Sine rule

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. $A = 30^\circ$, $a = 6$ cm and $B = 45^\circ$. Find b exactly. [3 marks]

$b = \frac{6\sin 45^\circ}{\sin 30^\circ}$.

$b = \frac{6(\frac{\sqrt{2}}{2})}{\frac{1}{2}} = 6\sqrt{2}$ cm.

Answer: $6\sqrt{2}$ cm

2. $A = 50^\circ$, $a = 12$ cm and $B = 70^\circ$. Find b to 0.1 cm. [2 marks]

$b = \frac{12\sin 70^\circ}{\sin 50^\circ}$.

Answer: 14.7 cm

3. $B = 40^\circ$, $b = 9$ cm and $A = 55^\circ$. Find a to 0.1 cm. [2 marks]

$a = \frac{9\sin 55^\circ}{\sin 40^\circ}$.

Answer: 11.5 cm

4. $A = 35^\circ$, $a = 7$ cm and $b = 9$ cm. Find all possible B to 0.1°. [3 marks]

$\sin B = \frac{9\sin 35^\circ}{7}$.

Take inverse sine and its supplement.

Both have $A + B$ less than 180°.

Answer: 47.5° or 132.5°

5. Can $A = 40^\circ$, $a = 5$ cm and $b = 12$ cm form a triangle? Explain. [3 marks]

$\sin B = \frac{12\sin 40^\circ}{5} \approx 1.543$.

A real angle cannot have sine greater than 1.

Answer: No triangle exists.

6. $A = 70^\circ$, $B = 60^\circ$ and $a = 10$ m. Find C and c to 0.1 m. [3 marks]

$C = 180^\circ - 70^\circ - 60^\circ = 50^\circ$.

$c = \frac{10\sin 50^\circ}{\sin 70^\circ}$.

Answer: $C = 50^\circ$; $c = 8.2$ m