

**RATES** A **rate** is a fraction that compares two quantities measured in different units. If the denominator of the fraction is 1 unit, the rate is called a **unit rate**.

**EXAMPLE 4 Find a unit rate**

**READING**

Per means “for each” or “for every” and can also be represented using the symbol /, as in mi/h.

A car travels 110 miles in 2 hours. Find the unit rate.

$$\frac{110 \text{ miles}}{2 \text{ hours}} = \frac{110 \text{ miles} \div 2}{2 \text{ hours} \div 2} = \frac{55 \text{ miles}}{1 \text{ hour}}$$

► The unit rate is 55 miles per hour, or 55 mi/h.



**EXAMPLE 5 TAKS REASONING: Multi-Step Problem**

**CELL PHONES** Your basic monthly charge for cell phone service is \$30, which includes 300 free minutes. You pay a fee for each extra minute you use. One month you paid \$3.75 for 15 extra minutes. Find your total bill if you use 22 extra minutes.

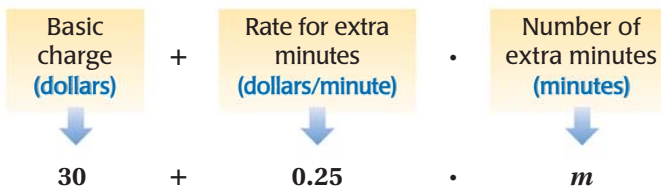


**Solution**

**STEP 1** Calculate the unit rate.

$$\frac{3.75}{15} = \frac{0.25}{1} = \$0.25 \text{ per minute}$$

**STEP 2** Write a verbal model and then an expression. Let  $m$  be the number of extra minutes.



Use *unit analysis* to check that the expression  $30 + 0.25m$  is reasonable.

$$\text{dollars} + \frac{\text{dollars}}{\text{minute}} \cdot \text{minutes} = \text{dollars} + \text{dollars} = \text{dollars}$$

Because the units are dollars, the expression is reasonable.

**STEP 3** Evaluate the expression when  $m = 22$ .

$$30 + 0.25(22) = 35.5$$

► The total bill is \$35.50.

**USE UNIT ANALYSIS**

You expect the answer, which is a cost, to be in dollars. You can use unit analysis to check that the expression produces an answer in dollars.



**GUIDED PRACTICE for Examples 4 and 5**

- Suppose your friends share cell phone service. They pay a basic charge of \$35 and \$8.80 for 40 extra minutes. Find their total bill if they use 35 extra minutes.