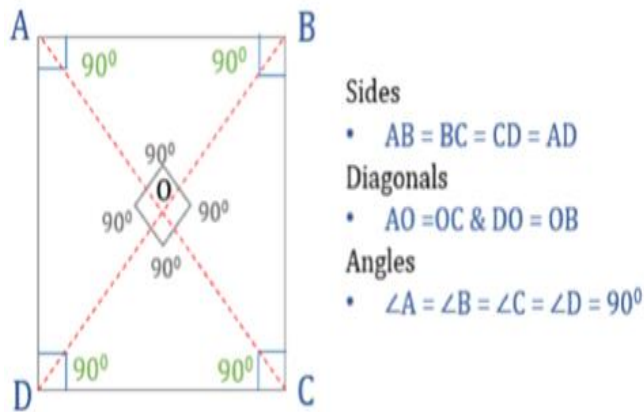# Quadrilaterals

A quadrilateral is a polygon with four sides, four angles and four vertices.

Properties of Square:

Sides:

- All four sides are equal.
- Opposite sides are parallel.

Angles:

- All four angles are right angles (90° each).
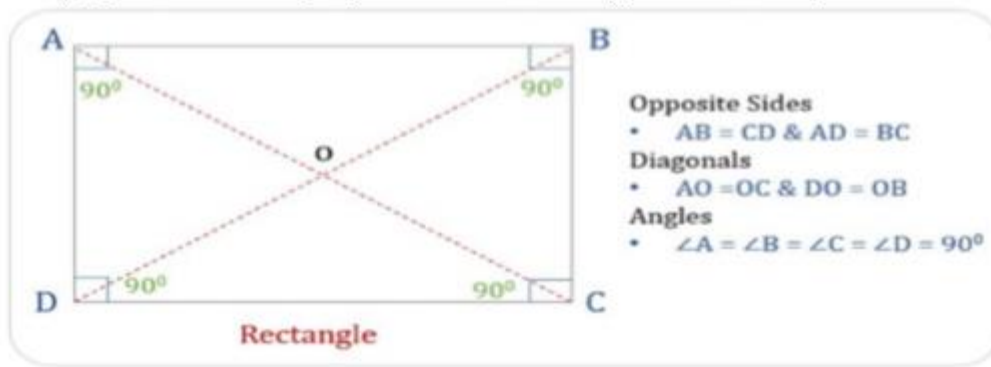- Sum of interior angles = 360°

Diagonals:

- Diagonals are equal in length.
- Diagonals bisect each other at right angles (90°).
- Diagonals bisect the angles of the square.

Symmetry:

- A square has 4 lines of symmetry.
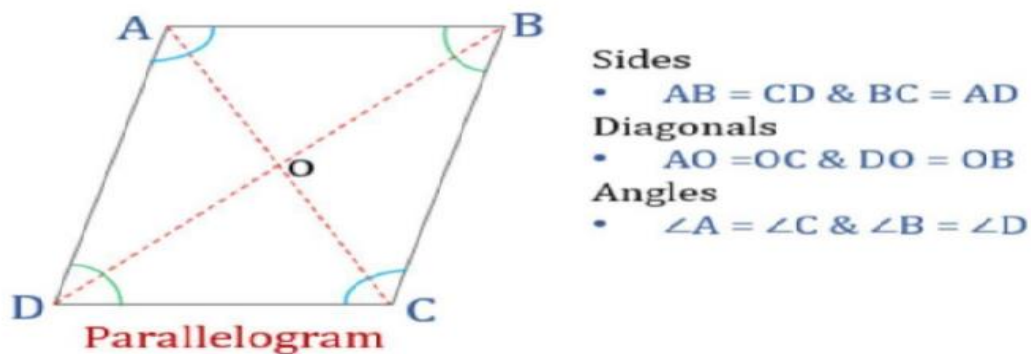- (can rotate 90°, 180°, 270°, 360° and remain the same).

Properties of Rectangle:

1) Opposite sides are equal in length and parallel.

2) All corner angles are 90°.

3) Diagonals bisect each other.

4) Diagonals are equal in length.

5) 4 isosceles triangles are formed due to diagonal bisection.

Rectangle

Opposite Sides
- AB = CD & AD = BC

Diagonals
- AO = OC & DO = OB

Angles
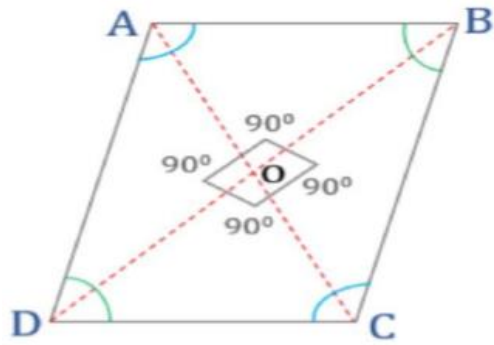- $\angle A = \angle B = \angle C = \angle D = 90^\circ$

Properties of Parallelogram

1. The opposite sides of a parallelogram are parallel.

2. The opposite angles of a parallelogram are equal.

3. The consecutive/adjacent angles of a parallelogram add up to 180° (co-interior)

4. Alternate angles are formed due to diagonals.

5. The two diagonals of a parallelogram divide the parallelogram into four triangles.

Parallelogram

Sides
- AB = CD & BC = AD

Diagonals
- AO = OC & DO = OB

Angles
- $\angle A = \angle C$ & $\angle B = \angle D$

Properties of Rhombus

1. All sides are equal and opposite sides are parallel.

2. Corner angles are unknown.

3. Opposite angles are equal.

4. Adjacent angles add up to 180°, as sides are parallel.

5. Diagonals bisect each other.

6. Diagonals bisect angles equally.

7. Diagonals meet each other at 90°.

8. Alternate angles are formed due to diagonals.
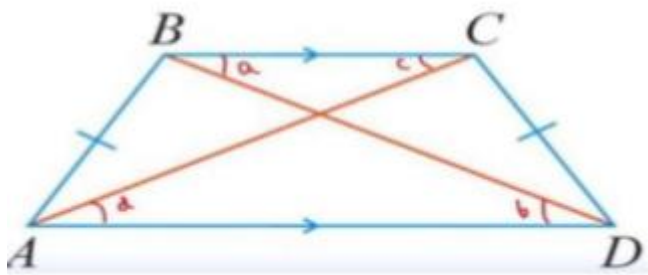
Sides
- AB = BC = CD = AD

Diagonals
- AO = OC & DO = OB

Angles
- ∠A = ∠C & ∠B = ∠D

Properties of Trapezium

1. One pair of opposite sides are parallel. (Short and long base)

2. Due to parallel lines co-interior angles are formed.

3. Alternate angles ∠a and ∠b, ∠c and ∠d are equal.

4. Isosceles trapezium base angles are equal

Properties of a kite:

1) Kite is the only quadrilateral with no parallel sides

2) Kite has two pairs of equal sides

3) Angles where two unequal sides meet are equal.

4) Horizontal diagonal (shorter diagonal) divides the kite into two isosceles triangles.

5) Vertical diagonal (longer diagonal) bisects the angles into two equal halves.

6) Diagonals bisect each other, and form centre angle each equal to 90°