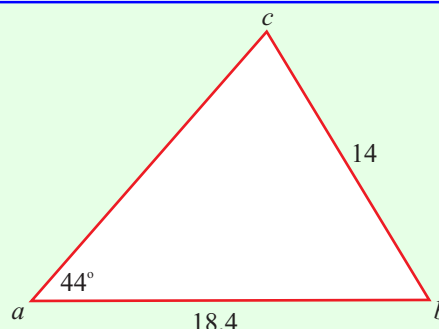


## TRIGONOMETRY (Q 5, PAPER 2)

### LESSON NO. 4: SINE RULE

**2006**5 (b) In the triangle  $abc$ ,

$$|ab| = 18.4, |bc| = 14 \text{ and } |\angle cab| = 44^\circ.$$

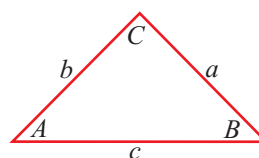
(i) Find  $|\angle bca|$ , correct to the nearest degree.(ii) Find the area of the triangle  $abc$ , correct to the nearest whole number.**SOLUTION****5 (b) (i)****SINE RULE FORMULA**

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \dots\dots \textcircled{9} \quad \text{OR} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \dots\dots \textcircled{9}$$

You use the Sine Rule when you are given:

[A] Two angles and one side.

[B] Two sides and one non-included angle.

**REMEMBER IT AS:**

$$\frac{\sin(\text{Angle 1})}{\text{Opposite side}} = \frac{\sin(\text{Angle 2})}{\text{Opposite side}} \quad \text{OR} \quad \frac{\text{Opposite side}}{\sin(\text{Angle 1})} = \frac{\text{Opposite side}}{\sin(\text{Angle 2})}$$

$$\frac{\sin C}{c} = \frac{\sin A}{a} \Rightarrow \frac{\sin C}{18.4} = \frac{\sin 44^\circ}{14}$$

$$\Rightarrow \sin C = \frac{18.4 \sin 44^\circ}{14} = 0.913$$

$$\therefore C = |\angle bca| = \sin^{-1}(0.913) = 66^\circ$$

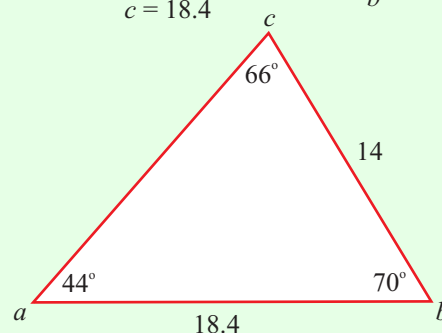
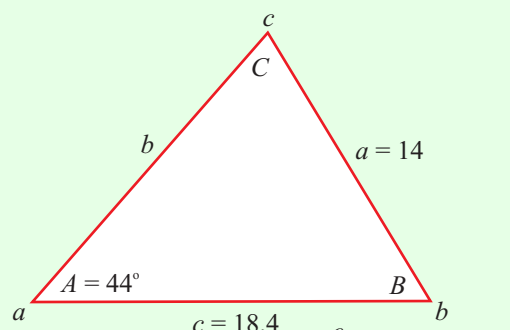
**5 (b) (ii)**The three angles in a triangle add up to  $180^\circ$ .

Find the third angle in the triangle.

$$|\angle abc| + 44^\circ + 66^\circ = 180^\circ$$

$$\Rightarrow |\angle abc| = 180^\circ - 44^\circ - 66^\circ$$

$$\therefore |\angle abc| = 70^\circ$$

**AREA OF A NON RIGHT-ANGLED TRIANGLE**

$$A = \frac{1}{2} ab \sin C \dots\dots \textcircled{6}$$

**REMEMBER IT AS:**

$$\text{Area} = \frac{1}{2} \times \text{Product of 2 sides} \times \text{Sine of the included angle}$$

$$A = \frac{1}{2} (14)(18.4) \sin 70^\circ = 121 \text{ square units}$$