

# Measurement & Unit Conversion

Use **unit analysis** to complete each conversion. Show your conversion factors and cancel units as you work. Give each answer with the same number of significant figures as the original measurement.

## 1. Basic SI Conversions

- a)  $350 \text{ cm} \rightarrow \text{m}$
- b)  $4.2 \text{ km} \rightarrow \text{m}$
- c)  $825 \text{ g} \rightarrow \text{kg}$
- d)  $75 \text{ mm} \rightarrow \text{m}$
- e)  $6.4 \text{ ms} \rightarrow \text{s}$

## 2. Common Physics Units

- a)  $2.5 \text{ kJ} \rightarrow \text{J}$
- b)  $0.85 \text{ kW} \rightarrow \text{W}$
- c)  $35 \text{ mA} \rightarrow \text{A}$
- d)  $4.7 \text{ k}\Omega \rightarrow \Omega$
- e)  $2.3 \text{ kHz} \rightarrow \text{Hz}$
- f)  $3.2 \text{ kN} \rightarrow \text{N}$

## 3. Converting Velocity

- a) Convert  $72 \text{ km/h}$  to  $\text{m/h}$ .
- b) Convert  $72\,000 \text{ m/h}$  to  $\text{m/min}$ .
- c) Convert  $1200 \text{ m/min}$  to  $\text{m/s}$ .
- d) Use unit analysis to convert  $72 \text{ km/h}$  directly to  $\text{m/s}$ .
- e) Convert  $108 \text{ km/h}$  to  $\text{m/s}$ .
- f) Convert  $8.0 \text{ m/s}$  to  $\text{m/min}$ .
- g) Convert  $480 \text{ m/min}$  to  $\text{m/h}$ .
- h) Convert  $28\,800 \text{ m/h}$  to  $\text{km/h}$ .
- i) Use unit analysis to convert  $8.0 \text{ m/s}$  directly to  $\text{km/h}$ .
- j) Which is faster:  $25 \text{ m/s}$  or  $110 \text{ km/h}$ ? Show a conversion to justify your answer.

## 4. Velocity Problems. Show your reasoning. Convert units where necessary before solving.

- a) A skateboarder travels at  $7.8 \text{ m/s}$  for  $12 \text{ s}$ . How far does the skateboarder travel?
- b) A snowboarder travels at  $56.1 \text{ m/s}$ . How long will it take to travel  $500 \text{ m}$ ?
- c) A roller coaster travels at  $64 \text{ km/h}$  for  $7.5 \text{ s}$ . How far does it travel in metres?
- d) A cyclist travels at  $18 \text{ km/h}$  for  $40 \text{ s}$ . How far does the cyclist travel in metres?
- e) A car travels  $350 \text{ m}$  at an average velocity of  $14 \text{ m/s}$ . How long does the trip take?
- f) A boat travels  $2.4 \text{ km}$  at an average velocity of  $8.0 \text{ m/s}$ . How long does the trip take in seconds?
- g) A runner travels  $100 \text{ m}$  in  $9.58 \text{ s}$ . What is the runner's average velocity in  $\text{m/s}$ ?
- h) A runner travels  $100 \text{ m}$  in  $9.58 \text{ s}$ . What is the runner's average velocity in  $\text{km/h}$ ?
- i) A vehicle travels at  $90 \text{ km/h}$ . How long will it take to travel  $750 \text{ m}$ ? Give your answer in seconds.