

Solutions

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

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

2.1

- sine rule: $\frac{b}{\sin 65^\circ} = \frac{9}{\sin 40^\circ}$
- $b = \frac{9 \sin 65^\circ}{\sin 40^\circ}$
 $= 12.689 \dots = \mathbf{12.7 \text{ cm}}$

2.2

- cosine rule, since the angle lies between the two known sides
- $r^2 = 7^2 + 9^2 - 2(7)(9) \cos 52^\circ = 130 - 126 \cos 52^\circ$
- $r^2 = 52.43 \dots$
 $r = \mathbf{7.24 \text{ cm}}$
- take the square root at the very end, never of the separate terms

2.3

- area $= \frac{1}{2} \times 10 \times 14 \times \sin 38^\circ$
 $= 43.096 \dots = \mathbf{43.1 \text{ cm}^2}$

3.1

(a)

- the angle is between the two known sides, so use the cosine rule
- $AC^2 = 8^2 + 11^2 - 2(8)(11) \cos 73^\circ = 185 - 176 \cos 73^\circ$
- $AC^2 = 133.54 \dots$
 $AC = \mathbf{11.6 \text{ cm}}$

(b)

- area $= \frac{1}{2} \times 8 \times 11 \times \sin 73^\circ$
 $= 42.077 \dots = \mathbf{42.1 \text{ cm}^2}$

3.2

- sine rule: $\frac{\sin Y}{9.4} = \frac{\sin 35^\circ}{6.2}$
- $\sin Y = \frac{9.4 \sin 35^\circ}{6.2} = 0.8696 \dots$
 $Y = \mathbf{60.4^\circ}$
- the obtuse solution $180 - 60.4 = 119.6^\circ$ also has this sine; the question asked for the acute value