CHAPTER REVIEW

REVIEW KEY VOCABULARY

- variable
- algebraic expression
- evaluate an algebraic expression
- power, exponent, base
- order of operations

- verbal model
- rate, unit rate
- equation, inequality
- open sentence
- solution of an equation or inequality

- formula
- precision
- significant digits
- function, domain, range
- independent variable
- dependent variable

VOCABULARY EXERCISES

In Exercises 1–3, copy and complete the statement.

1. In the power 7^{12}, _?_ is the base and _?_ is the exponent.

2. A(n) _?_ is a statement that contains the symbol =.

3. A(n) _?_ is an expression that includes at least one variable.

4. **WRITING** *Describe* how you can tell by looking at the graph of a function which variable is the input variable and which is the output variable.

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.

1.1 Evaluate Expressions

EXAMPLE

Evaluate $6 - n$ when $n = 4$.

$6 - n = 6 - 4$ **Substitute 4 for *n*.**

$ = 2$ **Simplify.**

EXERCISES

**EXAMPLES
1, 4, and 5**
for Exs. 5–12

Evaluate the expression.

5. $3 + x$ when $x = 13$

6. $y - 2$ when $y = 18$

7. $\dfrac{20}{k}$ when $k = 2$

8. $40w$ when $w = 0.5$

9. z^2 when $z = 20$

10. w^3 when $w = 0.1$

11. **DVD STORAGE** A DVD storage sleeve has the shape of a square with an edge length of 5 inches. What is the area of the front of the sleeve?

12. **NOTEPAPER** You store square notepaper in a cube-shaped box with an inside edge length of 3 inches. What is the volume of the box?

1.2 Apply Order of Operations

EXAMPLE

Evaluate $(5 + 3)^2 \div 2 \times 3$.

$$(\mathbf{5 + 3})^2 \div 2 \times 3 = \mathbf{8}^2 \div 2 \times 3 \quad \text{Add within parentheses.}$$
$$= 64 \div 2 \times 3 \quad \text{Evaluate power.}$$
$$= 32 \times 3 \quad \text{Divide.}$$
$$= 96 \quad \text{Multiply.}$$

EXERCISES

EXAMPLES 1, 2, and 3
for Exs. 13–21

Evaluate the expression.

13. $12 - 6 \div 2$

14. $1 + 2 \cdot 9^2$

15. $3 + 2^3 - 6 \div 2$

16. $15 - (4 + 3^2)$

17. $\dfrac{20 - 12}{5^2 - 1}$

18. $50 - [7 + (3^2 \div 2)]$

Evaluate the expression when $x = 4$.

19. $15x - 8$

20. $3x^2 + 4$

21. $2(x - 1)^2$
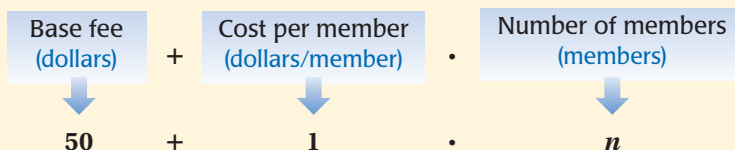
1.3 Write Expressions

EXAMPLE

Write an expression for the entry fee in a jazz band competition if there is a base fee of $50 and a charge of $1 per member.

Write a verbal model. Then translate the verbal model into an algebraic expression. Let n represent the number of band members.

Base fee (dollars)	+	Cost per member (dollars/member)	·	Number of members (members)
50	+	1	·	n

▶ An expression for the entry fee (in dollars) is $50 + n$.

EXERCISES

EXAMPLES 1, 2, and 3
for Exs. 22–27

Translate the verbal phrase into an expression.

22. The sum of a number k and 7

23. 5 less than a number z

24. The quotient of a number k and 12

25. 3 times the square of a number x

26. TOLL ROADS A toll road charges trucks a toll of $3 per axle. Write an expression for the total toll for a truck.

27. SCHOOL SUPPLIES You purchase some notebooks for $2.95 each and a package of pens for $2.19. Write an expression for the total amount (in dollars) that you spend.

1.4 Write Equations and Inequalities

EXAMPLE

Write an inequality for the sentence "The sum of 3 and twice a number k is no more than 15". Then check whether 4 is a solution of the inequality.

An inequality is $3 + 2k \leq 15$.

To check whether 4 is a solution of the inequality, substitute 4 for k.

