

Revision Notes

Chapter – 6

The Triangle and its Properties

- **Triangles:** A closed plane figure bounded by three line segments.
- The **six elements** of a triangle are its three angles and the three sides.
- The line segment joining a vertex of a triangle to the mid point of its opposite side is called a **median** of the triangle. A triangle has 3 medians.
- The perpendicular line segment from a vertex of a triangle to its opposite side is called an **altitude** of the triangle. A triangle has 3 altitudes.
- **Type of triangle based on Sides:**
- **Equilateral:** A triangle is said to be **equilateral**, if each one of its sides has the same length. In an equilateral triangle, each angle has measure 60° .
- **Isosceles:** A triangle is said to be **isosceles**, if atleast any two of its sides are of same length. The non-equal side of an isosceles triangle is called its base; the base angles of an isosceles triangle have equal measure.
- **Scalene:** A triangle having all side of different lengths. It has no two angles equal.
- **Property of the lengths of sides of a triangle:** The sum of the lengths of any two sides of a triangle is greater than the length of the third side.
- The difference between the lengths of any two sides is smaller than the length of the third side. This property is useful to know if it is possible to draw a triangle when the lengths of the three sides are known.
- **Types of Triangle based on Angles:**
 - (i) **Right Angled Triangle:** A triangle one of whose angles measures 90°
 - (ii) **Obtused Angled Triangle:** A triangle one of whose angles measures more than 90°
 - (iii) **Acute Angled Triangle:** A triangle each of whose angles measures less than 90°
- 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**.
- **Pythagoras property:** In a right-angled triangle, the square on the hypotenuse = the sum of the squares on its legs. If a triangle is not right-angled, this property does not hold good. This property is useful to decide whether a given triangle is right-angled

or not.

- An **exterior angle** of a triangle is formed, when a side of a triangle is produced. At each vertex, you have two ways of forming an exterior angle.
- **A 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.
- **The angle sum property of a triangle:** The total measure of the 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.

