

Maharashtra Board Solutions Class 8-Maths (Practice Set 8.3): Chapter 8- Quadrilateral: Constructions and Types



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Maharashtra Board Solutions Class 8-Maths

(Practice Set 8.3): Chapter 8- Quadrilateral: Constructions and Types

Class 8: Maths Chapter 8 solutions. Complete Class 8 Maths Chapter 8 Notes.

Maharashtra Board Solutions Class 8-Maths (Practice Set 8.3): Chapter 8- Quadrilateral: Constructions and Types

Maharashtra Board 8th Maths Chapter 8, Class 8 Maths Chapter 8 solutions

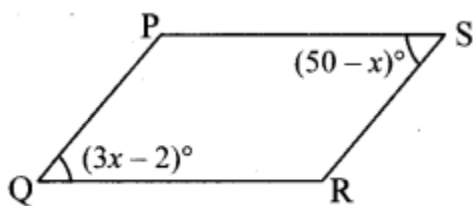
Question 1.

Measures of opposite angles of a parallelogram are $(3x - 2)^\circ$ and $(50 - x)^\circ$. Find the measure of its each angle.

Solution:

Let $\square PQRS$ be the parallelogram.

$$m\angle Q = (3x - 2)^\circ \text{ and } m\angle S = (50 - x)^\circ$$



$$m\angle Q = m\angle S$$

.....(i)

[Opposite angles of a parallelogram are congruent]

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$$\therefore 3x - 2 = 50 - x$$

$$\therefore 3x + x = 50 + 2$$

$$\therefore 4x = 52$$

$$\therefore x = 524$$

$$\therefore x = 13$$

$$\text{Now, } m\angle Q = (3x - 2)^\circ$$

$$= (3 \times 13 - 2)^\circ = (39 - 2)^\circ = 37^\circ$$

$$\therefore m\angle S = m\angle Q = 37^\circ \dots [\text{From (i)}]$$

$$m\angle P + m\angle Q = 180^\circ$$

....[Adjacent angles of a parallelogram are supplementary]

$$\therefore m\angle P + 37^\circ = 180^\circ$$

$$\therefore m\angle P = 180^\circ - 37^\circ = 143^\circ$$

$$\therefore m\angle R = m\angle P = 143^\circ$$

.....[Opposite angles of a parallelogram are congruent]

$\therefore$ The measures of the angles of the parallelogram are 37° , 143° , 37° and 143° .

Question 2.

Referring the given figure of a parallelogram, write the answers of questions given below.

i. If $l(WZ) = 4.5 \text{ cm}$, then $l(XY) = ?$

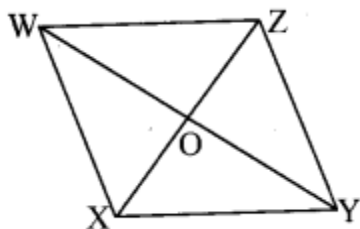
ii. If $l(YZ) = 8.2 \text{ cm}$, then $l(XW) = ?$

