

O.P.JINDAL SCHOOL SAVITRI NAGAR

Class: IX

Worksheet (2020-21)

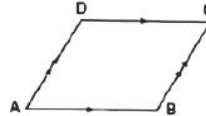
Subject: Maths

Topic: QUADRILATERALS

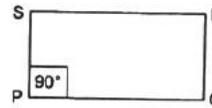
TYPES OF QUADRILATERALS

Various types of quadrilateral are:

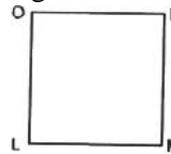
- (i) Parallelogram: A quadrilateral in which opposite sides are parallel and equal is called a parallelogram. In the figure, ABCD is a parallelogram. Here, $AB \parallel DC$, $AD \parallel BC$ and $AB = DC$, $AD = BC$



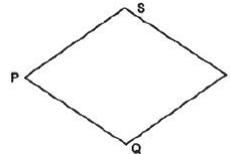
- (ii) Rectangle: A parallelogram, each of whose angles is 90° , is called a rectangle. In the figure, PQRS is a rectangle.



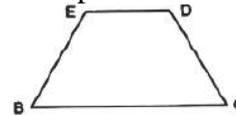
- (iii) Square: A parallelogram having all sides equal and each angle is of 90° is called a square. In the figure, LMNO is a square.



- (iv) Rhombus: A parallelogram having all sides equal is called a rhombus. In the figure, PQRS is a rhombus.

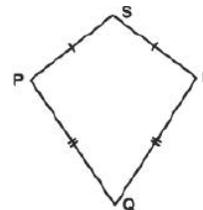


- (v) Trapezium: A quadrilateral in which two opposite sides are parallel and two opposite sides are non-parallel, is called a trapezium. In the figure, BCDE is a trapezium.



Note: If the two non-parallel sides of a trapezium are equal, then it is called an isosceles trapezium.

- (vi) Kite: A quadrilateral in which two pairs of adjacent sides are equal is known as kite. PQRS is a kite such that $PQ = QR$ and $PS = RS$.



Kite

- Note:** (i) A square, rectangle and rhombus are all parallelograms.
(ii) A square is a rectangle and also a rhombus, but a rectangle or a rhombus is not a square.
(iii) A parallelogram is a trapezium, but a trapezium is not a parallelogram.
(iv) A kite is not a parallelogram.

PROPERTIES OF A PARALLELOGRAM

1. A diagonal of a parallelogram, divides it into two congruent triangles.
2. In a parallelogram, opposite sides are parallel and equal.
3. In a parallelogram, opposite angles are equal.
4. The diagonals of a parallelogram bisect each other.

Examples1. The diagonals of which quadrilateral are equal and bisect each other at 90° ?
Solution: Square. The diagonals of a square are equal and bisect each other at 90° .

Example:2. Find all the angles of a parallelogram if one angle is 80° .

Solution: For a parallelogram ABCD, opposite angles are equal.

So, if $\angle A = \angle C = 80^\circ$ then,

$\angle A + \angle B + \angle C + \angle D = 360^\circ$ (the sum of angles of any quadrilateral = 360°).

Also, $\angle B = \angle D$

Thus, $80^\circ + \angle B + 80^\circ + \angle D = 360^\circ$

Or, $\angle B + \angle D = 200^\circ$

Hence, $\angle B = \angle D = 100^\circ$ ($\angle B = \angle D$, $2\angle B = 200$, $\angle B = 100$)

So, $\angle A = 80^\circ$, $\angle B = 100^\circ$, $\angle C = 80^\circ$, $\angle D = 100^\circ$

ASSIGNMENT

- Q1.** In a rectangle, one diagonal is inclined to one of its sides at 25° . Measure the acute angle between the two diagonals.
- Q2.** Is it possible to draw a quadrilateral whose all angles are obtuse angles?
- Q3.** In a trapezium ABCD, $AB \parallel CD$. Calculate $\angle C$ and $\angle D$ if $\angle A = 55^\circ$ and $\angle B = 70^\circ$.
- Q4.** Calculate all the angles of a parallelogram if one of its angles is twice its adjacent angle.
- Q5.** Calculate all the angles of a quadrilateral if they are in the ratio 2:5:4:1.

Note: This worksheet is prepared from home.

