

# 1.5 Use Problem Solving Strategies and Models

TEKS *a.5, a.6, 2A.2.A, A.7.A*

**Before**

You wrote and solved equations.

**Now**

You will solve problems using verbal models.

**Why?**

So you can solve constant rate problems, as in Ex. 26.



## Key Vocabulary

- verbal model

As you have seen in this chapter, it is helpful when solving real-life problems to write an equation in words *before* you write it in mathematical symbols. This word equation is called a **verbal model**.

Sometimes problem solving strategies can be used to write a verbal or algebraic model. Examples of such strategies are *use a formula*, *look for a pattern*, and *draw a diagram*.

### EXAMPLE 1 Use a formula

**HIGH-SPEED TRAIN** The Acela train travels between Boston and Washington, a distance of 457 miles. The trip takes 6.5 hours. What is the average speed?

#### Solution

You can use the formula for distance traveled as a verbal model.

$$\begin{array}{ccccc} \text{Distance} & = & \text{Rate} & \cdot & \text{Time} \\ \text{(miles)} & & \text{(miles/hour)} & & \text{(hours)} \\ \downarrow & & \downarrow & & \downarrow \\ 457 & = & r & \cdot & 6.5 \end{array}$$

An equation for this situation is  $457 = 6.5r$ . Solve for  $r$ .

$$457 = 6.5r \quad \text{Write equation.}$$

$$70.3 \approx r \quad \text{Divide each side by 6.5.}$$

► The average speed of the train is about 70.3 miles per hour.

**CHECK** You can use unit analysis to check your answer.

$$457 \text{ miles} \approx \frac{70.3 \text{ miles}}{1 \text{ hour}} \cdot 6.5 \text{ hours}$$

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### GUIDED PRACTICE for Example 1

1. **AVIATION** A jet flies at an average speed of 540 miles per hour. How long will it take to fly from New York to Tokyo, a distance of 6760 miles?