Area of non-right triangles

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Find the area when sides 10 cm and 12 cm include 30°. [2 marks]

$A = \frac{1}{2}(10)(12)\sin 30^\circ = 30$ cm².

Answer: 30 cm²

2. Sides 14 m and 9 m include 50°. Find the area to 0.1 m². [2 marks]

$A = \frac{1}{2}(14)(9)\sin 50^\circ$.

Answer: 48.3 m²

3. A triangle has area 15 cm². One side is 6 cm and another side b meets it at 30°. Find b. [3 marks]

$15 = \frac{1}{2}(6)b\sin 30^\circ = 1.5b$.

$b = 10$ cm.

Answer: 10 cm

4. Sides 5 cm and 10 cm enclose area 12.5 cm². Find both possible included angles. [3 marks]

$\sin C = \frac{12.5}{25} = \frac{1}{2}$.

The two angles between 0° and 180° are 30° and 150°.

Answer: 30° or 150°

5. Two sides of a triangular sign are 8 cm and 11 cm. Their included angle is acute and the area is 22 cm². Find that angle. [3 marks]

$\sin C = \frac{22}{44} = \frac{1}{2}$.

The acute answer is 30°.

Answer: 30°

6. $AB = 7$ cm, $AC = 9$ cm and angle $B = 40^\circ$. Explain why $\frac{1}{2} \times 7 \times 9 \times \sin 40^\circ$ is not justified. [2 marks]

The selected sides meet at A, so their included angle is A.

Find A before using those two sides in the area rule.

Answer: 40° is not the angle between AB and AC.