Page 31 and 38 answers

SKILL PRACTICE

A   1. **VOCABULARY** Give an example of a formula. **Sample answer: d = rt**

2. ★ **WRITING** *Describe* how you can use a formula to solve the following problem: The inner edges of a cube-shaped pot have a length of 1.5 feet. How much does it cost to fill the planter if soil costs $4 per cubic foot? **See margin.**

EXAMPLES
1 2
28–29
s 3–5

READING AND UNDERSTANDING In Exercises 3–5, identify what you know and what you need to find out. You do *not* need to solve the problem.

3. **CRAFT SHOW** You make 35 dog collars and anticipate selling all of them at a craft show. You spent $85 for materials and hope to make a profit of $90. How much should you charge for each collar? **See margin.**

4. **DISTANCE RUNNING** A runner ran at a rate of 0.15 mile per minute for 40 minutes. The next day, the runner ran at a rate of 0.16 mile per minute for 50 minutes. How far did the runner run altogether? **14 mi**

5. **TEMPERATURE** One day, the temperature in Rome, Italy, was 30°C. The temperature in Dallas, Texas, was 83°F. Which temperature was higher? **See margin.**

ERROR ANALYSIS *Describe* and correct the error(s) in solving the problem. A town is fencing a rectangular field that is 200 feet long and 150 feet wide. At $10 per foot, how much will it cost to fence the field? **6, 7. See margin.**

6.
$$P = 200 + 150 = 350$$
$$\$10(350) = \$3500$$ ✗

7.
$$A = (200)(150) = 30{,}000$$
$$\$10(30{,}000) = \$300{,}000$$ ✗

EXAMPLE 3 **B**
30
s. 8–12

CHOOSING A FORMULA In Exercises 8–10, state the formula that is needed to solve the problem. You do *not* need to solve the problem.

8. The temperature is 68°F. What is the temperature in degrees Celsius? $C = \frac{5}{9}(F - 32)$

9. A store buys a baseball cap for $5 and sells it for $20. What is the profit? $P = I - E$

10. Find the area of a triangle with a base of 25 feet and a height of 8 feet. $A = \frac{1}{2}bh$

11. ★ **MULTIPLE CHOICE** What is the interest on $1200 invested for 2 years in an account that earns simple interest at a rate of 5% per year? **C**

   Ⓐ $12   Ⓑ $60   Ⓒ $120   Ⓓ $240

12. ★ **MULTIPLE CHOICE** A car travels at an average speed of 55 miles per hour. How many miles does the car travel in 2.5 hours? **D**

   Ⓐ 22 miles   Ⓑ 57.5 miles   Ⓒ 110 miles   Ⓓ 137.5 miles

C   13. **CHALLENGE** Write a formula for the length l of a rectangle given its perimeter P and its width w. *Justify* your thinking.
$l = \frac{P}{2} - w$. **Sample answer: Dividing the perimeter by 2 will give the sum of the length and the width. Subtracting the width will give the length.**

1.5 Use a Problem Solving Plan   **31**

Differentiated Instruction

PROBLEM SOLVING

14. DVD STORAGE A stackable storage rack holds 22 DVDs and costs $21. How much would it cost to buy enough racks to hold 127 DVDs? **$126**

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15. FRAMING For an art project, you make a square print with a side length of 8 inches. You make a frame using strips of wood $1\frac{1}{4}$ inches wide. What is the area of the frame? **110.25 in.²**

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16. MOUNTAIN BOARDS You have saved $70 to buy a mountain board that costs $250. You plan to save $10 each week. How many weeks will it take to save for the mountain board? **18 wk**

17. HIKING You are hiking. The total weight of your backpack and its contents is $13\frac{3}{8}$ pounds. You want to carry no more than 15 pounds. How many extra water bottles can you add to your backpack if each bottle weighs $\frac{3}{4}$ pound? **2 water bottles**

18. PIZZA Thick crust pizza requires about 0.15 ounce of dough per square inch of surface area. You have two rectangular pans, one that is 16 inches long and 14 inches wide, and one that is 15.5 inches long and 10 inches wide. How much more dough do you need to make a thick crust pizza in the larger pan than in the smaller one? **10.35 oz**

19. SONAR A diver uses a sonar device to determine the distance to her diving partner. The device sends a sound wave and records the time it takes for the wave to reach the diving partner and return to the device. Suppose the wave travels at a rate of about 4800 feet per second.

a. The wave returns 0.2 second after it was sent. How far did the wave travel? **960 ft**

b. How far away is the diving partner? **480 ft**

20. ★ EXTENDED RESPONSE A gardener is reseeding a city park that has the shape of a right triangle with a base of 150 feet and a height of 200 feet. The third side of the park is 250 feet long.

