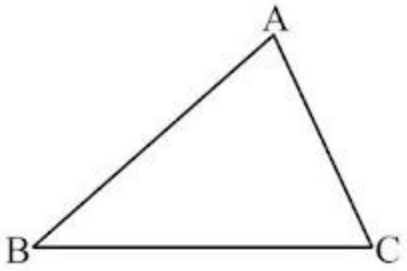
Chapter - 6

The Triangle and its Properties

• A triangle is a simple closed curve made of three line segments. It has three vertices, three sides and three angles.



Sides: $\overline{AB}$, $\overline{BC}$, $\overline{CA}$

Angles: ∠BAC, ∠ABC, ∠BCA

Vertices: A, B, C

Types of Triangles based on Sides

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

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

(iii) Scalene triangle: A triangle having all sides of different lengths is called a scalene triangle.

Types of Triangles based on Angles

(i) Acute triangle: A triangle each of whose angle measures less than 90° is

called an acute triangle.
(ii) Right angled triangle: A triangle one of whose angle measures 90° is called a right angled triangle.
(iii) Obtuse triangle: A triangle one of whose angle measures more than 90° is called an obtuse triangle.

• A median of a triangle connects a vertex of a triangle to the midpoint of the opposite side.

• An altitude of a triangle has one endpoint at a vertex of the triangle and the other on the line containing the opposite side. Through each vertex, an altitude can be drawn.

Properties of a Triangle

Property of Exterior Angles

• The measure of any exterior angle of a triangle is equal to the sum of the measures of its interior opposite angles.

Angle sum property

• The sum of three angles of a triangle is 180°.

Property of the Lengths of Sides of a Triangle

• The sum of the lengths of any two sides of a triangle is always greater than the length of the third side.

• The difference of the lengths of any two sides of a triangle is always smaller than the length of the third side.

Pythagoras Property

• In a right-angled triangle, the side opposite to the right angle is called the hypotenuse and the other two sides are called its legs or arms (base and perpendicular).

• In a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of its legs.