

# 2

# CHAPTER REVIEW

@HomeTutor

my.hrw.com

- Multi-Language Glossary
- Vocabulary practice

## REVIEW KEY VOCABULARY

- |                     |                        |                    |
|---------------------|------------------------|--------------------|
| • square root       | • inverse operations   | • cross product    |
| • radicand          | • equivalent equations | • scale drawing    |
| • perfect square    | • identity             | • scale model      |
| • irrational number | • ratio                | • scale            |
| • real numbers      | • proportion           | • literal equation |

### VOCABULARY EXERCISES

1. Copy and complete: A(n) ? is a two-dimensional drawing of an object in which the dimensions of the drawing are in proportion to the dimensions of the object.
2. Copy and complete: When you perform the same inverse operation on each side of an equation, you produce a(n) ? equation.
3. *Explain* why the equation  $2x + 8x = 3x + 7x$  is an identity.
4. Copy and complete: In the proportion  $\frac{7}{8} = \frac{28}{32}$ ,  $7 \cdot 32$  and  $8 \cdot 28$  are ?.
5. *Describe* the steps you would take to write the equation  $6x - 2y = 16$  in function form.

## REVIEW EXAMPLES AND EXERCISES

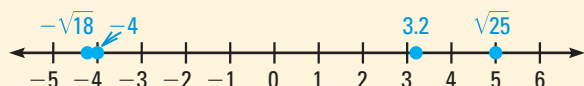
Use the review examples and exercises below to check your understanding of the concepts you have learned in each lesson of this chapter.

### 2.1

### Find Square Roots and Compare Real Numbers

#### EXAMPLE

Order the following numbers from least to greatest:  $\sqrt{25}$ ,  $-\sqrt{18}$ ,  $-4$ ,  $3.2$ .



From least to greatest, the numbers are  $-\sqrt{18}$ ,  $-4$ ,  $3.2$ , and  $\sqrt{25}$ .

#### EXERCISES

Evaluate the expression.

6.  $\sqrt{121}$

7.  $-\sqrt{36}$

8.  $\pm\sqrt{81}$

9.  $\pm\sqrt{225}$

Approximate the square root to the nearest integer.

10.  $\sqrt{97}$

11.  $-\sqrt{48}$

12.  $-\sqrt{142}$

13.  $\sqrt{300}$

Order the numbers in the list from least to greatest.

14.  $-\sqrt{49}$ ,  $-6.8$ ,  $2$ ,  $\sqrt{3}$ ,  $1.58$

15.  $1.25$ ,  $\sqrt{11}$ ,  $-0.3$ ,  $0$ ,  $-\sqrt{4}$

EXAMPLES  
1, 2, and 4  
for Exs. 6–15

## 2.2 Solve One-Step Equations

### EXAMPLE

Solve  $\frac{x}{5} = 14$ .

$$\frac{x}{5} = 14 \quad \text{Write original equation.}$$

$$5 \cdot \frac{x}{5} = 5 \cdot 14 \quad \text{Multiply each side by 5.}$$

$$x = 70 \quad \text{Simplify.}$$

**EXAMPLES**  
1, 2, 3, 4 and 5  
for Exs. 16–22

### EXERCISES

Solve the equation. Check your solution.

16.  $x - 4 = 3$

17.  $-8 + a = 5$

18.  $4m = -84$

19.  $-5z = 75$

20.  $11 = \frac{r}{6}$

21.  $-27 = \frac{3}{4}w$

22. **PARKS** A rectangular city park has an area of 211,200 square feet. If the length of the park is 660 feet, what is the width of the park?

## 2.3 Solve Two-Step Equations

### EXAMPLE

Solve  $4x - 9 = 3$ .

$$4x - 9 = 3 \quad \text{Write original equation.}$$

$$4x - 9 + 9 = 3 + 9 \quad \text{Add 9 to each side.}$$

$$4x = 12 \quad \text{Simplify.}$$

$$\frac{4x}{4} = \frac{12}{4} \quad \text{Divide each side by 4.}$$

$$x = 3 \quad \text{Simplify.}$$

**EXAMPLES**  
1 and 2  
for Exs. 23–28

### EXERCISES

Solve the equation. Check your solution.

23.  $9b + 5 = 23$

24.  $11 = 5y - 4$

25.  $\frac{n}{3} - 4 = 2$

26.  $\frac{3}{2}v + 2 = 20$

27.  $3t + 9t = 60$

28.  $-110 = -4c - 6c$

## 2.4 Solve Multi-Step Equations

## EXAMPLE

Solve  $5x - 2(4x + 3) = 9$ .

$$5x - 2(4x + 3) = 9 \quad \text{Write original equation.}$$

$$5x - 8x - 6 = 9 \quad \text{Distributive property}$$

$$-3x - 6 = 9 \quad \text{Combine like terms.}$$

$$-3x = 15 \quad \text{Add 6 to each side.}$$

$$x = -5 \quad \text{Divide each side by } -3.$$

## EXERCISES

Solve the equation. Check your solution.