a. One bag of grass seed covers 3750 square feet and costs $27.50. How many bags are needed? What is the total cost? **4 bags; $110**

b. Wire fencing costs $23.19 for each 50 foot roll. How much does it cost to buy fencing to enclose the area? **$278.28**

c. Fence posts cost $3.19 each and should be placed every 5 feet. How many posts are needed, and how much will they cost altogether? *Explain.* **See margin.**

○ = **WORKED-OUT SOLUTIONS** on p. WS1   ★ = **STANDARDIZED TEST PRACTICE**   ◆ = **MULTIPLE REPRESENTATIONS**

21. ◆ **MULTIPLE REPRESENTATIONS** Homeowners are building a square closet in a rectangular room that is 24 feet long and 18 feet wide. They want the remaining floor area to be at least 400 square feet. Because they don't want to cut any of the 1 foot by 1 foot square floor tiles, the side length of the closet floor should be a whole number of feet.

　　a. **Making a Table** Make a table showing possible side lengths of the closet floor and the remaining area for each side length. **See margin.**

　　b. **Writing an Inequality** Write an inequality to describe the situation. Use your table to find the greatest possible side length of the closet floor. **1 ≤ s ≤ 5; 5 ft**

22. ★ **SHORT RESPONSE** A farmer plans to build a fence around a rectangular pen that is 16 feet long. The area of the pen is 80 square feet. Is 40 feet of fencing enough to fence in the pen? *Explain.* **No.** *Sample answer:* **The width of the pen is 5 feet long. The farmer would need 2(5) + 2(16) = 42 feet of fencing.**

[C] 23. **CHALLENGE** You and your friend live 12 miles apart. You leave home at the same time and travel toward each other. You walk at a rate of 4 miles per hour and your friend bicycles at a rate of 11 miles per hour.

　　a. How long after you leave home will you meet? How far from home will each of you be? **48 min; you: 3.2 mi, your friend: 8.8 mi**

　　b. Suppose your friend bicycles at a rate of 12 miles per hour. How much sooner will you meet? How far from home will each of you be? **3 min; you: 3 mi, your friend: 9 mi**

MIXED REVIEW

Write the decimal as a fraction and as a percent. *(p. 916)*

24. 0.85　$\frac{17}{20}$**; 85%**　　25. 1.25　$1\frac{1}{4}$**; 125%**　　26. 0.245　$\frac{49}{200}$**; 24.5%**　　27. 0.007　$\frac{7}{1000}$**; 0.7%**

28. Find the surface area and volume of the rectangular prism. *(p. 927)*
52 ft^2, 24 ft^3

Translate the verbal phrase into an expression. *(p. 15)*

29. $\frac{1}{3}$ multiplied by a number v　$\frac{1}{3}v$　　　30. 22 divided by a number h　$\frac{22}{h}$

31. 7 more than twice a number m　　　　32. Twice the sum of a number y and 3
2m + 7　　　　　　　　　　　　　　　　　**2(y + 3)**

QUIZ *for Lessons 1.4–1.5*

Write an equation or an inequality. *(p. 21)*

1. 4 more than twice a number n is equal to 25.　**2n + 4 = 25**

2. The quotient of a number x and 2 is no more than 9.　$\frac{x}{2} \le 9$

Check whether the given number is a solution of the equation or inequality. *(p. 21)*

3. $13 - 2x = 5$; 4　**solution**　　4. $5d - 4 \ge 16$; 4　**solution**　　5. $4y + 3 \ge 15$; 3　**solution**

6. **CAR TRAVEL** One car travels about 28.5 miles on each gallon of gas. Suppose the average price of gas is $2 per gallon. About how much would the gas for a 978 mile trip cost? *(p. 28)* **about $68.63**

TABLES Make a table for the function. Identify the range of the function.
14–19. See margin.

14. $y = x - 3$
Domain: 12, 15, 22, 30

15. $y = x + 3.5$
Domain: 4, 5, 7, 8, 12

16. $y = 3x + 4$
Domain: 0, 5, 7, 10

17. $y = \frac{1}{2}x + 3$
Domain: 4, 6, 9, 11

18. $y = \frac{2}{3}x + \frac{1}{3}$
Domain: 4, 6, 8, 12

19. $y = \frac{0.5x + 1}{2}$
Domain: 0, 2, 4, 6

FUNCTION RULES Write a rule for the function.

20.

