Sine rule

6 questions | 17 marks

Equivalent correct methods earn the corresponding marks.

1. $A = 50^\circ$, $B = 70^\circ$ and $a = 9\,\text{cm}$. Find b to one decimal place. [2 marks]

$b = \frac{9\sin 70^\circ}{\sin 50^\circ}$.

$b \approx 11.0\,\text{cm}$.

Answer: 11.0 cm

2. $A = 70^\circ$, $a = 20\,\text{cm}$ and $b = 15\,\text{cm}$. Find B to one decimal place and explain whether its supplement fits. [3 marks]

$\sin B = \frac{15\sin 70^\circ}{20}$.

The supplementary candidate plus $A = 70^\circ$ exceeds 180°.

Answer: 44.8°; the supplementary angle does not fit.

3. $A = 45^\circ$, $B = 60^\circ$ and $a = 10\,\text{m}$. Find C and c. [3 marks]

$C = 180^\circ - 45^\circ - 60^\circ = 75^\circ$.

$c = \frac{10\sin 75^\circ}{\sin 45^\circ}$.

Answer: $C = 75^\circ$; $c \approx 13.7\,\text{m}$

4. $A = 30^\circ$, $a = 10\,\text{cm}$ and $b = 14\,\text{cm}$. Find both B angles to one decimal place. [3 marks]

$\sin B = \frac{14 \sin 30^\circ}{10} = 0.7$.

Both inverse-sine and supplementary candidates leave a positive third angle.

Answer: 44.4° or 135.6°

5. $A = 50^\circ$, $a = 8\,\text{cm}$ and $b = 13\,\text{cm}$. Does a triangle exist? Explain. [3 marks]

$\sin B = \frac{13 \sin 50^\circ}{8} \approx 1.245 > 1$.

No angle can have this sine.

Answer: No triangle exists.

6. $A = 35^\circ$, $B = 85^\circ$ and $c = 18\,\text{m}$. Find a to one decimal place. [3 marks]

$C = 60^\circ$.

$a = \frac{18 \sin 35^\circ}{\sin 60^\circ}$.

Answer: 11.9 m