

THINGS TO REMEMBER

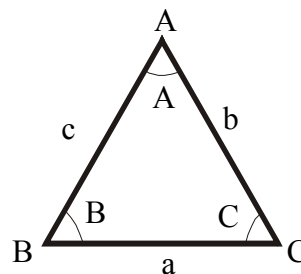
★ Relation between the Sides and Angles of Triangle :

In a $\triangle ABC$, angles are denoted by A , B and C the lengths of corresponding sides opposite to these angles are denoted by a , b and c respectively. Area and perimeter of a triangle are denoted by Δ and $2s$ respectively.

Also,

Semi-perimeter of the triangle is

$$s = \frac{a+b+c}{2}$$



Sine Rule

In any $\triangle ABC$, the sines of the angles are proportional to the lengths of the opposite side, ie,

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

It can also be written as

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = k \quad (\text{say})$$

then

$$a = k \sin A, b = k \sin B, c = k \sin C$$

Cosine Rule

In any $\triangle ABC$ cosine of an angle can express in terms of sides.

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos B = \frac{c^2 + a^2 - b^2}{2ac}$$

and

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

Projection Rule

In any $\triangle ABC$

$$a = b \cos C + c \cos B$$

$$b = a \cos C + c \cos A$$

$$c = a \cos B + b \cos A$$

Napier's Rule

In any $\triangle ABC$

$$\tan \frac{C-A}{2} = \frac{c-a}{c+a} \cot \frac{B}{2}$$

$$\tan \frac{A-B}{2} = \frac{a-b}{a+b} \cot \frac{C}{2}$$