

Chapter - 8

(Quadrilaterals)

Key Concept

- (1) Sum of the angles of a quadrilateral is 360° .
- (2) A diagonals of a parallelogram divides it into two congruent triangles.
- (3) In a parallelogram
 - (a) diagonals bisects each other.
 - (b) opposite angles are equal.
 - (c) opposite sides are equal
- (4) Diagonals of a square bisects each other at right angles and are equal, and vice-versa.
- (5) A line through the mid-point of a side of a triangle parallel to another side bisects the third side. (Mid point theorem)
- (6) The line through the mid points of sides of a Δ , \parallel to third side and half of it.

Section - A

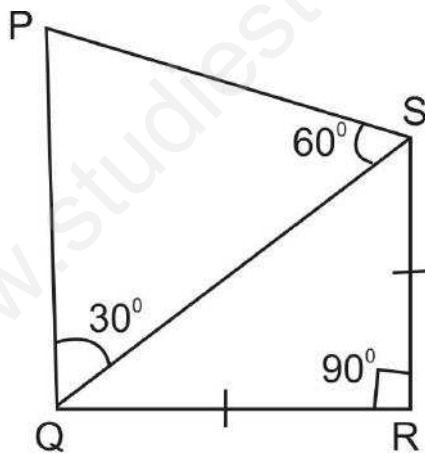
- Q.1 The figures obtained by joining the mid-points of the sides of a rhombus, taken in order, is
- (a) a square
 - (b) a rhombus
 - (c) a parallelogram
 - (d) a rectangle
- Q.2 The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O, if $\angle DAC = 32^\circ$ and $\angle AOB = 72^\circ$ then $\angle DBC$ is
- (a) 32°
 - (b) 24°
 - (c) 40°
 - (d) 63°
- Q.3 In a square ABCD, the diagonals AC and BD bisect at O. Then ΔAOB is
- (a) acute angled
 - (b) right angled
 - (c) obtuse angled
 - (d) equilateral

- Q.4 ABCD is a rhombus such that $\angle ACB = 40^\circ$ then $\angle ADB$ is
 (a) 40° (b) 45° (c) 50° (d) 60°
- Q.5 A quadrilateral ABCD is a parallelogram if
 (a) $AD \parallel BC$ (b) $AB = CD$
 (c) $AB = AD$ (d) $\angle A = 60^\circ, \angle C = 60^\circ, \angle B = 120^\circ$
- Q.6 Three angles of a quadrilateral are $60^\circ, 70^\circ$ and 80° . The fourth angle is
 (a) 150° (b) 160° (c) 140° (d) None of these

Section - B

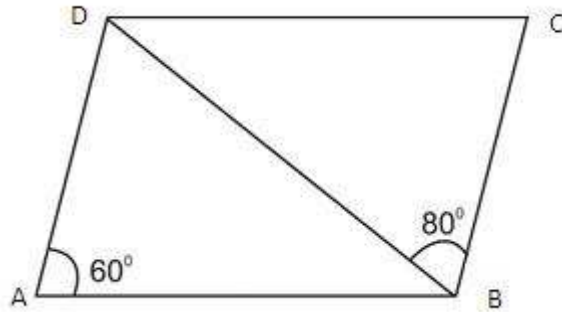
- Q.7 In the adjoining figure $QR = RS$

Find $\angle PSR$



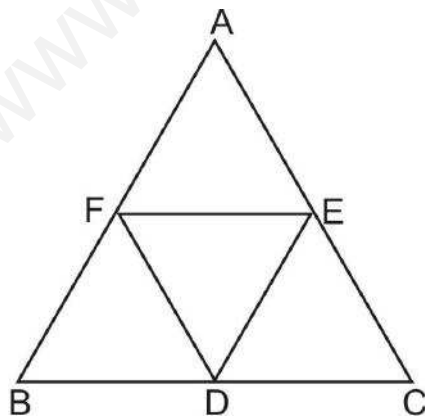
- Q.8 Prove that the sum of the four angles of a quadrilateral is 360° .
- Q.9 Prove that the diagonals of a parallelogram bisect each other.
- Q.10 The angles of quadrilateral are in the ratio $3 : 5 : 9 : 13$. Find all the angles of the quadrilateral.
- Q.11 ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that ABCD is a square.

- Q.12 In the adjoining figure, ABCD is a ||gm. If $\angle DAB = 60^\circ$ and $\angle DBC = 80^\circ$.
Find $\angle CDB$ and $\angle ADB$.



Section - C

- Q.13 Prove that the line segment joining the mid-points of two sides of a triangle is parallel to the third side.
- Q.14 ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.
- Q.15 Prove that the straight line joining the mid-points of the diagonals of a trapezium is parallel to the parallel sides and is equal to half their difference.
- Q.16 In the adjoining figure, D, E and F are mid-points of the sides BC, CA and AB of $\triangle ABC$. If $AB = 4.3\text{cm}$, $BC = 5.6\text{cm}$ and $AC = 3.5\text{cm}$, find the perimeter of $\triangle DEF$.



- Q.17 In a parallelogram ABCD, AP and CQ are drawn perpendiculars from vertices A and C on diagonal BD. Prove that $\triangle APB \cong \triangle CQD$.
- Q.18 In a parallelogram ABCD, E and F are points on AB and CD such that $AE = CF$.

Prove that $ED \parallel BF$.

Section - D

- Q.19 If a line is parallel to the base of a trapezium and bisects one of the non-parallel sides, then prove that it bisects either diagonal of the trapezium.
- Q.20 AD is a median of $\triangle ABC$ and E is the mid-point of AD. BE Produced meets AC in F. Prove that $AF = \frac{1}{3} AC$
- Q.21 ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that
- (i) D is the mid-point of AC
 - (ii) $CM = MA = \frac{1}{2} AB$
- Q.22 Show that the bisectors of angles of a parallelogram form a rectangle.

Answers -

- Q.1 (d) Rectangle
- Q.2 (c) 40°
- Q.3 (b) Right angled
- Q.4 (c) 50°
- Q.5 (d) $\angle A = 60^\circ$, $\angle C = 60^\circ$, $\angle B = 120^\circ$
- Q.6 (a) 150°
- Q. 7 $\angle PSR = 105^\circ$
