Solutions

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

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

2.1

- real distance $= 6 \times 50\,000 = 300\,000$ cm
- convert: $\div 100$ for metres, then $\div 1000$ for kilometres

$$= \mathbf{3} \text{ km}$$

2.2

- $70 < 180$, so add 180

$$= \mathbf{250}^\circ$$

2.3

- clockwise from north: east 090, south 180, west

$$= \mathbf{270}^\circ$$

2.4

- real distance $= 3.6$ km $= 360\,000$ cm
- map distance $= 360\,000 \div 20\,000 = \mathbf{18}$ cm

2.5

- $250^\circ - 180^\circ = \mathbf{070}^\circ$

3.1

(a)

- real length $= 18 \times 25 = 450$ cm

$$= \mathbf{4.5} \text{ m}$$

(b)

- 3 m $= 300$ cm, so the model is $300 \div 25$

$$= \mathbf{12} \text{ cm}$$

3.2

(a)

- $145 < 180$, so add 180

$$= \mathbf{325}^\circ$$

(b)

- C is due WEST of B, so standing at B and turning clockwise from north

$$= \mathbf{270}^\circ$$

- the position of A is not needed for this part – read which point you are standing on

3.3

- 1 km $= 100\,000$ cm, so the scale is $4 : 100\,000$
- divide by 4: $\mathbf{1} : \mathbf{25\,000}$

3.4

(a)

- the triangle ABC has a right angle at B: $AC = \sqrt{8^2 + 6^2} = \sqrt{100}$

$$AC = \mathbf{10} \text{ km}$$

(b)

- the bearing is measured clockwise from north at A; C is 8 km east and 6 km north of A
- $\tan\theta = \dfrac{\text{east}}{\text{north}} = \dfrac{8}{6}$, so $\theta = 53.1^\circ$
- bearing $= \mathbf{053}^\circ$

3.5

- lengths are multiplied by 2000, so areas are multiplied by $2000^2 = 4\,000\,000$
- real area $= 15 \times 4\,000\,000 = 60\,000\,000$ cm^2
- 1 m^2 $= 10\,000$ cm^2, so $60\,000\,000 \div 10\,000 = \mathbf{6000}$ m^2