Question 5 (25 marks)

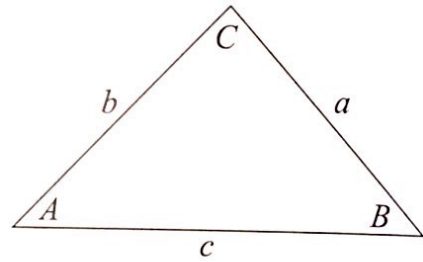**Question 5 (a)**

$$\text{Area} = \tfrac{1}{2}bc\sin\angle A = \tfrac{1}{2}ac\sin\angle B = \tfrac{1}{2}ab\sin\angle C$$

$$bc\sin\angle A = ac\sin\angle B = ab\sin\angle C \quad [\text{Divide across by } abc.]$$

$$\frac{\sin\angle A}{a} = \frac{\sin\angle B}{b} = \frac{\sin\angle C}{c}$$

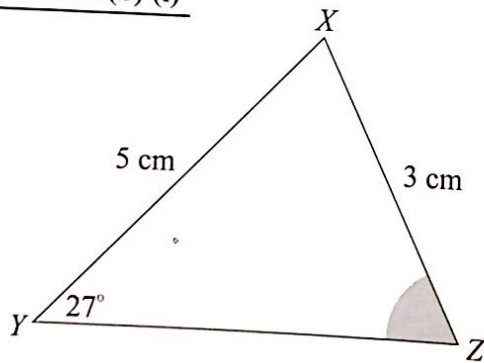$$\therefore \frac{a}{\sin\angle A} = \frac{b}{\sin\angle B} = \frac{c}{\sin\angle C}$$

Marking Scheme Notes

Question 5 (a) [Scale 5C (0, 3, 4, 5)]

3: • Relevant diagram
• One statement of area in trigonometric format
• Sine of a relevant angle in right angled triangle written in terms of sides
• Any reasonable step

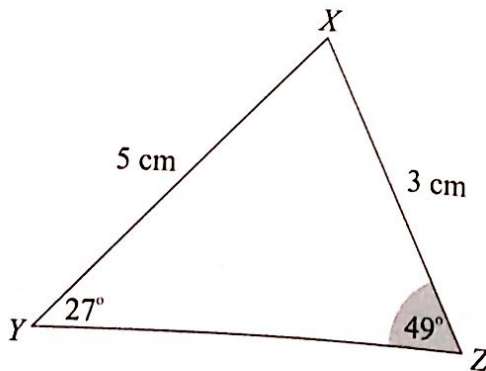4: • Correct approach but one error in work

Question 5 (b) (i)

$$\frac{\sin|\angle XZY|}{5} = \frac{\sin 27^\circ}{3}$$
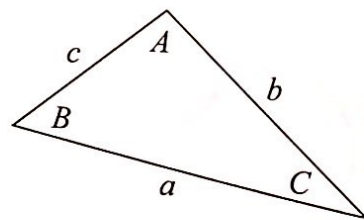
$$\sin|\angle XZY| = \frac{5\sin 27^\circ}{3}$$

$$|\angle XZY| = \sin^{-1}\left(\frac{5\sin 27^\circ}{3}\right) = 49^\circ \ [\text{First quadrant}]$$

$$|\angle XZY| = 180^\circ - 49^\circ = 131^\circ \ [\text{Second quadrant}]$$

FORMULAE AND TABLES BOOK
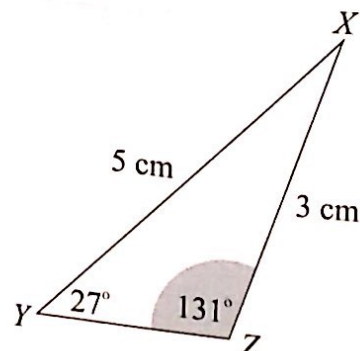**Trigonometry of the triangle:**
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Area: $\tfrac{1}{2}ab\sin C$

Sine Rule: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$

Question 5 (b) (ii)

MARKING SCHEME NOTES
Question 5 (b) (i) [Scale 10C* (0, 3, 8, 10)]
3: • Relevant formula
    • Any reasonable step
8: • Error in substitution into formula but continues
    • One value only
    • Correct method but one error in work

Question 5 (b) (ii) [Scale 5B (0, 3, 5)]
3: • One position only shown
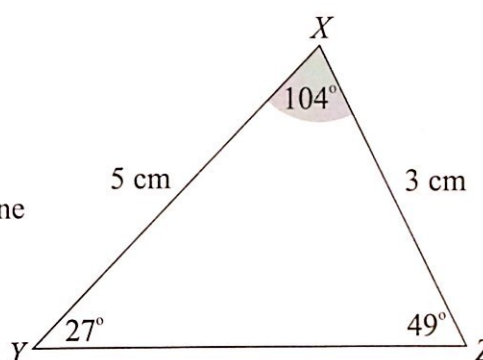   • Triangle(s) sketched but Z not indicated

Question 5 (c)

$|\angle YXZ| = 180° - 27° - 49° = 104°$

$$\boxed{\text{Area} = \tfrac{1}{2}\,ab\sin C}$$

The area of a triangle is the product of two sides by the sine of the included angle.

Area $= \tfrac{1}{2}(3)(5)\sin 104° = 7\cdot3 \text{ cm}^2 \approx 7 \text{ cm}^2$

MARKING SCHEME NOTES
Question 5 (b) (ii) [Scale 5B* (0, 3, 5)]
3: • $|\angle ZXY|$ only
    • Error in substitution into area formula
    • Any reasonable step

QUESTION 6A (25 MARKS)

Question 6A (a)

(i) The circumcentre of a triangle is the point of intersection of *the perpendicular bisectors of the sides of the triangle.*

(ii) The incentre of a triangle is the point of intersection of *the bisectors of the angles of the triangle.*

(iii) The centroid of a triangle is the point of intersection of *the medians of the triangle.*

MARKING SCHEME NOTES
Question 6A (a) [Scale 10D (0, 3, 7, 9, 10)]
3: • One partially correct statement
    • One partially correct sketch
    • Any reasonable step
7: • One fully correct statement
    • One fully correct sketch
9: • Two correct statements
    • Two correct sketches