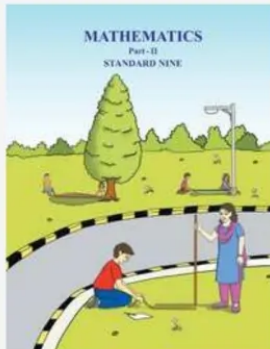


Maharashtra Board Solutions Class 9-Maths

(Part 2): Chapter 3.3- Triangles

BOOK SOLUTIONS
CLASS 9
MATHS (PART 2)

CHAPTER 3.3
Triangles



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 3.3- Triangles

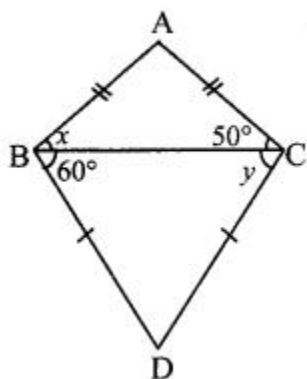
Class 9: Maths Chapter 3.3 solutions. Complete Class 9 Maths Chapter 3.3 Notes.

Maharashtra Board Solutions Class 9-Maths (Part 2): Chapter 3.3- Triangles

Maharashtra Board 9th Maths Chapter 3.3, Class 9 Maths Chapter 3.3 solutions

Question 1.

Find the values of x and y using the information shown in the given figure. Find the measures of $\angle ABD$ and $\angle ACD$.



Solution:

i. $\angle ACB = 50^\circ$ [Given]

In $\triangle ABC$, $\text{seg } AC \cong \text{seg } AB$ [Given]

$\therefore \angle ABC \cong \angle ACB$ [Isosceles triangle theorem]

$\therefore x = 50^\circ$

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ii. $\angle DBC = 60^\circ$ [Given]

In $\triangle BDC$, $BD \cong DC$ [Given]

$\therefore \angle DCB \cong \angle DBC$ [Isosceles triangle theorem]

$\therefore y = 60^\circ$

iii. $\angle ABD = \angle ABC + \angle DBC$ [Angle addition property]

$= 50^\circ + 60^\circ$

$\therefore \angle ABD = 110^\circ$

iv. $\angle ACD = \angle ACB + \angle DCB$ [Angle addition property]

$= 50^\circ + 60^\circ$

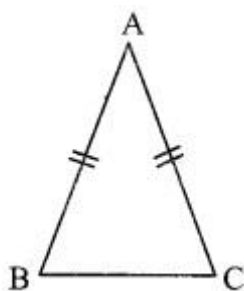
$\therefore \angle ACD = 110^\circ$

$\therefore x = 50^\circ, y = 60^\circ,$

$\angle ABD = 110^\circ, \angle ACD = 110^\circ$

Question 2.

The length of hypotenuse of a right angled triangle is 15. Find the length of median on its hypotenuse.



Solution:

Length of hypotenuse = 15 [Given]

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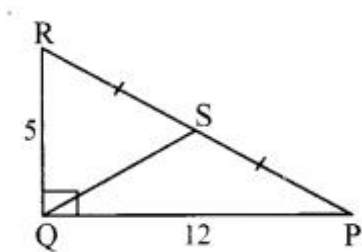
Length of median on the hypotenuse = $\frac{1}{2}$ x length of hypotenuse [In a right angled triangle, the length of the median on the hypotenuse is half the length of the hypotenuse]

$$= \frac{1}{2} \times 15 = 7.5$$

$\therefore$ The length of the median on the hypotenuse is 7.5 units.

Question 3.

In ΔPQR , $\angle Q = 90^\circ$, $PQ = 12$, $QR = 5$ and QS is a median. Find $l(QS)$.



Solution:

i. $PQ = 12$, $QR = 5$ [Given]

In ΔPQR , $\angle Q = 90^\circ$ [Given]

$$\therefore PR^2 = QR^2 + PQ^2 \text{ [Pythagoras theorem]}$$

$$= 25 + 144$$

$$\therefore PR^2 = 169$$

$$\therefore PR = 13 \text{ units [Taking square root of both sides]}$$

ii. In right angled ΔPQR , seg QS is the median on hypotenuse PR .

