

## 3-4 Using Formulas (Pages 134–137)

Formulas can help you solve many different types of problems. A **formula** shows the relationship among certain quantities. For example, to find the number of miles per gallon that a car gets, you can use the following formula: miles driven ( $m$ ) divided by gallons of gas used ( $g$ ) equals miles per gallon (mpg), or  $m \div g = \text{mpg}$ .

### EXAMPLE

Fred bought a sport utility vehicle (SUV), but now he is concerned about the amount of gas it is using. If Fred needs to refill the 25-gallon tank after driving 350 miles, what gas mileage is his SUV getting?

$$\begin{aligned} m \div g &= \text{mpg} && \text{Use the formula.} \\ 350 \div 25 &= \text{mpg} && \text{Replace } m \text{ with } 350 \text{ and } g \text{ with } 25. \\ 350 \div 25 &= 14 \text{ mpg} && \text{Fred's SUV only gets } 14 \text{ miles per gallon.} \end{aligned}$$

### PRACTICE

**Solve by replacing the variables in each formula with the given values.**

- $A = \ell w$ , if  $\ell = 12$  and  $w = 9$
- $S = (n - 2)180$ , if  $n = 4$
- $I = \frac{1}{20}pt$ , if  $p = 500$  and  $t = 2$
- $A = \frac{bh}{2}$ , if  $b = 7$  and  $h = 10$
- $d = 50t$ , if  $d = 350$
- $P = 2\ell + 2w$ , if  $P = 40$  and  $\ell = 6$
- $C = \frac{5}{9}(F - 32)$ , if  $F = 32$
- $S = \frac{n(n + 1)}{2}$ , if  $n = 12$
- Physics** The density  $d$  of a substance is given by the formula  $d = \frac{m}{v}$ , where  $m$  is the mass of a sample of the substance and  $v$  is the volume of the sample. Solve  $d = \frac{m}{v}$  if  $m = 14$  and  $v = 2$ .
- Food** The formula for the circumference of a circle is  $C = 2\pi r$ , where  $r$  is the radius of the circle and  $\pi$  is a constant that is about 3.14. If a pizza has a radius of 8 inches, what is the circumference of the pizza? Round your answer to the nearest inch.



- 11. Standardized Test Practice** A train leaves Station A at 11:12 A.M. and arrives at Station B at 2:42 P.M. The train travels at a speed of 80 miles per hour. How many miles does the train travel?

**A** 216 mi                      **B** 280 mi                      **C** 200 mi                      **D** 680 mi

Answers: 1. 108 2. 360 3. 50 4. 35 5. 7 6. 14 7. 0 8. 78 9. 7 10. 50 in. 11. B