

EXERCISES

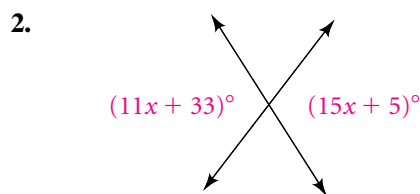
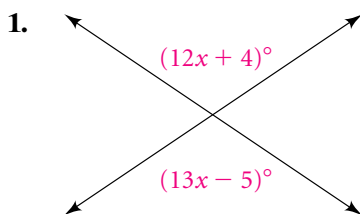
For more practice, see *Extra Practice*.

Practice and Problem Solving

A Practice by Example

Example 1 (page 97)

Geometry Find the value of x .



Solve each equation. Check your answer.

3. $6x - 2 = x + 13$

4. $5y - 3 = 2y + 12$

5. $4k - 3 = 3k + 4$

6. $5m + 3 = 3m + 9$

7. $8 - x = 2x - 1$

8. $2n - 5 = 8n + 7$

9. $3a + 4 = a + 18$

10. $6b + 14 = -7 - b$

11. $5a - 14 = -5 + 8a$

12. $3 + 4x = 3x + 6$

13. $30 - 7z = 10z - 4$

14. $8x - 3 = 7x + 2$

15. $-36 + 2w = -8w + w$

16. $4p - 10 = p + 3p - 2p$

Example 2 (page 97)

Write and solve an equation for each situation. Check the reasonableness of your solution.

17. **Telephone Service** One telephone company charges \$16.95 per month and \$.05 per minute for local calls. Another company charges \$22.95 per month and \$.02 per minute for local calls. For what number of minutes of local calls per month is the cost of the plans the same?

18. **Fitness** One health club charges a \$44 sign-up fee and \$30 per month. Another health club charges a \$99 sign-up fee and \$25 per month. For what number of months is the cost the same?

19. **Carpentry** Peter was building a porch. Placing boards of equal length from end to end, Peter found that 4 boards were 3 ft too long for the porch length, while 3 boards were 5 ft too short. How long was each board?

20. **Flying** You and a pilot friend decide to rent an airplane to do some sightseeing. One service charges \$100 plus \$80 per hour, while another charges \$250 plus \$70 per hour for the same airplane. At what number of hours is the cost the same?

Example 3 (page 98)

21. a. Use the equation $9 - 6x = 3(3 - 2x)$. Substitute four different values for x and simplify.

b. What kind of equation is $9 - 6x = 3(3 - 2x)$?

Determine whether each equation is an identity or whether it has no solution.

22. $14 - (2q + 5) = -2q + 9$

23. $6x + 1 = 6x - 8$

24. $-8x + 14 = -2(4x - 7)$

25. $y - 5 = -(5 - y)$

26. $a - 4a = 2a + 1 - 5a$

27. $9x + 3x - 10 = 3(3x + x)$

B Apply Your Skills

Solve each equation. If the equation is an identity, write *identity*. If it has no solution, write *no solution*.

28. $18x - 5 = 3(6x - 2)$

29. $9 + 5a = 2a + 9$

30. $3(x - 4) = 3x - 12$

31. $6x = 4(x + 5)$

32. $\frac{3}{5}k - \frac{1}{10}k = \frac{1}{2}k + 1$


33. $0.5y + 2 = 0.8y - 0.3y$


34. $5m - 2(m + 2) = -(2m + 15)$

35. $\frac{7}{8}w = \frac{4}{8}w + \frac{6}{8}w$

36. $0 = 0.98b + 0.02b - b$

37. $6(6g - 2) + 8(1 - 5g) = 2g$

 **38. Business** A toy company spends \$1500 each day for factory expenses plus \$8 per teddy bear which sells for \$12 each. How many bears must the company sell in one day to equal its daily costs? Write an equation and solve.

 **39. Business** A company manufactures tote bags. The company spends \$1200 each day for overhead expenses plus \$9 per tote bag for labor and materials. The tote bags sell for \$25 each. How many tote bags must the company sell each day to equal its daily costs for overhead, labor, and materials? Write an equation and solve.

Find the value of each variable.

$$40. \begin{bmatrix} 2x + 1 & a - 1 \\ w - 4 & 9y \end{bmatrix} = \begin{bmatrix} -5x - 6 & 5a \\ 3w + 4 & -3y \end{bmatrix} \quad 41. \begin{bmatrix} a + 1 & 4b \\ 2c + 3 & 5d - 3 \end{bmatrix} = \begin{bmatrix} 7 - a & 3b + 5 \\ 3c - 4 & 63 - d \end{bmatrix}$$

Find the value of each variable.

$$42. \begin{bmatrix} 0.5x + 3 & w + 1.5 \\ 2.5y + 2.5 & a + 1 \end{bmatrix} = \begin{bmatrix} x + 0.5 & 2w - 1.5 \\ 5y - 2.5 & 19 - a \end{bmatrix}$$

$$43. \begin{bmatrix} \frac{1}{2} + a & \frac{1}{2}b + 2 \\ c - \frac{1}{3} & \frac{1}{3}d + \frac{2}{3} \end{bmatrix} = \begin{bmatrix} 6\frac{1}{2} - a & b - 1 \\ 4\frac{2}{3} & d + \frac{4}{9} \end{bmatrix}$$

Error Analysis Find the mistake in the solution of each equation. Explain the mistake and solve the equation correctly.