iii. If $l(OX) = 2.5 \text{ cm}$, then $l(OZ) = ?$

iv. If $l(WO) = 3.3 \text{ cm}$, then $l(WY) = ?$

v. If $m\angle WZY = 120^\circ$, then $m\angle WXY = ?$ and $m\angle XWZ = ?$

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**Solution:**

i. $l(WZ) = 4.5 \text{ cm} \dots [\text{Given}]$

$l(XY) = l(WZ) \dots [\text{Opposite sides of a parallelogram are congruent}]$

$\therefore l(XY) = 4.5 \text{ cm}$

ii. $l(YZ) = 8.2 \text{ cm} \dots [\text{Given}]$

$l(XW) = l(YZ)$

$\dots [\text{Opposite sides of a parallelogram are congruent}]$

$\therefore l(XW) = 8.2 \text{ cm} \dots [\text{Given}]$

iii. $l(OX) = 2.5 \text{ cm} \dots [\text{Given}]$

$l(OZ) = l(OX)$

$\dots [\text{Diagonals of a parallelogram bisect each other}]$

$\therefore l(OZ) = 2.5 \text{ cm}$

iv. $l(WO) = 3.3 \text{ cm} \dots [\text{Given}]$

$l(WO) = \frac{1}{2} l(WY)$

$\dots [\text{Diagonals of a parallelogram bisect each other}]$

$\therefore 3.3 = \frac{1}{2} l(WY)$

$\therefore 3.3 \times 2 = l(WY)$

$\therefore l(WY) = 6.6 \text{ cm}$

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v. $m\angle WZY = 120^\circ \dots$ [Given]

$$m\angle WXY = m\angle WZY$$

.....[Opposite angles of a parallelogram are congruent]

$$\therefore m\angle WXY = 120^\circ \dots(i)$$

$$m\angle XWZ + m\angle WXY = 180^\circ$$

....[Adjacent angles of a parallelogram are supplementary]

$$\therefore m\angle XWZ + 120^\circ = 180^\circ \dots \text{[From (i)]}$$

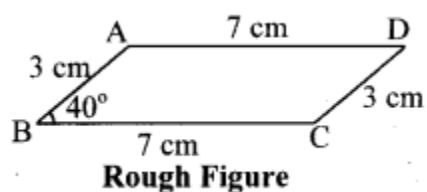
$$\therefore m\angle XWZ = 180^\circ - 120^\circ$$

$$\therefore m\angle XWZ = 60^\circ$$

Question 3.

Construct a parallelogram ABCD such that $l(BC) = 7 \text{ cm}$, $m\angle ABC = 40^\circ$, $l(AB) = 3 \text{ cm}$

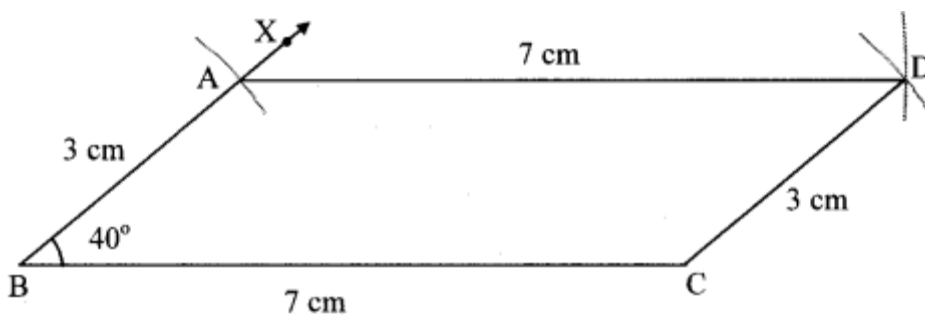
Solution:



Opposite sides of a parallelogram are congruent.

$$\therefore l(AB) = l(CD) = 3 \text{ cm}$$

$$l(BC) = l(AD) = 7 \text{ cm}$$



Question 4.

Ratio of consecutive angles of a quadrilateral is 1 : 2 : 3 : 4. Find the measure of its each angle. Write with reason, what type of a quadrilateral it is.

Solution:

Let $\square PQRS$ be the quadrilateral.

Ratio of consecutive angles of a quadrilateral is 1 : 2 : 3 : 4.

Let the common multiple be x .

