Example 1.1
Suppose that you drive the 10.0 km from your university to home in 20.0 min. Calculate your average speed (a) in kilometers per hour (km/h) and (b) in meters per second (m/s).

$$U \xrightarrow{\hspace{6cm}} H$$

$$\Delta X = 10.0 \text{ km}$$

$$t = 20.0 \text{ min} \quad [3 \text{ sig figs}]$$

Use Eq. 2.6: $\bar{V} = \dfrac{\Delta X}{t}$, $\bar{V} =$ average speed

$$\bar{V} = \frac{10}{20} = 0.5 \frac{km}{min}$$

(a) Unit conversion to $\dfrac{km}{hr}$. Use $1 \text{ hr} = 60 \text{ min}$

$$\bar{V} = 0.5 \frac{km}{min} \left(\frac{60 \ min}{1 \ hr} \right) = \frac{0.5 \times 60}{1}$$

$$= 30 \frac{km}{hr} = \boxed{30.0 \frac{km}{hr}}$$

(b) Unit conversion to m/s. Use $1000 \text{ m} = 1 \text{ km}$

$$60 \text{ s} = 1 \text{ min}$$

$$\bar{V} = 0.5 \frac{km}{min} \left(\frac{1 \ min}{60 \ s} \right) \left(\frac{1000 \ m}{1 \ km} \right)$$

$$= \frac{0.5 \times 1 \times 1000}{60 \times 1} = \frac{500}{60} = 8.33333 \ m/s$$

$$\boxed{\bar{V} = 8.33 \ m/s}$$