MEMORANDUM

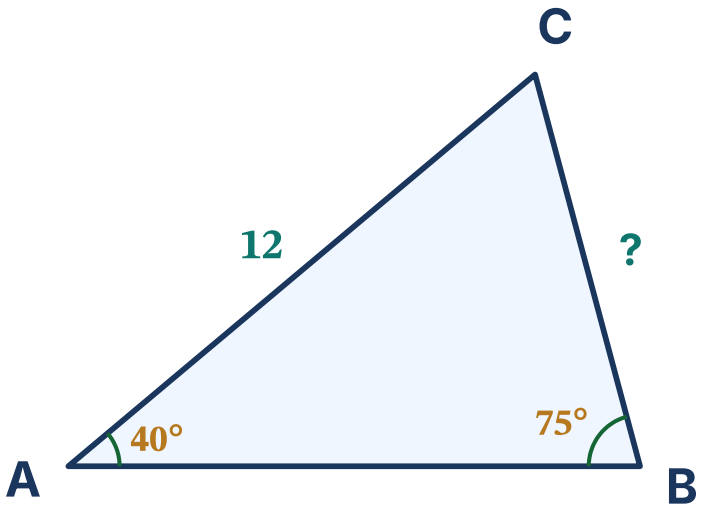
Name: ..... Class: .....

Date: .....

MARK ____ / 27

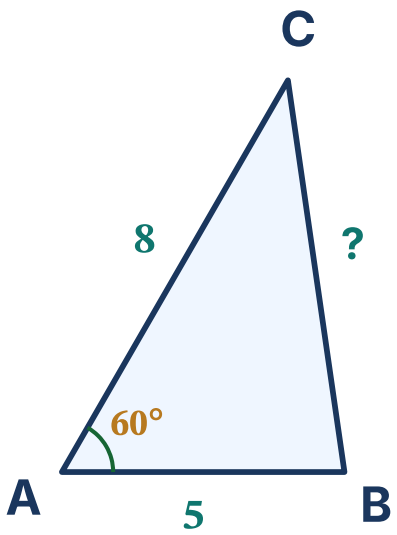
Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

1 In △ABC, $\hat{A} = 40°$, $\hat{B} = 75°$ and AC = 12 units. Calculate the length of BC. (3)



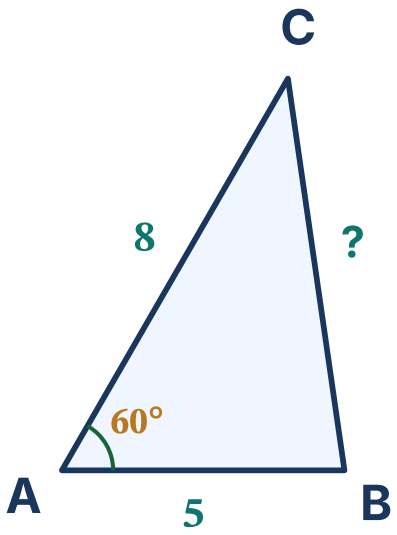
$$\frac{BC}{\sin 40°} = \frac{12}{\sin 75°} \rightarrow BC = \mathbf{7{,}99\ units}$$ ✓✓✓ (3)

2 In $\triangle ABC$, $AC = 8$ units, $AB = 5$ units and $\hat{A} = 60°$. Calculate the length of BC. (3)



$BC^2 = 64 + 25 - 80\cos 60° = 49 \rightarrow BC = 7$ **units** ✓✓✓ (3)

3 Calculate the area of $\triangle ABC$ if $AC = 8$ units, $AB = 5$ units and $\hat{A} = 60°$. (2)



$\frac{1}{2}(8)(5)\sin 60° =$ **17,32 square units** ✓✓ (2)

4 Which rule would you use given three sides and no angles? (1)

The **cosine rule**, rearranged as $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$ ✓ (1)

5 Which rule would you use given two angles and one side? (1)

The **sine rule** ✓ (1)

6 Write down the area rule for △PQR using sides p and q. (1)

> **Area** $= \frac{1}{2} \cdot pq \cdot \sin R$ ✓ (1)

7 In △ABC, $a = 7$, $b = 8$, $c = 5$. Calculate Â to one decimal. (3)

> $\cos A = \frac{64 + 25 - 49}{2(8)(5)} = \frac{40}{80} = 0{,}5 \rightarrow$ **Â = 60,0°** ✓✓✓ (3)

8 Why can SOHCAHTOA not be used in △ABC above? (2)

> **It is not right-angled** — SOHCAHTOA is only defined for right-angled triangles. ✓✓ (2)

9 Prove that the area of △ABC = ½ab sin C. (4)

> Draw AD ⊥ BC, AD = h ✓; area = ½ × a × h ✓; in △ADC, sin C = $\frac{h}{b}$ so $h = b$ sin C ✓; ∴ area = ½ab sin C ✓ (4)

10 Prove the sine rule for △ABC. (5)

> Draw CD ⊥ AB, CD = h ✓; in △ACD, $h = b$ sin A ✓; in △BCD, $h = a$ sin B ✓; ∴ b sin A = a sin B ✓; dividing by sin A sin B gives $\frac{a}{\sin A} = \frac{b}{\sin B}$ ✓ (5)

11 What single construction begins the proof of all three rules? (2)

> Drop a perpendicular from one vertex to the opposite side ✓, creating two right-angled triangles ✓ (2)

TOTAL: 27 marks

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