

EXERCISES

For more practice, see *Extra Practice*.

Practice and Problem Solving

A Practice by Example

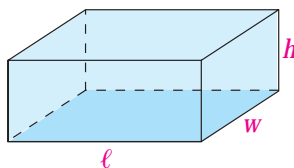
Example 1
(page 111)

Solve each formula in terms of the given variable.

1. $C = 2\pi r$, r 2. $\pi = \frac{C}{d}$; d 3. $P = 2\ell + 2w$; ℓ 4. $S = L + 2B$; B

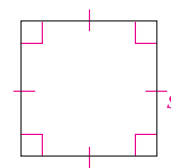
5. Volume of a rectangular prism

$$V = \ell wh; h$$



6. Perimeter of a square

$$P = 4s; s$$

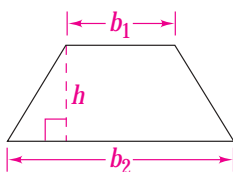


Problem Solving Hint

For Exercise 7, you can solve for b_1 by letting $(b_1 + b_2) = x$. Solve for x and then solve for b_1 .

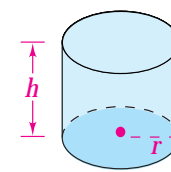
7. Area of a trapezoid

$$A = \frac{1}{2}h(b_1 + b_2); b_1$$



8. Volume of a cylinder

$$V = \pi r^2 h; h$$



Example 2
(page 112)

Solve each equation for y .

9. $y + 2x = 5$ 10. $y - 6x = -1$ 11. $y + 4x = 3$ 12. $2y + 4x = 8$

13. $3y - 5x = 9$ 14. $4y + 3x = 7$ 15. $5x + 4y = 4$ 16. $2x + 7y = 4$

Example 3
(page 112)

Solve each equation for the variable in red.

17. $dx = c$ 18. $c = \frac{d}{g}$ 19. $z - a = y$ 20. $ax + by = c$

21. $A = P + Prt$ 22. $S = C + rC$ 23. $\frac{m}{n} = \frac{p}{q}$ 24. $\frac{y \downarrow b}{m} = x$

Example 4
(page 112)

25. **Construction** Bricklayers use the formula $N = 7LH$ to estimate the number of bricks N needed to build a wall of height H and length L .

a. Solve the equation for H .

b. What is the height of a wall that is 30 feet long and that requires 2310 bricks to build?

26. **Sports** You can use the formula $a = \frac{h}{n}$ to find the batting average a of a batter who has h hits in n times at bat.

a. Solve the equation for h .

b. If a batter has a batting average of .265 and has been at bat 200 times, how many hits does the batter have?

B Apply Your Skills

27. a. **Banking** The formula $I = prt$ gives the amount of simple interest I earned by principal p at an annual interest rate r over t years. Solve this formula for p .

b. Find p if $r = 0.035$, $t = 4$, and $I = \$420$.

c. **Writing** What does the value p mean in your answer to part (b)?

28. **Sales Commission** Suppose that you sell shoes and get a 5% commission on your sales. Last week, your paycheck included \$24.71 in commissions.

a. Solve the formula $C = 0.05s$ for s , where C is the amount of commission and s is the amount of sales.

b. Find your sales.

Solve each equation for the variable in red.

29. $A = bh$

30. $y = \frac{2}{3}x + 8$

31. $ap - b = r$

32. $2(p + r) = 5$

33. $SA = 2\pi rh + 2B$

34. $2x + 10 = 5y - 4$

35. $\frac{a}{b} = \frac{c}{d}$

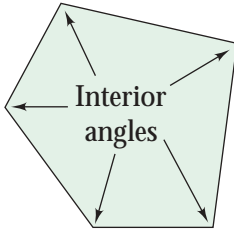
36. $\frac{m + k}{h} = w$

37. $V = \frac{1}{3}\pi r^2 h$

38. $3y + 2 = 9x - 4$

39. $y = 3(w - y)$

40. $3m = 2(4 + x)$



- 41. Geometry** To find S , the sum of the measures of the interior angles of a polygon with n sides, you can use the formula $S = (n - 2)180$.

- a.** Transform the formula to find the number of sides in terms of the interior angle sum. Solve this equation for n .
b. Complete the table at the right using your new formula.

S	n
540	■
900	■
360	■
1260	■

- 42. Writing** How is solving a literal equation similar to solving an equation that involves one variable? How is it different?