44.

$$\begin{aligned} 2x &= 11x + 45 \\ 2x - 11x &= 11x - 11x + 45 \\ 9x &= 45 \\ \frac{9x}{9} &= \frac{45}{9} \\ x &= 5 \end{aligned}$$

45.

$$\begin{aligned} 4.5 - y &= 2(y - 5.7) \\ 4.5 - y &= 2y - 11.4 \\ 4.5 - y - y &= 2y - y - 11.4 \\ 4.5 &= y - 11.4 \\ 4.5 + 11.4 &= y - 11.4 + 11.4 \\ 15.9 &= y \end{aligned}$$

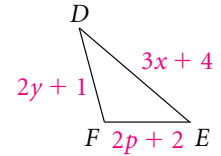
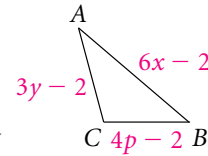


Need Help?

If triangles are congruent, then their corresponding angles are congruent and their corresponding sides are congruent.



46. **Geometry** $\triangle ABC$ is congruent to $\triangle DEF$. Find the lengths of the sides of $\triangle DEF$.



47. **Writing** Is an equation that has 0 for a solution the same as an equation with no solution? Explain.

48. **Spreadsheet** Don set up a spreadsheet to solve $5(x - 3) = 4 - 3(x + 1)$.
- Does Don's spreadsheet show a solution to the equation?
 - Between which two values of x is the solution to the equation? How do you know?
 - For what values of x is $4 - 3(x + 1)$ less than $5(x - 3)$?

	A	B	C
1	x	$5(x - 3)$	$4 - 3(x + 1)$
2	-5	-40	16
3	-3	-30	10
4	-1	-20	4
5	1	-10	-2
6	3	0	-8



Challenge

Open-Ended Write an equation with a variable on each side such that you get the solution described.

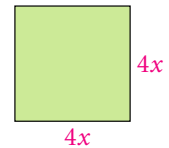
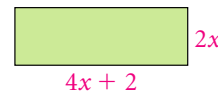
- $x = 0$
- x is a positive number.
- x is a negative number.
- All values of x are solutions.
- No values of x are solutions.
- $x = 1$
- Use the equations below to find the length of the pipe.



$$a + b = 15 \quad b - a = 3 \quad a + b - 12 = c$$



56. **Geometry** The perimeters of the rectangles at the right are equal. Find the length and width of each rectangle.

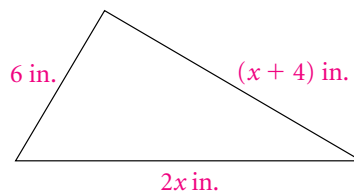
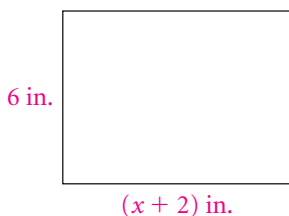




Standardized Test Prep

Multiple Choice

57. Solve $2y = 3y - 20$.
 A. -20 B. -4 C. 4 D. 20
58. Which of the following equations is NOT equivalent to the others?
 F. $-2(y - 3) = -6y$ G. $-2y - 6 = -6y$
 H. $y = -\frac{3}{2}$ I. $4y = -6$
59. Ace Truck Rental charges \$54.00 a day plus 9¢ per mile. Roni's Truck Rental charges \$38.00 a day plus 13¢ per mile. For how many miles will the cost of renting a truck for one day at Ace equal the cost at Roni's?
 A. 40 mi B. 170 mi C. 400 mi D. 418 mi
60. Which equation is NOT equivalent to $3p - 2 = 6p + 4$?
 F. $3p = 6p + 6$ G. $-6 = 3p$
 H. $3p = 6$ I. $-3p - 2 = 4$
61. A record store sells CDs for \$12.00 each. A music club offers 5 free CDs and charges \$15.00 for each additional CD. Which equation can you use to find the number of CDs x that would cost the same under both plans?
 A. $15x - 5 = 12x$ B. $12x - 5 = 15x$
 C. $12x = 15(x - 5)$ D. $12(x - 5) = 15x$
62. Solve $2(y - 3) = 1.2 - y$.
 F. -1.6 G. 1.4 H. 1.6 I. 2.4
63. The perimeters of the rectangle and the triangle below are equal. Find the value of x .
 A. 6 B. 8 C. 10 D. 12



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Mixed Review

Lesson 2-3

Solve each equation.

64. $9 = -4y + 6y - 5$ 65. $-2(a - 3) = 14$ 66. $0.5m + 2.8 = 3.64$
 67. $\frac{1}{2}x + 4 = \frac{2}{3}$ 68. $4.8 = 1.25(y - 17)$ 69. $4\left(\frac{1}{4} + x\right) = 5$

Lesson 2-2

70. **Art** An art gallery owner is framing a painting. The width of the painting to be displayed is 30 in. He wants the width of the framed painting to be $38\frac{1}{2}$ in. How wide should each section of the frame be?

Lesson 1-3

Write the numbers in each group in order from least to greatest.

71. $-\frac{3}{5}, -\frac{5}{8}, -\frac{4}{5}$ 72. 5.04, 5.009, 5.043 73. 8.1, 8.02, 8.3
 74. -100, 93, -87, 500 75. 0.45, -1.24, 2.24, 1.23 76. 9.7, -9.8, 8.6, 0.9