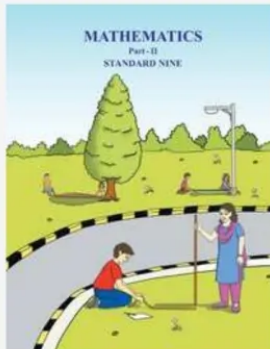


Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 5.5- Quadrilaterals

BOOK SOLUTIONS
CLASS 9
MATHS (PART 2)

CHAPTER 5.5
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 5.5- Quadrilaterals

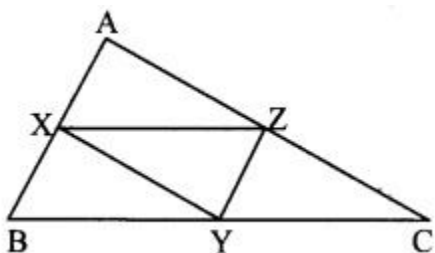
Class 9: Maths Chapter 5.5 solutions. Complete Class 9 Maths Chapter 5.5 Notes.

Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 5.5- Quadrilaterals

Maharashtra Board 9th Maths Chapter 5.5, Class 9 Maths Chapter 5.5 solutions

Question 1.

In the adjoining figure, points X, Y, Z are the midpoints of $\triangle ABC$ respectively, cm. Find the lengths of side AB, side BC and side AC $AB = 5$ cm, $AC = 9$ cm and $BC = 11$ cm. Find the lengths of XY, YZ, XZ.



Solution:

i. $AC = 9$ cm [Given]

Points X and Y are the midpoints of sides AB and BC respectively. [Given]

$\therefore XY = \frac{1}{2} AC$ [Midpoint theorem]

$$= \frac{1}{2} \times 9 = 4.5 \text{ cm}$$

ii. $AB = 5$ cm [Given]

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Points Y and Z are the midpoints of sides BC and AC respectively. [Given]

$$\therefore YZ = \frac{1}{2} AB \text{ [Midpoint theorem]}$$

$$= \frac{1}{2} \times 5 = 2.5 \text{ cm}$$

iii. $BC = 11 \text{ cm}$ [Given]

Points X and Z are the midpoints of sides AB and AC respectively. [Given]

$$\therefore XZ = \frac{1}{2} BC \text{ [Midpoint theorem]}$$

$$= \frac{1}{2} \times 11 = 5.5 \text{ cm}$$

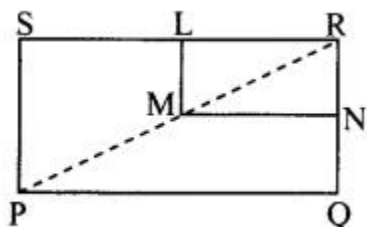
$$l(XY) = 4.5 \text{ cm}, l(YZ) = 2.5 \text{ cm}, l(XZ) = 5.5 \text{ cm}$$

Question 2.

In the adjoining figure, $\square PQRS$ and $\square MNRL$ are rectangles. If point M is the midpoint of side PR, then prove that,

i. $SL = LR$

ii. $LN = \frac{1}{2} SQ$.



Given: $\square PQRS$ and $\square MNRL$ are rectangles. M is the midpoint of side PR.

Solution:

To prove:

i. $SL = LR$

ii. $LN = \frac{1}{2} (SQ)$

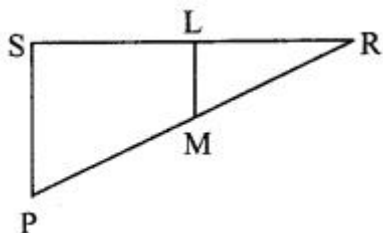
Proof:

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i. $\square PQRS$ and $\square MNRL$ are rectangles. [Given]

$\therefore \angle S = \angle L = 90^\circ$ [Angles of rectangles]

$\angle S$ and $\angle L$ form a pair of corresponding angles on sides SP and LM when SR is their transversal.



$\therefore$ eg $ML \parallel$ seg PS ... (i) [Corresponding angles test]

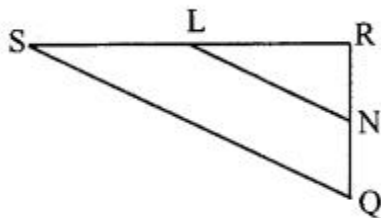
In $\triangle PRS$,

Point M is the midpoint of PR and seg $ML \parallel$ seg PS . [Given] [From (i)]

$\therefore$ Point L is the midpoint of seg SR (ii) [Converse of midpoint theorem]

$\therefore SL = LR$

ii. Similarly for $\triangle PRQ$, we can prove that,



Point N is the midpoint of seg QR (iii)

In $\triangle RSQ$,

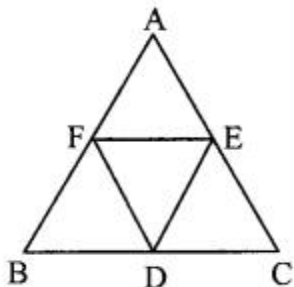
Points L and N are the midpoints of seg SR and seg QR respectively. [From (ii) and (iii)]

$\therefore LN = \frac{1}{2}SQ$ [Midpoint theorem]

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Question 3.