$3 + 2(4) \overset{?}{\leq} 15$ **Substitute 4 for k.**

$11 \leq 15$ ✓ **The solution checks. So, 4 is a solution.**

EXERCISES

EXAMPLES 1 and 2
for Exs. 28–32

Write an equation or an inequality.

28. The product of a number z and 12 is 60.

29. The sum of 13 and a number t is at least 24.

Check whether the given number is a solution of the equation or inequality.

30. $3x - 4 = 10; 5$ **31.** $4y - 2 \geq 2; 3$ **32.** $2d + 4 < 9d - 7; 3$

1.5 Use a Problem Solving Plan

EXAMPLE

A rectangular banner is 12 feet long and has an area of 60 square feet. What is the perimeter of the banner?

STEP 1 **Read and Understand** You know the length of the rectangular banner and its area. You want to find the perimeter.

STEP 2 **Make a Plan** Use the area formula for a rectangle to find the width. Then use the perimeter formula for a rectangle.

STEP 3 **Solve the Problem** Substituting 12 for ℓ in the formula $A = \ell w$, $60 = 12w$. Because $12 \cdot 5 = 60$, $w = 5$. Then substituting 12 for ℓ and 5 for w in the formula $P = 2\ell + 2w$, $P = 2(12) + 2(5) = 34$ feet.

STEP 4 **Look Back** Use estimation. Since $\ell \approx 10$ and $A = 60$, $w \approx 6$. Then $P \approx 2(10) + 2(6) = 32$ feet, so your answer is reasonable.

EXERCISES

EXAMPLES 1, 2, and 3
for Exs. 33–34

33. U.S. HISTORY The flag that inspired the national anthem was a rectangle 30 feet wide and 42 feet long. Pieces of the flag have been lost. It is now 30 feet wide and 34 feet long. How many square feet have been lost?

34. PATTERNS A grocery clerk stacks three rows of cans of fruit for a display. Each of the top two rows has 2 fewer cans than the row beneath it. There are 30 cans altogether. How many cans are there in each row?

1.6 Use Precision and Measurement

EXAMPLE

Determine the number of significant digits in the measurement 7020 kilometers.

The digits 7 and 2 are nonzero digits, so they are significant digits.
There is a zero between two significant digits, so that is a significant digit.
Because 7020 is a whole number, the zero at the end is nonsignificant.

There are 3 significant digits.

EXERCISES

Determine the number of significant digits in the measurement.

35. 15.02 meters   **36.** 10.302 miles   **37.** 0.0020 centimeters

38. PRECISION In a woodworking class, students measure a board that has a length of exactly 30.25 centimeters. Lorraine reports the length to be 303 millimeters. Arnie reports the length to be 30 centimeters. Whose measurement is more precise?

1.7 Represent Functions as Rules and Tables

EXAMPLE

The domain of the function $y = 3x - 5$ is 2, 3, 4, and 5. Make a table for the function, then identify the range of the function.

x	2	3	4	5
$y = 3x - 5$	$3(2) - 5 = 1$	$3(3) - 5 = 4$	$3(4) - 5 = 7$	$3(5) - 5 = 10$

The range of the function is 1, 4, 7, and 10.

EXERCISES

Make a table for the function. Identify the range of the function.

39. $y = x - 5$
Domain: 10, 12, 15, 20, 21

40. $y = 3x + 1$
Domain: 0, 2, 3, 5, 10

Write a rule for the function.

41.

Input, x	0	2	4	5
Output, y	4	6	8	9

42.

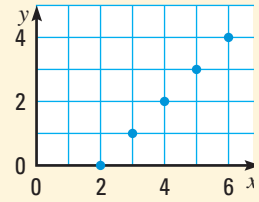| Input, x	0	3	4	6
Output, y	0	15	20	30

1.8 Represent Functions as Graphs

EXAMPLE

Write a rule for the function represented by the graph. Identify the domain and the range of the function.

Make a table for the graph.

x	2	3	4	5	6
y	0	1	2	3	4

Each y-value is 2 less than the corresponding x-value. A rule for the function is $y = x - 2$. The domain is 2, 3, 4, 5, and 6. The range is 0, 1, 2, 3, and 4.

EXERCISES

**EXAMPLES
1, 3, and 4**
for Exs. 43–44

43. Graph the function $y = 4x - 3$ with domain 1, 2, 3, 4, and 5.

44. Write a rule for the function represented by the graph. Identify the domain and the range of the function.