- 43. Open-Ended** Write an equation using three variables. Solve the equation for each variable. Show all your steps.



Challenge

- 44. Geometry** To find the coordinate of the midpoint of a segment with endpoints that have coordinates a and b , you can use the formula $m = \frac{a + b}{2}$.
a. Find the coordinate of the midpoint of a segment with endpoints 8.2 and 3.5.
b. Transform the formula to find b in terms of a and m .
c. A segment has midpoint 2.1. One endpoint is -1.7 . Find the other endpoint.

- 45. Recreation** The aspect ratio of a hang glider describes its ability to glide and soar. The formula $R = \frac{s^2}{A}$ gives the aspect ratio R for a glider with wingspan s and wing area A .
a. Solve this formula for A .
b. Suppose you want to design a glider with a 9-ft wingspan and an aspect ratio of 3. Use the formula you found in part (a) to find the wing area.

Real-World Connection

Careers Aeronautical engineers may design simple aircraft, like hang gliders, or complex superjets. Every aspect of design, from wingspan to the size of fuel containers, requires engineers to know and use formulas.

- 46. Health** The volume of air an adult's lungs can hold decreases with age. The formula $V = 0.104h - 0.018a - 2.69$ estimates air volume V (in liters) of a person's lungs for someone of height h inches and age a years. Solve this formula for age a .



Standardized Test Prep

Multiple Choice

47. You can find the cost of renting a hot-air balloon at Tavares Balloon Rental using the formula $C = 85 + 36h$, where C is the total cost and h is the number of hours rented. Solve this equation for h .
- A. $h = C - 121$ B. $h = \frac{C - 85}{36}$ C. $h = C - 85$ D. $h = \frac{C - 36}{85}$
48. Kelly, Ted, and Lauren opened savings accounts. Kelly started with \$80 and saves \$30 per month. Ted started with \$50 and saves twice as much as Kelly each month. Lauren started with twice as much as Kelly and saves one third as much as Ted each month. Let m represent the number of months each has been saving. Which expression represents the total amount of money saved by Kelly, Ted, and Lauren in m months?
- F. $290 + 270m$ G. $110 + 290m$ H. $270 + 290m$ I. $290 + 110m$
49. A rectangular table measures 36 in. by 48 in. A square game board that is 24 in. on each side is on the table. Which amount of the table's area is NOT covered by the game board?
- A. 264 in.^2 B. 1704 in.^2 C. 1152 in.^2 D. 1728 in.^2
50. The formula for the time that a traffic light remains yellow is $t = \frac{1}{8}s + 1$, where t is the time in seconds and s is the speed limit. If the light is yellow for 6 seconds, what is the speed limit in miles per hour?
- F. 56 G. 40 H. 10 I. 1.75



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Mixed Review

Lesson 2-5

51. The sum of three consecutive integers is 216. Find the integers.
52. The perimeter of a rectangle is 116 cm. The length is 10 cm greater than twice the width. What is the length of the rectangle?

Lesson 1-6

Multiply.

53. $12 \begin{bmatrix} -5 & \frac{3}{4} \end{bmatrix}$

54. $2 \begin{bmatrix} 7 & -3.1 \\ \frac{1}{4} & -8 \end{bmatrix}$

55. $-3 \begin{bmatrix} 5.2 & -9 & -1 \\ 0 & -8 & 9.5 \end{bmatrix}$



Checkpoint Quiz 2

Lessons 2-4 through 2-6



Instant self-check
quiz online and
on CD-ROM

Solve each equation.

1. $7x + 3 = 15x + 9$

2. $\frac{3}{4}n + 5 = \frac{2}{5}n$

3. $-\frac{1}{5}x - 8 = 4x + 3$

4. $5(2w - 4) = 6w$

5. $2y - 8 = -\frac{1}{2}(3 - 5y)$

6. $0.3a + 0.7 = 0.5a - 0.1$

Solve each equation for y .

7. $2x + 7y = 35$

8. $5x - 2y = 15$

9. $\frac{2}{3}x + \frac{3}{4}y = 9$

10. Two cars are traveling on the same highway. The first car is traveling at an average rate of 44 mi/h. The second car leaves an hour later traveling at an average rate of 55 mi/h. How long will the cars have traveled when the second car catches up with the first car?