In the adjoining figure, $\triangle ABC$ is an equilateral triangle. Points F, D and E are midpoints of side AB, side BC, side AC respectively. Show that $\triangle FED$ is an equilateral triangle.



Given: $\triangle ABC$ is an equilateral triangle.

Points F, D and E are midpoints of side AB, side BC, side AC respectively.

To prove: $\triangle FED$ is an equilateral triangle.

Solution:

Proof:

$\triangle ABC$ is an equilateral triangle. [Given]

$\therefore AB = BC = AC$ (i) [Sides of an equilateral triangle]

Points F, D and E are midpoints of side AB and BC respectively.

$\therefore FD = \frac{1}{2}AC$ (ii) [Midpoint theorem]

Points D and E are the midpoints of sides BC and AC respectively.

$\therefore DE = \frac{1}{2}AB$ (iii) [Midpoint theorem]

Points F and E are the midpoints of sides AB and AC respectively.

$\therefore FE = \frac{1}{2}BC$

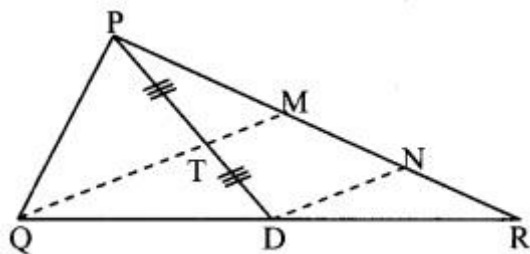
$\therefore FD = DE = FE$ [From (i), (ii), (iii) and (iv)]

$\therefore \triangle FED$ is an equilateral triangle.

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Question 4.

In the adjoining figure, seg PD is a median of $\triangle PQR$. Point T is the midpoint of seg PD. Produced QT intersects PR at M. Show that $PM = MR$. [Hint: Draw $DN \parallel QM$]



Solution:

Given: seg PD is a median of $\triangle PQR$. Point T is the midpoint of seg PD.

To Prove: $PM = MR$

Construction: Draw seg DN $\parallel$ seg QM such that P-M-N and M-N-R.

Proof:

In $\triangle PDN$,

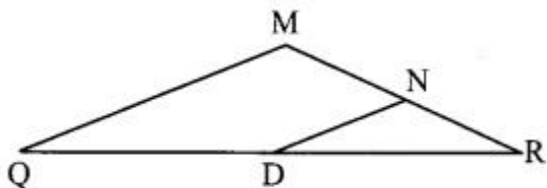
Point T is the midpoint of seg PD and seg TM $\parallel$ seg DN [Given]

$\therefore$ Point M is the midpoint of seg PN. [Construction and Q-T-M]

$\therefore PM = MN$ [Converse of midpoint theorem]

In $\triangle QMR$,

Point D is the midpoint of seg QR and seg DN $\parallel$ seg QM [Construction]



$\therefore$ Point N is the midpoint of seg MR. [Converse of midpoint theorem]

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$$\therefore RN = MN \dots\dots(ii)$$

$$\therefore PM = MN = RN \dots\dots(iii) \text{ [From (i) and (ii)]}$$

$$\text{Now, } PR = PM + MN + RN \text{ [P-M-R-Q-T-M]}$$

$$\therefore PR = PM + PM + PM \text{ [From (iii)]}$$

$$\therefore PR = 3PM$$

$$PM:PR = 1:3$$



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
- Chapter 4.3- Constructions of Triangles
- Chapter 5.1- Quadrilaterals
- Chapter 5.2- Quadrilaterals
- Chapter 5.3- Quadrilaterals
- Chapter 5.4- Quadrilaterals
- Chapter 5.5- Quadrilaterals
- Chapter 6.1- Circle
- Chapter 6.2- Circle
- Chapter 6.3- Circle
- Chapter 7.1- Co-ordinate Geometry
- Chapter 7.2- Co-ordinate Geometry
- Chapter 8.1- Trigonometry
- Chapter 8.2- Trigonometry
- 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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About About Maharashtra State Board (MSBSHSE)

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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How many state boards are there in Maharashtra?

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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