Cambridge International AS & A Level

Mathematics 9709

Paper 1 Pure Mathematics 1

Topic 5-Trigonometry

Question No (7)

Question No (7)

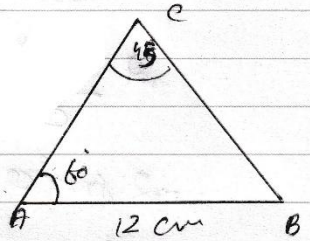
In the triangle ABC, $AB = 12\,\text{cm}$, angle $BAC = 60^\circ$ and angle $ACB = 45^\circ$. Find the exact length of BC.

Solution

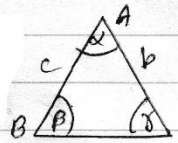
On Next page

In a triangle ABC

$AB = 12$ cm , $B\hat{A}C = 60°$, $A\hat{C}B = 45°$



Sine law



$$\frac{a}{\sin\alpha} = \frac{b}{\sin\beta} = \frac{c}{\sin\gamma}$$

By using the sine law

$$\frac{BC}{\sin 60} = \frac{12}{\sin 45}$$

$$BC = \frac{12}{\sin 45} \times \sin 60$$

$$= \frac{12}{\frac{1}{\sqrt{2}}} \times \frac{\sqrt{3}}{2}$$

$$= \frac{6}{1/\sqrt{2}} \times \sqrt{3}$$

$$= 6\sqrt{2} \times \sqrt{3}$$

$$BC = 6\sqrt{6}$$