Maths Class 9 Notes for Quadrilaterals

A quadrilateral is a closed figure obtained by joining four point (with no three points collinear) in an order.

Every quadrilateral has : (i) Four vertices, (ii) Four sides, (iii) Four angles and (iv) Two diagonals.

SUM OF THE ANGLES OF A QUADRILATERAL

Statement: The sum of the angles ofa quadrilateral is 360°

TYPES OF QUADRILATERALS

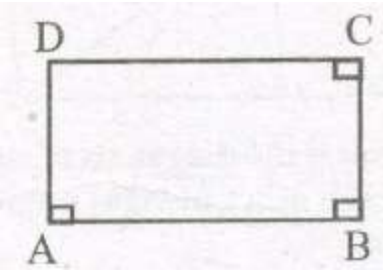
1. **Trapezium :** It is quadrilateral in which one pair of opposite sides are parallel.

2. **Parallelogram :** It is a quadrilateral in which both the pairs of opposite sides are parallel.

3. **Rectangle :** It is a quadrilateral whose each angle is 90°. ABCD is a rectangle.

(i) $\angle A + \angle B = 90° + 90° = 180° \Leftrightarrow AD \parallel BC$

(ii) $\angle B + \angle C = 900 + 900 = 180° \Leftrightarrow AB \parallel DC$



Rectangle ABCD is a parallelogram also.

4. **Rhombus :** It is a quadrilateral whose all the sides are equal.

5. **Square :** It is a quadrilateral whose all the sides are equal and each angle is 90°.

6. **Kite :** It is a quadrilateral in which two pairs of adjacent sides are equal.

Note :

- Square, rectangle and rhombus are all parallelograms.
- Kite and trapezium are not parallelograms.
- A square is a rectangle.
- A square is a rhombus.

- A parallelogram is a trapezium.

PARALLELOGRAM:

A parallelogram is a quadrilateral in which opposite sides are parallel. It is denoted by

PROPERTIES OF PARALLELOGRAM:

1. A diagonal of a parallelogram divides it into two congruent triangles.

2. The opposite sides of a parallelogram are equal.

Theorem : If each pair of opposite sides of a quadrilateral is equal, then it is a parallelogram.

3. The opposite angles of a parallelogram are equal.

Theorem : If in a quadrilateral, each pair of opposite angles is equal, then it is a parallelogram.

4. The diagonals of a parallelogram bisect each other.

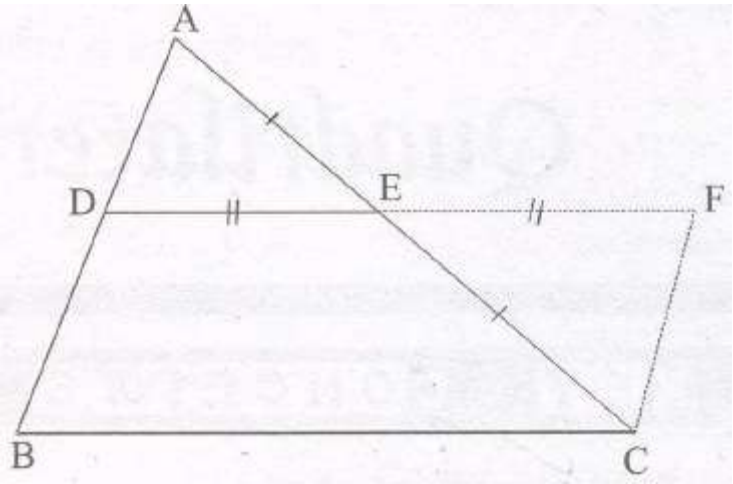
Theorem : If the diagonals of a quadrilateral bisect each other, then it is a parallelogram.

MID POINT THEOREM

(BASIC PROPORTIONALITY THEOREM)

Statement 1:

The line segment joining the mid-points of any two sides of a triangle is parallel to the third side



Statement 2:

The line drawn through the mid-point of one side of a triangle, parallel to another side bisects the third side.