Input, x	0	1	2	3
Output, y	2.2	3.2	4.2	5.2

$y = x + 2.2$

21.

Input, x	15	20	21	30	42
Output, y	7	12	13	22	34

$y = x - 8$

22. **CHALLENGE** Fill in the table in such a way that when t is the independent variable, the pairing is a function, and when t is the dependent variable, the pairing is not a function.

Sample answer:

t	? 1	? 2	? 3	? 4
v	? 2	? 2	? 3	? 3

PROBLEM SOLVING

23. ◆.**MULTIPLE REPRESENTATIONS** You have 10 quarters that you can use for a parking meter.

  a. **Describing in Words** Copy and complete: Each time you put 1 quarter in the meter, you have 1 less quarter, so ? is a function of ?.

  b. **Writing a Rule** Write a rule for the number y of quarters that you have left as a function of the number x of quarters you have used so far. Identify the domain of the function. $y = 10 - x$; domain: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10

  c. **Making a Table** Make a table and identify the range of the function.

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  Range: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10; see margin.

24. ◆.**MULTIPLE REPRESENTATIONS** At a yard sale, you find 5 paperback books by your favorite author. Each book is priced at $.75.

  a. **Describing in Words** Copy and complete: For each book you buy, you spend $.75, so ? is a function of ?. amount of money you spend; the number of books you buy

  b. **Writing a Rule** Write a rule for the amount (in dollars) you spend as a function of the number of books you buy. Identify the domain of the function. $y = \$.75x$; domain: 0, 1, 2, 3, 4, and 5

  c. **Making a Table** Make a table and identify the range of the function.

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  Range: 0, 0.75, 1.5, 2.25, 3, and 3.75; see margin.

25. **SAVINGS** You have $100 saved and plan to save $20 each month. Write a rule for the amount saved (in dollars) as a function of the number of months from now. Identify the independent and dependent variables, the domain, and the range. How much will you have saved altogether 12 months from now? $y = 100 + 20m$; independent variable: m, the number of months; dependent variable: y, the amount of money saved; domain: $m > 0$, range: $y \geq 100$; $340

26. • •**OPEN-ENDED** Write a function rule that models a real-world situation. Identify the independent variable and the dependent variable.
  Sample answer: $W = 8h$, where W is wages and h is hours worked; the independent variable is h, the dependent variable is W.

B 27. ★ **SHORT RESPONSE** Consider a pairing of the digits 2 through 9 on a telephone keypad with the associated letters.

    a. Make a table showing the pairing with the digits as inputs and the letters as outputs. Is the pairing a function? *Explain*.

    b. Make a table showing the pairing with the letters as inputs and the digits as outputs. Is the pairing a function? *Explain*.

28. **MULTI-STEP PROBLEM** The table shows the fuel efficiency of four compact cars from one manufacturer for model year 2004.

City fuel efficiency (mi/gal), c	24	26	27	28
Highway fuel efficiency (mi/gal), h	32	34	35	36

    a. Write a Rule Use the table to write a rule for the cars' highway fuel efficiency as a function of their city fuel efficiency. $h = c + 8$

    b. Predict Another of the manufacturer's compact cars has a city fuel efficiency of 30 miles per gallon. Predict the highway fuel efficiency. **38 mi/gal**

    c. Calculate A study found that if gas costs $2 per gallon, you can use the expression $\frac{11,550}{c} + \frac{9450}{h}$ to estimate a car's annual fuel cost (in dollars) for a typical driver. Evaluate the expression for the car in part (b). **about $634**

C 29. **CHALLENGE** Each week you spend a total of 5 hours exercising. You swim part of the time and bike the rest.

300 calories per hour   440 calories per hour

    a. Write a rule for the total number of calories you burn for the whole 5 hours as a function of the time you spend swimming. $c = 300s + 440(5 - s)$

    b. One week you spend half the time swimming. How many calories do you burn during the whole 5 hours? **1850 cal**

MIXED REVIEW

Plot the point in a coordinate plane. *(p. 921)* **30–33. See margin.**

30. $A(1, 3)$ 31. $B(3, 1)$ 32. $C(2, 4)$ 33. $D(6, 2)$

Write an equation or an inequality. *(p. 21)*

34. The difference of 13 and a number w is 5. **$13 - w = 5$**

35. The quotient of 21 and a number d is no less than 7. **$\frac{21}{d} \geq 7$**

36. **TRAVEL** On a 1375 mile flight, an airplane's average speed is 550 miles per hour. The flight is within a single time zone and leaves at 10 A.M. What time will the airplane arrive at its destination? *(p. 28)* **12:30 P.M.**