

EXERCISES**Practice and Problem Solving****A Practice by Example****Example 1**
(page 82)

Solve each equation. Check your answer.

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

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. $\frac{x}{5} + 9 = 11$
 $\frac{x}{5} + 9 - 9 = 11 - 9$
 $\frac{x}{5} = 2$
 $5\left(\frac{x}{5}\right) = 5(2)$
 $x = 10$
37. $-y - 5 = 11$
 $-y - 5 + 5 = 11 + 5$
 $-y = 16$
 $-1(-y) = -1(16)$
 $y = -16$
38. $18 - n = 21$
 $18 - n - 18 = 21 - 18$
 $-n = 3$
 $-1(-n) = -1(3)$
 $n = -3$
39. $12 - 2h = 8$
 $12 - 2h - 12 = 8 - 12$
 $-2h = -4$
 $\frac{-2h}{-2} = \frac{-4}{-2}$
 $h = 2$

3 Apply Your Skills

Solve each equation.

40. $\frac{5}{7}x + \frac{1}{7} = 3$ 41. $\frac{q}{5} + 15 = 30$ 42. $-\frac{1}{3}t - 2 = 4$ 43. $-6 + 6z = 0$
 44. $3.5 + 10m = 7.32$ 45. $7 = -2x + 7$ 46. $\frac{1}{2} = \frac{2}{3}c - 3$ 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.



Real-World Connection

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

Solve each equation. Justify each step.

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

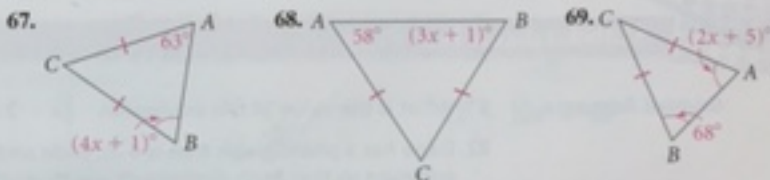
Define a variable and write an equation for each situation. Then solve.

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. $\frac{x+6}{4} = -7$

67. **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 .
- $$\begin{bmatrix} 2a + 1 & -6 \\ -7 & -3k \end{bmatrix} = \begin{bmatrix} 11 & x - 5 \\ 5 - 2y & 27 \end{bmatrix}$$