

**Reteaching with Practice**

For use with pages 160–165

**EXAMPLE 2** *Using a Table as a Check*

While on business, your mother drove 65 miles per hour in an automobile and traveled 260 miles per hour in an airplane. She drove twice as many hours as she flew and the total mileage for the trip was 780 miles. How many hours did she drive?

- Using the verbal model below, write and solve an algebraic equation.
- Make a table to check your solution.

$$\boxed{\text{Driving rate}} \cdot \boxed{\text{Driving time}} + \boxed{\text{Flying rate}} \cdot \boxed{\text{Flying time}} = \boxed{\text{Total distance}}$$

**SOLUTION**

- $65 \cdot 2x + 260 \cdot x = 780$  Write algebraic model.  
 $130x + 260x = 780$  Simplify.  
 $390x = 780$  Combine like terms.  
 $x = 2$  Divide each side by 390.

You find that  $x = 2$  hours flying time; therefore, she drove  $2x = 4$  hours.

b.

<i>Flying time, <math>x</math> (in hours)</i>	1	2	3	4
<i>Flying distance (in miles)</i>	260	520	780	1040
<i>Driving time, <math>2x</math> (in hours)</i>	2	4	6	8
<i>Driving distance (in miles)</i>	130	260	390	520
<i>Total distance (in miles)</i>	390	780	1170	1560

From the table you can see that the total distance is 780 miles when the driving time is  $2x = 4$  hours.

**Exercise for Example 2**

- Rework Example 2 if she drove three times as many hours as she flew and the total mileage for the trip was 1365 miles.

## Real-Life Application: When Will I Ever Use This?

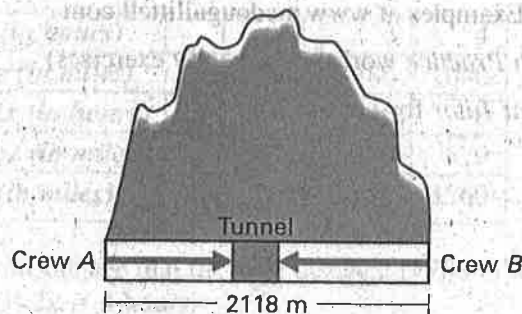
For use with pages 160–165

### Tunnels

A tunnel is a passage or roadway used for various purposes, including highway traffic, railroads, and subways. Although ancient civilizations used tunnels to carry water for irrigation or for drinking, the advent of the railroad and the motor vehicle marked a widespread expansion in the number and the length of tunnels.

Historically, tunnel building has been a long and dangerous endeavor, often claiming many lives in the process. Modern tunneling advancements, however, have not only increased the efficiency of construction, but have also greatly improved worker safety. Improved boring and drilling machines like the rock drill and the mole now allow a tunnel to be driven 4 or 5 times faster than with older techniques. In addition, lining tunnels with concrete or plastic sealers minimizes the danger of leaking water, which can cause delays, equipment damage, and even collapse.

Boring Brothers, Inc. has a contract to dig a tunnel through a mountain to accommodate the construction of a major highway. Crew A starts at the west end and digs at a rate of 9 meters per day. Crew B starts at the east end two days after Crew A and digs at a rate of 12 meters per day.



In Exercises 1–4, use the information above.

- Let  $x$  be the number of days Crew A has been digging. Write an expression for the number of meters Crew A has dug after  $x$  days.
- In terms of  $x$ , how many days has Crew B been digging? Write an expression for the number of meters Crew B has dug in this number of days.
- Write and solve an equation to find how many days it will take for both crews to dig the same number of meters.
- The total length of the tunnel is to be 2118 meters. Write an equation stating this fact. Then solve the equation to find how many days it takes to dig the tunnel from the time Crew A starts.