$\therefore QS = \frac{1}{2}PR$ [In a right angled triangle, the length of the median on the hypotenuse is half the length of the hypotenuse]

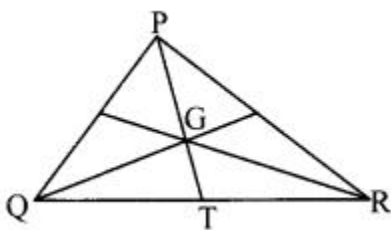
$$= \frac{1}{2} \times 13$$

$$\therefore l(QS) = 6.5 \text{ units}$$

Question 4.

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In the given figure, point G is the point of concurrence of the medians of $\triangle PQR$. If $GT = 2.5$, find the lengths of PG and PT.



Solution:

i. In $\triangle PQR$, G is the point of concurrence of the medians. [Given]

The centroid divides each median in the ratio 2 : 1.

$$PG : GT = 2 : 1$$

$$\therefore \frac{PG}{GT} = \frac{2}{1}$$

$$\therefore \frac{PG}{2.5} = \frac{2}{1}$$

$$\therefore PG = 2 \times 2.5$$

$$\therefore PG = 5 \text{ units}$$

ii. Now, $PT = PG + GT$ [P – G – T]

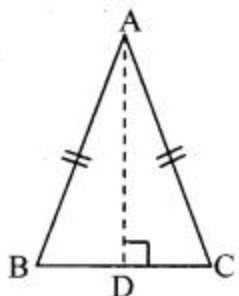
$$= 5 + 2.5$$

$$\therefore l(PG) = 5 \text{ units, } l(PT) = 7.5 \text{ units}$$

Question 1.

Can the theorem of isosceles triangle be proved by doing a different construction?
(Textbook pg. no.34)

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**Solution:**

Yes

Construction: Draw seg $AD \perp$ seg BC .

Proof:

In $\triangle ABD$ and $\triangle ACD$,

seg $AB \cong$ seg AC [Given]

$\angle ADB \cong \angle ADC$ [Each angle is of measure 90°]

seg $AD \cong$ seg AD [Common side]

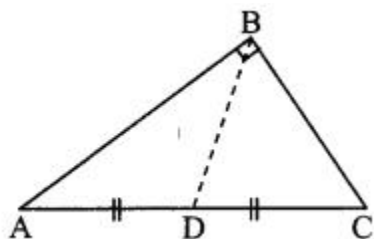
$\therefore \triangle ABD \cong \triangle ACD$ [Hypotenuse side test]

$\therefore \angle ABD \cong \angle ACD$ [c.a.c.t.]

$\therefore \angle ABC \cong \angle ACB$ [B-D-C]

Question 2.

Can the theorem of isosceles triangle be proved without doing any construction?
(Textbook pg, no.34)



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Solution:

Yes

Proof:

In $\triangle ABC$ and $\triangle ACB$,

seg $AB \cong$ seg AC [Given]

$\angle BAC \cong \angle CAB$ [Common angle]

seg $AC \cong$ seg AB [Given]

$\therefore \triangle ABC \cong \triangle ACB$ [SAS test]

$\therefore \angle ABC \cong \angle ACB$ [c. a. c. t.]

Question 3.

In the given figure, $\triangle ABC$ is a right angled triangle, seg BD is the median on hypotenuse. Measure the lengths of the following segments.

i. AD

ii. DC

iii. BD

From the measurements verify that $BD = \frac{1}{2}AC$. (Textbook pg. no. 37)

Solution:

$AD = DC = BD = 1.9$ cm

$AC = AD + DC$ [A – D – C]

$= 1.9 + 1.9$

$= 2 \times 1.9$ cm

$\therefore AC = 2 \times BD$

$\therefore BD = \frac{1}{2}AC$

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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 5.1- Quadrilaterals
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- Chapter 5.5- Quadrilaterals
- Chapter 6.1- Circle
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- 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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