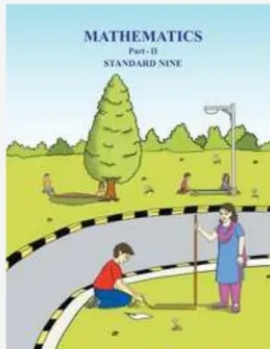


Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 5.3- Quadrilaterals

BOOK SOLUTIONS
CLASS 9
MATHS (PART 2)

CHAPTER 5.3
Quadrilaterals



Maharashtra Board Solutions→

For any clarifications or questions you can write to info@indcareer.com

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Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 5.3- Quadrilaterals

Maharashtra Board 9th Maths Chapter 5.3, Class 9 Maths Chapter 5.3 solutions

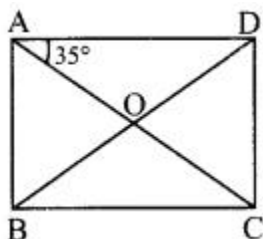
Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 5.3- Quadrilaterals

Maharashtra Board 9th Maths Chapter 5.3, Class 9 Maths Chapter 5.3 solutions

Question 1.

Diagonals of a rectangle ABCD intersect at point O. If $AC = 8$ cm, then find BO and if $\angle CAD = 35^\circ$, then find $\angle ACB$.

Solution:



i. $AC = 8$ cm ...(i) [Given]

□ABCD is a rectangle [Given]

$\therefore BD = AC$ [Diagonals of a rectangle are congruent]

$\therefore BD = 8$ cm [From (i)]

$BO = \frac{1}{2} BD$ [Diagonals of a rectangle bisect each other]

$\therefore BO = \frac{1}{2} \times 8$

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$$\therefore BO = 4 \text{ cm}$$

ii. side AD $\parallel$ side BC and seg AC is their transversal. [Opposite sides of a rectangle are parallel]

$$\therefore \angle ACB = \angle CAD \text{ [Alternate angles]}$$

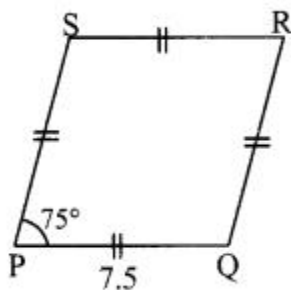
$$\angle ACB = 35^\circ \text{ [} \because \angle CAD = 35^\circ \text{]}$$

$$\therefore BO = 4 \text{ cm, } \angle ACB = 35^\circ$$

Question 2.

In a rhombus PQRS, if PQ = 7.5 cm, then find QR. If $\angle QPS = 75^\circ$, then find the measures of $\angle PQR$ and $\angle SRQ$.

Solution:



i. $PQ = 7.5 \text{ cm}$ [Given]

□PQRS is a rhombus. [Given]

$$\therefore QR = PQ \text{ [Sides of a rhombus are congruent]}$$

$$\therefore QR = 7.5 \text{ cm}$$

ii. $\angle QPS = 75^\circ$ [Given]

$$\angle QPS + \angle PQR = 180^\circ \text{ [Adjacent angles of a rhombus are supplementary]}$$

$$\therefore 75^\circ + \angle PQR = 180^\circ$$

$$\therefore \angle PQR = 180^\circ - 75^\circ$$

$$\therefore \angle PQR = 105^\circ$$

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iii. $\angle SRQ = \angle QPS$ [Opposite angles of a rhombus]

$$\therefore \angle SRQ = 75^\circ$$

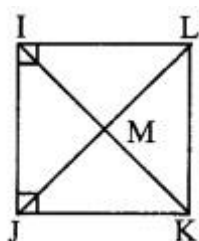
$$\therefore QR = 7.5 \text{ cm}, \angle PQR = 105^\circ,$$

$$\angle SRQ = 75^\circ$$

Question 3.

Diagonals of a square IJKL intersect at point M. Find the measures of $\angle IMJ$, $\angle JIK$ and $\angle LJK$.

