If we use the velocity at right-hand endpoints instead of left-hand endpoints, our estimate for the total distance becomes

$$f(t_1)\,\Delta t + f(t_2)\,\Delta t + \cdots + f(t_n)\,\Delta t = \sum_{i=1}^{n} f(t_i)\,\Delta t$$

The more frequently we measure the velocity, the more accurate our estimates become, so [redacted]

$$\boxed{5} \qquad d = \lim_{n\to\infty} \sum_{i=1}^{n} f(t_{i-1})\,\Delta t = \lim_{n\to\infty} \sum_{i=1}^{n} f(t_i)\,\Delta t$$

We will see in Section 5.4 that this is indeed true.

Because Equation 5 has the same form as our expressions for area in Equations 2 and 3, it follows that the distance traveled is equal to the area under the graph of the velocity function. In Chapters 6 and 8 we will see that other quantities of interest in the natural and [redacted]

[redacted]

(c) Improve your estimates in part (b) by using eight rectangles.

7–8 □ With a programmable calculator (or a computer), it is pos-

Use these data to estimate the height above Earth's surface of the space shuttle *Endeavour,* 62 seconds after liftoff.

13. The velocity graph of a braking car is shown. Use it to esti-

(b) The following formula for the sum of the cubes of the first

sum and then the limit in Example 3(a). Compare your answer