

Understanding Quadrilaterals

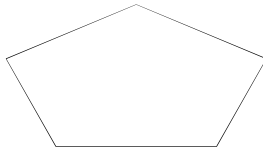
Polygons

A simple closed curve made up of only line segments is called a polygon.



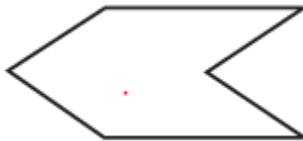
Convex Polygon

We have all the diagonals inside the Polygon



Concave Polygon

We don't have all the diagonals inside the Polygon



Regular and Irregular Polygons

A regular polygon is both 'equiangular' and 'equilateral'.

So all the sides and angles should be same

a) So square is a regular polygon but rectangle is not

b) Equilateral triangle is a regular polygon

Angle Sum in the Polygons

The Sum of the angles in the polygon is given by

$$=(n-2) \times 180^\circ$$

For Triangle, $n=3$

So Total = 180°

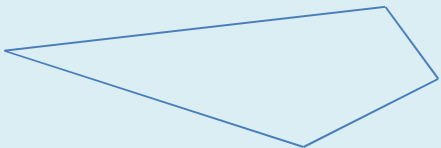
For quadrilateral, $n=4$

So total = 360°

Classification of polygons

We classify polygons according to the number of sides (or vertices)

Number of sides	Classification
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon

S.no	Terms	Descriptions
1	Quadrilateral	 A quadrilateral is a four-sided polygon with four angles. There are many kinds of quadrilaterals. The five most

common types are the parallelogram, the rectangle, the square, the trapezoid, and the rhombus.

2 Angle Property of Quadrilateral

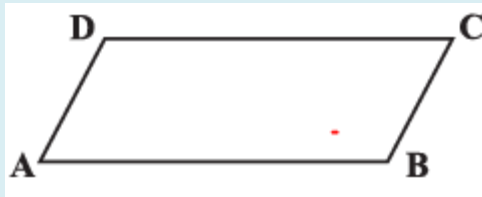
- 1) Sum of all the interior angles is 360°
- 2) Sum of all the exterior angles is 360°

3 Parallelogram

A quadrilateral which has both pairs of opposite sides parallel is called a parallelogram.

Its properties are:

- The opposite sides of a parallelogram are equal.
- The opposite angles of a parallelogram are equal.
- The diagonals of a parallelogram bisect each other.
- The adjacent angles in a parallelogram are supplementary.



4 Trapezium

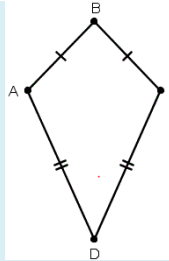
A quadrilateral which has one pair of opposite sides parallel is called a trapezium.



5 Kite

It is a quadrilaterals having exactly two distinct consecutive pairs of sides of equal length

Here ABCD is a Kite



$$AB=BC$$

$$AD=CD$$

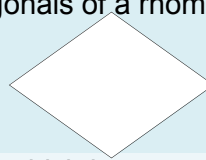
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Rhombus

Rhombus is a parallelogram in which any pair of adjacent sides is equal.

Properties of a rhombus:

- All sides of a rhombus are equal
- The opposite angles of a rhombus are equal
- The diagonals of a rhombus bisect each other at right angles.



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Rectangles

A parallelogram which has one of its angles a right angle is called a rectangle.

Properties of a rectangle are:

- The opposite sides of a rectangle are equal
- Each angle of a rectangle is a right-angle.
- The diagonals of a rectangle are equal.
- The diagonals of a rectangle bisect each other.



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Square

A quadrilateral, all of whose sides are equal and all of whose angles are right angles.

Properties of square are:

- All the sides of a square are equal.
- Each of the angles measures 90° .
- The diagonals of a square bisect each other at right angles.

The diagonals of a square are equal.