Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- the first significant figure is the 4, so keep two digits from there

$$\mathbf{0.0049}$$

2.2

- round each to 1 s.f.: $61.4 \to 60$ and $3.82 \to 4$

$$60 \times 4 = \mathbf{240}$$

2.3

- round each to 1 s.f.: $\dfrac{10 \times 4}{0.5}$

$$= \frac{40}{0.5} = \mathbf{80}$$

2.4

- the 4th significant figure is 9, so round the 4 up: $\mathbf{3.05}$

2.5

- $\sqrt{48.7} \approx \sqrt{50}$; use the nearby square $\sqrt{49} = 7$, and $2.1 \approx 2$
- $7 \times 2 = \mathbf{14}$

3.1

(a)

- round each to 1 s.f.: $\dfrac{20 \times 4}{0.5}$

$$= \frac{80}{0.5} = \mathbf{160}$$

(b)

- $\dfrac{18.6 \times 4.32}{0.51} = \dfrac{80.352}{0.51}$

$$= \mathbf{157.55}$$

- the estimate of 160 is within about 2% of this, so it was reasonable

3.2

(a)

- $8.3 \to 8$ and $5.7 \to 6$

$$8 \times 6 = \mathbf{48}\ \text{cm}^{\mathbf{2}}$$

(b)

- each length is correct to 0.05 cm, so the upper bounds are 8.35 cm and 5.75 cm

$$8.35 \times 5.75 = \mathbf{48.0125}\ \text{cm}^{\mathbf{2}}$$

3.3

- $\sqrt{99.2} \approx \sqrt{100} = 10$, $21.3 \approx 20$, $0.198 \approx 0.2$
- $\dfrac{10 + 20}{0.2} = \dfrac{30}{0.2}$
- $= \mathbf{150}$

3.4

(a)

- $487 \approx 500$ and $19.75 \approx 20$
- $500 \times 20 = \$\mathbf{10\,000}$

(b)

- **more**: both numbers were rounded **up**, so the estimate is too big (exact cost \$9618.25)