29.  $3w + 4w - 2 = 12$

30.  $z + 5 - 4z = 8$

31.  $c + 2c - 5 - 5c = 7$

32.  $4y - (y - 4) = -20$

33.  $8a - 3(2a + 5) = 13$

34.  $16h - 4(5h - 7) = 4$

35.  $\frac{3}{2}(b + 1) = 3$

36.  $\frac{4}{3}(2x - 1) = -12$

37.  $\frac{6}{5}(8k + 2) = -36$

## EXAMPLES

1, 2, 3 and 4

for Exs. 29–37

## 2.5 Solve Equations with Variables on Both Sides

## EXAMPLE

Solve the equation, if possible.

$$-2(x - 5) = 7 - 2x \quad \text{Original equation}$$

$$-2x + 10 = 7 - 2x \quad \text{Distributive property}$$

$$-2x + 3 = -2x \quad \text{Subtract 7 from each side.}$$

▶ The equation  $-2x + 3 = -2x$  is not true because the number  $-2x$  cannot be equal to 3 more than itself. So, the equation has no solution.

## EXERCISES

Solve the equation, if possible.

38.  $-3z - 1 = 8 - 3z$

39.  $16 - 2m = 5m + 9$

40.  $2.9w + 5 = 4.7w - 7.6$

41.  $2y + 11.4 = 2.6 - 0.2y$

42.  $4(x - 3) = -2(6 - 2x)$

43.  $6(2a + 10) = 5(a + 5)$

44.  $\frac{1}{12}(48 + 24b) = 2(17 - 4b)$

45.  $1.5(n + 20) = 0.5(n + 60)$

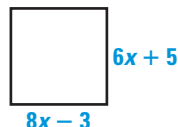
## EXAMPLES

1, 2, and 4

for Exs. 38–46

46.  **GEOMETRY** Refer to the square shown.a. Find the value of  $x$ .

b. Find the perimeter of the square.



## 2.6 Write Ratios and Proportions

### EXAMPLE

You know that 5 pizzas will feed 20 people. How many pizzas do you need to order to feed 88 people?

$$\frac{5}{20} = \frac{x}{88} \quad \begin{array}{l} \leftarrow \text{number of pizzas} \\ \leftarrow \text{number of people} \end{array}$$

$$88 \cdot \frac{5}{20} = 88 \cdot \frac{x}{88} \quad \text{Multiply each side by 88.}$$

$$22 = x \quad \text{Simplify.}$$

▶ You need to order 22 pizzas.

### EXERCISES

Solve the proportion. Check your solution.

$$47. \frac{56}{16} = \frac{x}{2}$$

$$48. \frac{y}{9} = \frac{25}{15}$$

$$49. \frac{2}{7} = \frac{m}{91}$$

$$50. \frac{5z}{3} = \frac{105}{6}$$

$$51. \frac{9}{4} = \frac{3a}{20}$$

$$52. \frac{c+2}{45} = \frac{8}{5}$$

53. **PAINTING** The label on a can of paint states that one gallon of the paint will cover 560 square feet. How many gallons of that paint are needed to cover 1400 square feet?

### EXAMPLES 2 and 3

for Exs. 47–53

## 2.7 Solve Proportions Using Cross Products

### EXAMPLE

Solve the proportion  $\frac{3}{10} = \frac{12}{x}$ .

$$\frac{3}{10} = \frac{12}{x} \quad \text{Write original proportion.}$$

$$3 \cdot x = 10 \cdot 12 \quad \text{Cross products property}$$

$$3x = 120 \quad \text{Simplify.}$$

$$x = 40 \quad \text{Divide each side by 3.}$$

### EXERCISES

Solve the proportion. Check your solution.

$$54. \frac{5}{7} = \frac{20}{r}$$

$$55. \frac{6}{z} = \frac{12}{5}$$

$$56. \frac{126}{56} = \frac{9}{4b}$$

$$57. \frac{10}{3m} = \frac{-5}{6}$$

$$58. \frac{n+8}{5n-2} = \frac{3}{8}$$

$$59. \frac{5-c}{3} = \frac{2c+2}{-4}$$

60. **MAPS** A map has a scale of 1 cm : 12 km. The distance between two cities on the map is 6.8 centimeters. Estimate the actual distance between the cities.

### EXAMPLES 1 and 4

for Exs. 54–60

## 2.8 Rewrite Equations and Formulas

## EXAMPLE

Write  $5x + 4y - 7 = 5$  so that  $y$  is a function of  $x$ .

$$5x + 4y - 7 = 5 \quad \text{Write original equation.}$$

$$5x + 4y = 12 \quad \text{Add 7 to each side.}$$

$$4y = 12 - 5x \quad \text{Subtract } 5x \text{ from each side.}$$

$$y = 3 - \frac{5}{4}x \quad \text{Divide each side by 4.}$$

## EXERCISES

Write the equation so that  $y$  is a function of  $x$ .

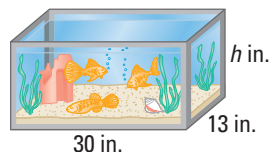
61.  $x + 7y = 0$

62.  $3x = 2y - 18$

63.  $4y - x = 20 - y$

64. **AQUARIUMS** A pet store sells aquariums that are rectangular prisms. The volume  $V$  of an aquarium is given by the formula  $V = lwh$  where  $l$  is the length,  $w$  is the width, and  $h$  is the height.

- Solve the formula for  $h$ .
- Use the rewritten formula to find the height of the aquarium shown, which has a volume of 5850 cubic inches.



## EXAMPLES

## 2 and 3

for Exs. 61–64