

Problem 70

(a) Suppose that a person has an average heart rate of 72.0 beats/min. How many beats does he or she have in 2.0 years? (b) In 2.00 years? (c) In 2.000 years?

Solution

Use conversion factors to obtain the number of beats, starting with the given times.

$$(a) \quad 2.0 \text{ years} \times \frac{365 \text{ days}}{1 \text{ year}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{72.0 \text{ beats}}{1 \text{ min}} \approx 7.6 \times 10^7 \text{ beats}$$

$$(b) \quad 2.00 \text{ years} \times \frac{365 \text{ days}}{1 \text{ year}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{72.0 \text{ beats}}{1 \text{ min}} \approx 7.57 \times 10^7 \text{ beats}$$

$$(c) \quad 2.000 \text{ years} \times \frac{365 \text{ days}}{1 \text{ year}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{72.0 \text{ beats}}{1 \text{ min}} \approx 7.57 \times 10^7 \text{ beats}$$

The answer is rounded to 2 significant figures in part (a) because there are only 2 significant figures in 2.0. The answer is rounded to 3 significant figures in part (c) because there are only 3 significant figures in 72.0.