Solution:



□ IJKL is a square. [Given]

$\therefore \text{seg IK} \perp \text{seg JL}$ [Diagonals of a square are perpendicular to each other]

$$\angle IMJ = 90^\circ$$

$$\angle JIL = 90^\circ \dots\dots (i) \text{ [Angle of a square]}$$

ii. $\angle JIK = \frac{1}{2} \angle JIL$ [Diagonals of a square bisect the opposite angles]

$$\angle JIK = \frac{1}{2} (90^\circ) \text{ [From (i)]}$$

$$\therefore \angle JIK = 45^\circ$$

$$\angle IJK = 90^\circ (ii) \text{ [Angle of a square]}$$

iii. $\angle LJK = \frac{1}{2} \angle IJK$ [Diagonals of a square bisect the opposite angles]

$$\angle LJK = \frac{1}{2} (90^\circ) \text{ [From (ii)]}$$

$$\therefore \angle LJK = 45^\circ$$

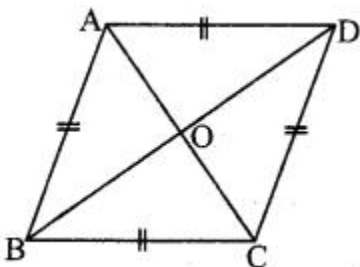
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$$\therefore \angle LJK = 90^\circ, \angle JIK = 45^\circ, \angle LJK = 45^\circ$$

Question 4.

Diagonals of a rhombus are 20 cm and 21 cm respectively, then find the side of rhombus and its Perimeter.

Solution:



i. Let $\square ABCD$ be the rhombus.

$$AC = 20 \text{ cm}, BD = 21 \text{ cm}$$

$$\begin{aligned} AO &= \frac{1}{2} AC \quad [\text{Diagonals of a rhombus bisect each other}] \\ &= \frac{1}{2} \times 20 = 10 \text{ cm} \quad (\text{i}) \end{aligned}$$

$$\begin{aligned} \text{Also, } BO &= \frac{1}{2} BD \quad [\text{Diagonals of a rhombus bisect each other}] \\ &= \frac{1}{2} \times 21 = \frac{21}{2} \text{ cm} \quad (\text{ii}) \end{aligned}$$

ii. In $\triangle AOB$, $\angle AOB = 90^\circ$ [Diagonals of a rhombus are perpendicular to each other]

$$\therefore AB^2 = AO^2 + BO^2 \quad [\text{Pythagoras theorem}]$$

$$= (10)^2 + \left(\frac{21}{2}\right)^2 \quad [\text{From (i) and (ii)}]$$

$$= 100 + \frac{441}{4}$$

$$= \frac{400 + 441}{4}$$

$$\therefore AB^2 = \frac{841}{4}$$

$$\therefore AB = \sqrt{\frac{841}{4}} \quad [\text{Taking square root of both sides}]$$

$$= \frac{29}{2} = 14.5 \text{ cm}$$

iii. Perimeter of $\square ABCD$

$$= 4 \times AB = 4 \times 14.5 = 58 \text{ cm}$$

$\therefore$ The side and perimeter of the rhombus are 14.5 cm and 58 cm respectively.

Question 5.

State with reasons whether the following statements are 'true' or 'false'.

- i. Every parallelogram is a rhombus.
- ii. Every rhombus is a rectangle,
- iii. Every rectangle is a parallelogram.
- iv. Every square is a rectangle,
- v. Every square is a rhombus.
- vi. Every parallelogram is a rectangle.

Answer:

- i. False.

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All the sides of a rhombus are congruent, while the opposite sides of a parallelogram are congruent.

ii. False.

All the angles of a rectangle are congruent, while the opposite angles of a rhombus are congruent.

iii. True.

The opposite sides of a parallelogram are parallel and congruent. Also, its opposite angles are congruent.

The opposite sides of a rectangle are parallel and congruent. Also, all its angles are congruent.

iv. True.

The opposite sides of a rectangle are parallel and congruent. Also, all its angles are congruent.

All the sides of a square are parallel and congruent. Also, all its angles are congruent.

v. True.

All the sides of a rhombus are congruent. Also, its diagonals are perpendicular bisectors of each other.

All the sides of a square are congruent. Also, its diagonals are perpendicular bisectors of each other.

vi. False.

All the angles of a rectangle are congruent, while the opposite angles of a parallelogram are congruent.



Maharashtra Board Solutions

Class 9 Maths

Part 2

- Chapter 1.1- Basic Concepts in Geometry
- Chapter 1.2- Basic Concepts in Geometry
- Chapter 1.3- Basic Concepts in Geometry
- Chapter 2.1- Parallel Lines
- Chapter 2.2- Parallel Lines
- Chapter 3.1- Triangles
- Chapter 3.2- Triangles
- Chapter 3.3- Triangles
- Chapter 3.4- Triangles
- Chapter 3.5- Triangles
- Chapter 4.1- Constructions of Triangles
- Chapter 4.2- Constructions of Triangles
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- Chapter 5.4- Quadrilaterals
- Chapter 5.5- Quadrilaterals
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- Chapter 9.1- Surface Area and Volume
- Chapter 9.2- Surface Area and Volume
- Chapter 9.3- Surface Area and Volume

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The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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FAQs

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The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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