Exercise 2

Paper 2 style · Graphic display calculator

2 6 marks SL 3.5 ●●● Demanding

In a triangle ABC, $AB = 12$ cm, $AC = 9$ cm and $A\hat{B}C = 45°$.

(a) Find the two possible values of $A\hat{C}B$. **[4]**

(b) Find the smaller of the two possible areas of the triangle ABC. **[2]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

$\frac{\sin C}{12} = \frac{\sin 45°}{9}$ **M1**

$A\hat{C}B = 70.5°$ $(70.5287\ldots)$ **A1**

$180° - 70.528\ldots$ **M1**

$A\hat{C}B = 109°$ $(109.471\ldots)$ **A1**

Total 4 marks

Note The second angle with the same sine.

MARKSCHEME (b)

$B\hat{A}C = 180° - 45° - 109.471\ldots° = 25.5287\ldots°$, $\frac{1}{2} \times 12 \times 9 \sin 25.528\ldots°$ **(M1)**

$23.3\ \text{cm}^2$ $(23.2720\ldots)$ **A1**

Total 2 marks

Note The smaller area comes with the obtuse C.