Sine rule

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. A = 30°, a = 6 cm and B = 45°. Find b exactly. [3 marks]

$b = 6\sin 45^\circ / \sin 30^\circ$.

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

Answer: $6\sqrt{2}$ cm

2. A = 50°, a = 12 cm and B = 70°. Find b to 0.1 cm. [2 marks]

$b = 12\sin 70^\circ / \sin 50^\circ$.

Answer: 14.7 cm

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

$a = 9\sin 55^\circ / \sin 40^\circ$.

Answer: 11.5 cm

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

$\sin B = 9\sin 35^\circ / 7$.

Take inverse sine and its supplement.

Both have A + B less than 180°.

Answer: 47.5° or 132.5°

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

$\sin B = 12\sin 40^\circ / 5 \approx 1.543$.

A real angle cannot have sine greater than 1.

Answer: No triangle exists.

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

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

$c = 10\sin 50^\circ / \sin 70^\circ$.

Answer: C = 50°; c = 8.2 m