $0.4x + 9.2 = 10$ 49. $4x + 92 = 100$ 50. $-t - 0.4 = -3$ 51. $-10t - 4 = -30$



Reading Math

For help with reading and solving Exercise 56, see p. 87.

Solve each equation. Justify each step.

52. $8 + \frac{c}{-4} = -6$ 53. $7 - 3k = -14$ 54. $14 = 6 - 2p$ 55. $\frac{-y}{2} + 14 = -1$

Define a variable and write an equation for each situation. Then solve.

56. **Mining** Beneath Earth's surface, the temperature increases 10°C every kilometer. Suppose that the surface temperature is 22°C , and the temperature at the bottom of a gold mine is 45°C . What is the depth of the gold mine?
57. **Insurance** One health insurance policy pays people for claims by multiplying the claim amount by 0.8 and then subtracting \$500. If a person receives a check for \$4650, how much was the claim amount?
58. **Library** The Library of Congress in Washington, D.C., is the largest library in the world. It contains nearly 125 million items. The library adds about 10,000 items to its collection daily. How many days will it take the library to reach about 150 million items?

Solve each equation. (*Hint: As your first step, multiply each side by the denominator of the fraction.*)

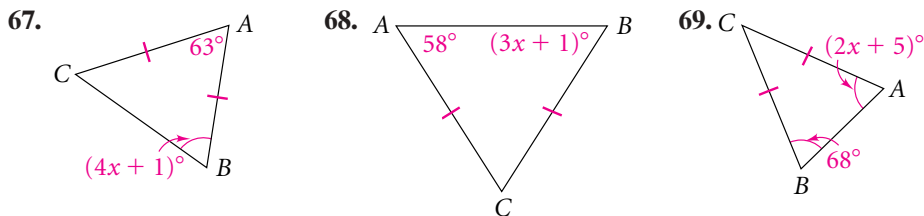
59. $\frac{x+2}{9} = 5$ 60. $\frac{y+1}{3} = 2$ 61. $\frac{a-10}{-4} = 2$ 62. $\frac{b-7}{2} = 6$
 63. $\frac{x-5}{2} = 10$ 64. $\frac{x-3}{7} = 12$ 65. $\frac{x+4}{3} = -8$ 66. $\frac{x+6}{4} = -7$

Real-World Connection

Since 1950, the size of the collections and the size of the staff of the Library of Congress have tripled.



Geometry In each triangle, the measure of $\angle A =$ the measure of $\angle B$. Find the value of x .



70. **Writing** Miles has saved \$40. He wants to buy a CD player for \$129 in about four months. To find how much he should save each week, he wrote $40 + 16x = 129$. Explain his equation.

Error Analysis What is the error in the work? Solve each equation correctly.

71.
$$\begin{aligned} 12 - 3y &= 15 \\ 3y &= 3 \\ y &= 1 \end{aligned}$$

72.
$$\begin{aligned} \frac{m}{3} - 9 &= -21 \\ \frac{m}{3} - 9 + 9 &= -21 + 9 \\ \frac{m}{3} &= -12 \\ m &= -4 \end{aligned}$$


73. **Open-Ended** Write a problem that you can model with a two-step equation. Write an equation and solve the problem.

74. You can find the value of each variable in the matrices below by writing and solving equations. For example, to find the value of a , you solve the equation $2a + 1 = 11$. Find the values of a , x , y , and k .

$$\begin{bmatrix} 2a + 1 & -6 \\ -7 & -3k \end{bmatrix} = \begin{bmatrix} 11 & x - 5 \\ 5 - 2y & 27 \end{bmatrix}$$

75. Critical Thinking If you multiply each side of $0.24r + 5.25 = -7.23$ by 100, the result is an equivalent equation. Explain why it might be helpful to do this.

Use the table at the right for Exercises 76 and 77.

 **76.** A formula for converting a temperature from Celsius C to Fahrenheit F is $F = 1.8C + 32$. Copy and complete the table. Round to the nearest degree.

| Fahrenheit | Celsius | Description of Temperature |
|------------|---------|----------------------------|
| 212° | ■ | boiling point of water |
| ■ | 37° | human body temperature |
| 68° | ■ | room temperature |
| ■ | 0° | freezing point of water |
| ■ | -40° | |

77. a. Estimation Use the formula $F = 2C + 30$ to estimate the Fahrenheit temperatures not shown in the table.

b. Critical Thinking Compare your estimated values with the actual values. How good is your formula at estimating the actual temperatures? Explain.

Solve the first equation for x . Then substitute your result into the second equation and solve for y .

78. $x + y = 8$
 $2x + 3y = 21$

79. $x + 2y = 1$
 $6x - y = -20$

80. $x + y = 12$
 $2x + y = 17$



Standardized Test Prep

Gridded Response

81. What is the value of the expression $-\frac{3}{5}x - 2$ when $x = -6$?

82. Dana has a photograph that is 4 in. wide and 5 in. long. She has the photo enlarged so that both dimensions are tripled. How many times larger than the original area will the area of the enlargement be?

83. What is the value of the following expression? $\frac{3^2 \times 4 - (-5)^2}{(-2)^3 + 3 \times 4}$

84. Last season, Everett scored 48 points. This is 6 less than twice the number of points Max scored. How many points did Max score?

85. A cable television company charges \$24.95 a month for basic cable service and \$6.95 a month for each additional premium channel. If Sami's monthly bill is \$45.80, how many premium channels is he receiving?



Take It to the NET

Online lesson quiz at www.PHSchool.com

Mixed Review

Lesson 2-1

Solve each equation.

86. $4s = 18$

87. $x - 3 = 9$

88. $\frac{m}{5} = 3$

89. $-7 = n + 2$

90. $7x = 42$

91. $3y = 99$

92. $5z = 57$

93. $8a = 48$

Lessons 1-3, 1-4

Simplify.

94. $-2 + 6$

95. $9 + (-3)$

96. $-7 + (-4)$

97. $16 + (-4)$