$\therefore m\angle P = x^\circ$, $m\angle Q = 2x^\circ$, $m\angle R = 3x^\circ$ and $m\angle S = 4x^\circ$

In $\square PQRS$,

$m\angle P + m\angle Q + m\angle R + m\angle S = 360^\circ$

...[Sum of the measures of the angles of a quadrilateral is 360°]

$\therefore x^\circ + 2x^\circ + 3x^\circ + 4x^\circ = 360^\circ$

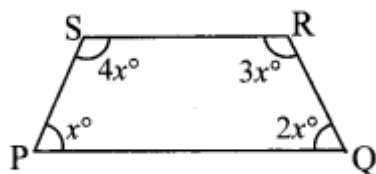
$\therefore 10x^\circ = 360^\circ$

$\therefore x^\circ = \frac{360}{10}$

$\therefore x^\circ = 36^\circ$

$\therefore m\angle P = x^\circ = 36^\circ$

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$$m\angle Q = 2x^\circ = 2 \times 36^\circ = 72^\circ$$

$$m\angle R = 3x^\circ = 3 \times 36^\circ = 108^\circ \text{ and}$$

$$m\angle S = 4x^\circ = 4 \times 36^\circ = 144^\circ$$

$\therefore$ The measures of the angles of the quadrilateral are 36° , 72° , 108° , 144° .

$$\text{Here, } m\angle P + m\angle S = 36^\circ + 144^\circ = 180^\circ$$

Since, interior angles are supplementary,

$\therefore$ side PQ $\parallel$ side SR

$$m\angle P + m\angle Q = 36^\circ + 72^\circ = 108^\circ \neq 180^\circ$$

$\therefore$ side PS is not parallel to side QR.

Since, one pair of opposite sides of the given quadrilateral is parallel.

$\therefore$ The given quadrilateral is a trapezium.

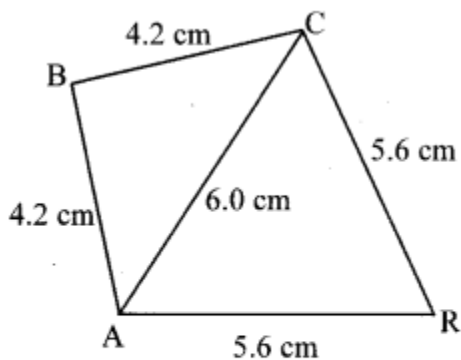
Question 5.

Construct $\square$ BARC such that

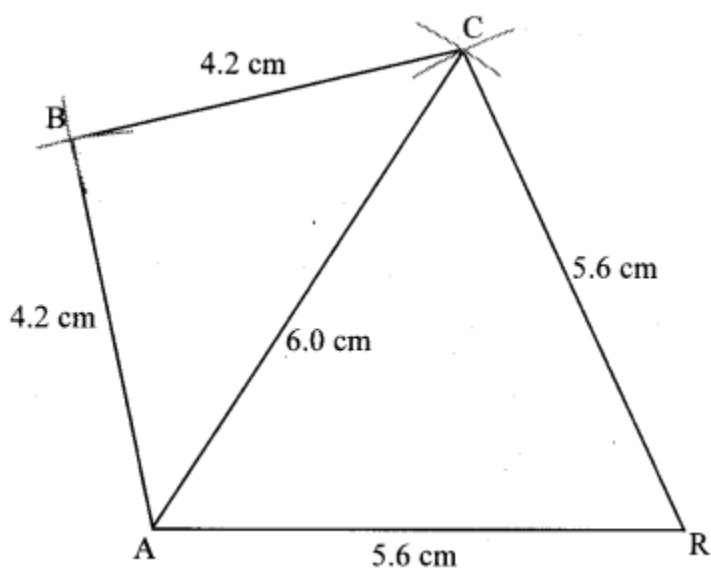
$$l(\overline{BA}) = l(\overline{BC}) = 4.2 \text{ cm}, l(\overline{AC}) = 6.0 \text{ cm}, l(\overline{AR}) = l(\overline{CR}) = 5.6 \text{ cm}$$

Solution:

