

# QUADRILATERALS

Quadrilateral is a plane figure bounded by four straight lines.

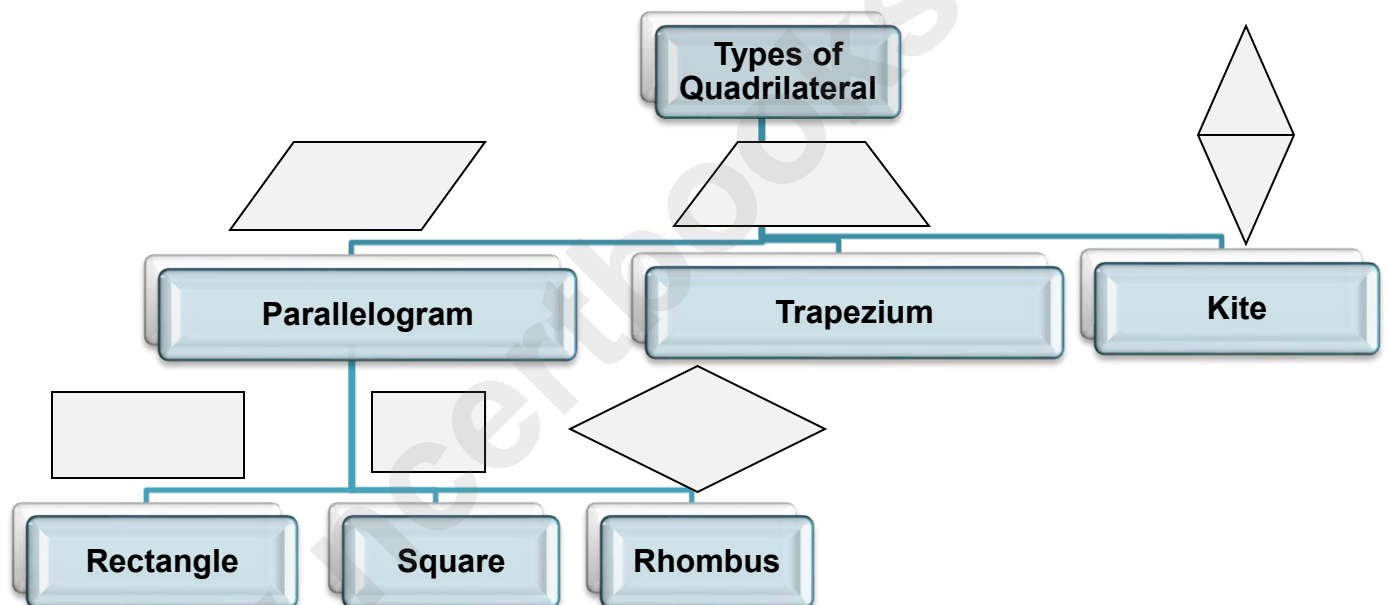
## “Properties of quadrilaterals”

Sum of four interior angles of a quadrilateral = 360 degrees

Its two diagonals intersect.

Line joining the mid points of any two adjacent sides is parallel to the coresponding diagonal

Lines joining the midpoints opf the sides of a quadrilateral in an order form paralellogram.



### PROPERTIES OF PARALLELOGRAM

- ❖ Opposite sides are equal and parallel.
- ❖ Opposite angles are equal.
- ❖ Diagonals bisect each other.
- ❖ The angles on the same side are supplementary
- ❖ Each diagonal bisect the parallelogram into two congruent triangles
- ❖ The angle bisectors of the opposite vertices are parallel
- ❖ The angle between angular bisectors of same side is a right angle

#### ➤ Properties of Rectangle:

- Diagonals are equal and bisect each other.
- The lines joining the midpoints of the sides in an order form a rhombus.
- Line joining the midpoints of opposite sides of a rectangle is parallel to either of sides
- Rectangle can be inscribed in a circle.

### PROPERTIES OF TRAPEZIUM

- ❖ Diagonals intersect each other
- ❖ Line joining the midpoints of non parallel sides is parallel to the parallel side and its length is half of the sum of parallel sides.
- ❖ **Isosceles trapezium has non parallel sides equal and it can be inscribed in a circle.**

### PROPERTIES OF KITE

**A kite is a quadrilateral which has two pair of adjacent sides equal.**

➤ **Properties of Square:**

- (i) Diagonals are equal and bisect at right angles.
- (ii) Diagonals bisect the opposite angles.
- (iii) Each diagonal divides the square into two congruent isosceles right angled triangles.
- (iv) It can be inscribed in a circle
- (v) A circle can be inscribed in a square touching all its sides.

➤ **Properties of Rhombus:**

- (i) All sides are equal
- (ii) Opposite angles are equal.
- (iii) Diagonals bisect each other perpendicularly.
- (iv) Diagonals are bisectors of the angles at the corresponding vertices.

**Theorem : If a pair of opposite sides of a quadrilateral are equal and parallel, it is a parallelogram**

**Theorem : In a parallelogram opposite sides are equal, opposite angles are equal and each diagonal bisects the parallelogram**

**Theorem : The diagonals of parallelogram bisect each other.**