

EXERCISES

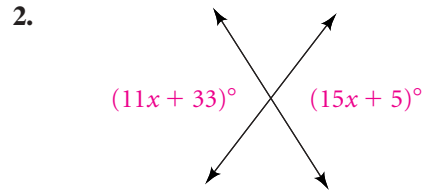
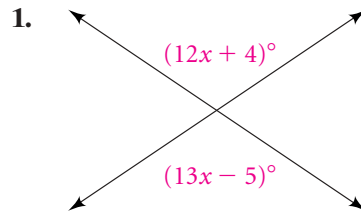
For more practice, see *Extra Practice*.

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, like the one shown at left. 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 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.

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

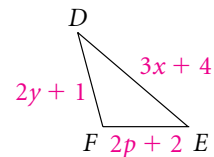
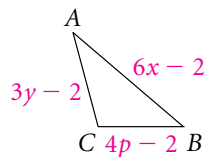


Need Help?

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 $5(x - 3)$?

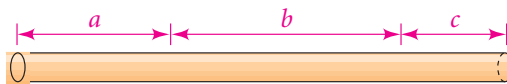
	A	B	C
1	x	$5(x - 3)$	$4 - 3(x + 1)$
2	-5	-40	16
3	-3	-30	10
4	-1	-20	4
5	1	-10	-2
6	3	0	-8



Challenge

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

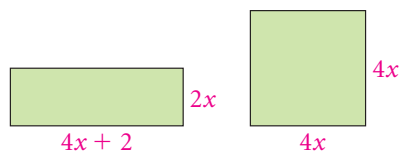
- $x = 0$
- x is a positive number.
- x is a negative number.
- All values of x are solutions.
- No values of x are solutions.
- $x = 1$
- Use the equations below to find the length of the pipe.



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



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

- Solve $2y = 3y - 20$.
A. -20 B. -4 C. 4 D. 20
- 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. $4y = -6$
- 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
- Which equation is NOT equivalent to $3p - 2 = 6p + 4$?
F. $3p = 6p + 6$ G. $-6 = 3p$
H. $3p = 6$ I. $-3p - 2 = 4$