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Rough Figure

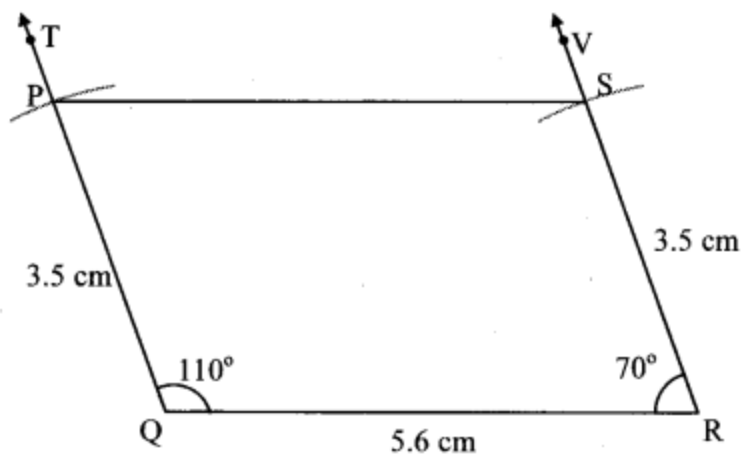
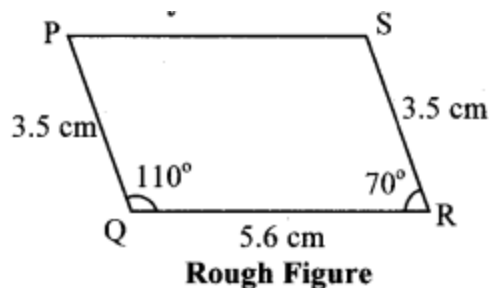


Question 6.

Construct $\square PQRS$, such that $l(PQ) = 3.5$ cm, $l(QR) = 5.6$ cm, $l(RS) = 3.5$ cm, $m\angle Q = 110^\circ$, $m\angle R = 70^\circ$. If it is given that $\square PQRS$ is a parallelogram, which of the given information is unnecessary?

Solution:

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1. Since, the opposite sides of a parallelogram are congruent.
 $\therefore$ Either $l(PQ)$ or $l(SR)$ is required.
2. To construct a parallelogram lengths of adjacent sides and measure of one angle is required.
 $\therefore$ Either $l(PQ)$ and $m\angle Q$ or $l(SR)$ and $m\angle R$ is the unnecessary information given in the question.

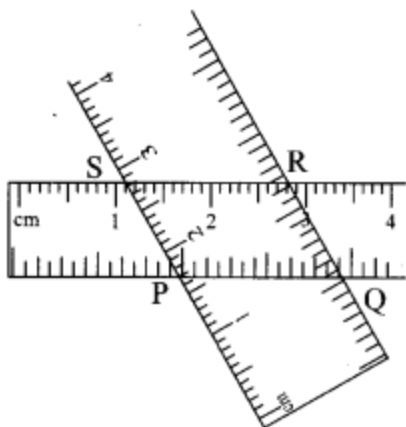
Intext Questions and Activities

Question 1.

Draw a parallelogram PQRS. Take two rulers of different widths, place one ruler horizontally and draw lines along its edges. Now place the other ruler in slant position over the lines drawn and draw lines along its edges. We get a parallelogram. Draw the diagonals of it and name the point of intersection as T.

1. Measure the opposite angles of the parallelogram.
2. Measure the lengths of opposite sides.
3. Measure the lengths of diagonals.
4. Measure the lengths of parts of the diagonals made by point T. (Textbook pg. no. 47)

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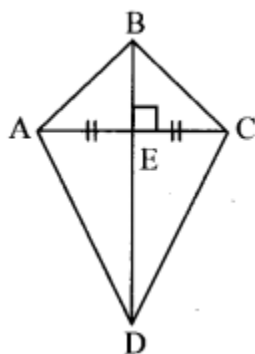


Solution:

[Students should attempt the above activities on their own.]

Question 2.

In the given figure of $\square ABCD$, verify with a divider that $\text{seg } AB \cong \text{seg } CB$ and $\text{seg } AD \cong \text{seg } CD$. Similarly measure $\angle BAD$ and $\angle BCD$ and verify that they are congruent. (Textbook pg. no. 48)



Solution:

[Students should attempt the above activities on their own.]

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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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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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