

**METHOD 2**

**Using a Table** Another approach is to make and use a table.

**STEP 1** Make a table that shows the height  $h$  (in feet) of the ball by substituting values for time  $t$  (in seconds) in the function  $h = -16t^2 + 45$ . Use increments of 1 second.

Time $t$ (seconds)	Height $h$ (feet)
0	45
1	29
2	-19

**STEP 2** Identify the time interval in which the height of the ball is 17 feet. This happens between 1 and 2 seconds.

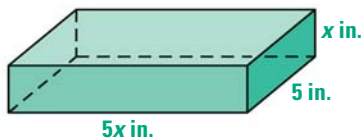
**STEP 3** Make a second table using increments of 0.1 second to get a closer approximation.

Time $t$ (seconds)	Height $h$ (feet)
1.0	29.00
1.1	25.64
1.2	21.96
<b>1.3</b>	<b>17.96</b>
1.4	13.64

▶ The ball is in the air about 1.3 seconds.

**PRACTICE**

- WHAT IF?** In the problem on page 659, suppose the ball is caught at a height of 10 feet. For how many seconds is the ball in the air? Solve this problem using two different methods.
- OPEN-ENDED** Describe a problem about a dropped object. Then solve the problem and explain what your solution means in this situation.
- GEOMETRY** The box below is a rectangular prism with the dimensions shown.
- TRAPEZE** You are learning how to perform on a trapeze. While hanging from a still trapeze bar, your shoe comes loose and falls to a safety net that is 6 feet off the ground. If your shoe falls from a height of 54 feet, how long does it take your shoe to hit the net? Choose any method for solving the problem. Show your steps.
- ERROR ANALYSIS** A student solved the problem in Exercise 4 as shown below. Describe and correct the error.



- Write an equation that gives the volume  $V$  (in cubic inches) of the box as a function of  $x$ .
- The volume of the box is 83 cubic inches. Find the dimensions of the box. Use factoring to solve the problem.
- Make a table to check your answer from part (b).

Let  $t$  be the time (in seconds) that the shoe is in the air.

$$6 = -16t^2 + 54$$

$$0 = -16t^2 + 60$$

Replace 60 with the closest perfect square, 64.

$$0 = -16t^2 + 64$$

$$0 = -16(t - 2)(t + 2)$$

$$t = 2 \text{ or } t = -2$$

It takes about 2 seconds.

