9th Standard-Maths

Heron's Formula

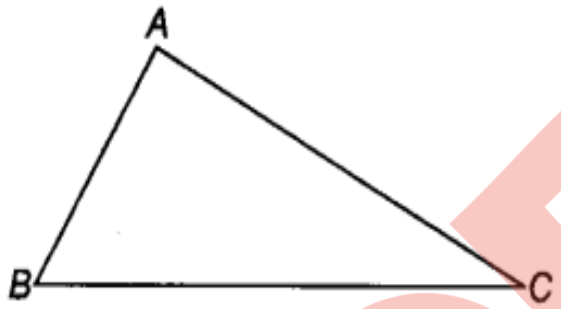
1. **Triangle:** A plane figure bounded by three line segments is called a triangle.

In ΔABC has

(i) three vertices, namely A, B and C.

(ii) three sides, namely AB, BC and CA.

(iii) three angles, namely ∠A, ∠B and ∠C.



2. Types of Triangle on the Basis of Sides

(i) **Equilateral triangle:** A triangle having all sides equal is called an equilateral triangle.

In equilateral ΔABC,

i.e., AB = BC = CA

(ii) **Isosceles triangle:** A triangle having two sides equal is called an isosceles triangle.

In isosceles ΔABC,

i.e., AB = AC

(iii) **Scalene triangle:** A triangle in which all the sides are of different lengths is called a scalene triangle.

In scalene ΔABC,

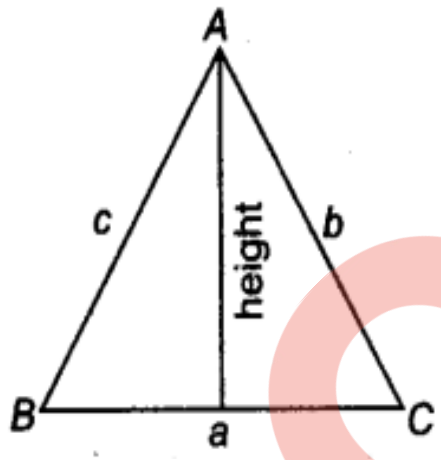
i.e., AB ≠ BC ≠ CA

3. **The perimeter of a Triangle:** The sum of the lengths of three sides of a triangle is called its perimeter.

Let, AB = c, BC = a, CA = b

i.e., Perimeter of ΔABC, 2s = a + b + c

4. **Area of a Triangle:** The measure of the surface enclosed by the boundary of the triangle is called its area.



Area of triangle = 12 × Base × Height

Area of right angled triangle = 12 × Base × Perpendicular

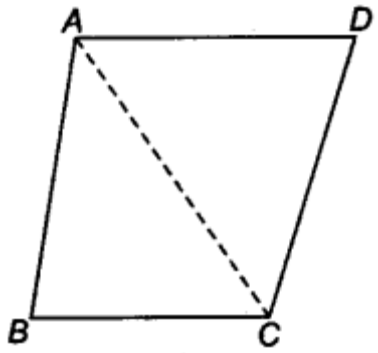
5. **Area of a Triangle (Heron's Formula):** If a triangle has a, b and c as sides, then the area of a triangle by Heron's formula

= s(s−a)(s−b)(s−c)−−−−−−−−−−−−−−−−−−√

where, s (semi-perimeter) = a+b+c2

Note: This formula is highly applicable in the case when we don't have the exact idea about height.

6. **Application of Heron's Formula in Finding Areas of Quadrilaterals:** Let ABCD he a quadrilateral to find the area of a quadrilateral we need to divide the quadrilateral in triangular parts.



Area of quadrilateral ABCD = Area of ΔABC + Area of ΔADC