



Mount Abu Public School

H-Block, Sector-18, Rohini, New Delhi-110085

SUBJECT:- MATHEMATICS

CLASS- VIII

Week:15th February 2021 to 21st February 2021

Number of blocks: 4

CHAPTER- 12 : Practical Geometry

Sub-Topics:

A quadrilateral can be constructed uniquely if

- Four sides and a diagonal is given
- Three sides and two diagonals are given
- Two adjacent sides and three angles are given
- Three sides and two included angles are given

Link for the chapter <https://ncert.nic.in/textbook/textbook.htm?hemh1=0-16>

Learning Outcomes:

Each student will be able to:

- Properties of quadrilateral – Sum of angles of a quadrilateral is 360°
- Measure angles using a protractor
- Use geometrical results to determine unknown angles
- Construct special quadrilateral such as square, rhombus, parallelogram and rectangle

Teaching Aids Used:

Presentation of E-lesson, YouTube videos by screen sharing, white board and marker using laptop/mobile

GUIDELINES:

Dear students,

Kindly read the content given below and view the links shared for better understanding.

Solve the given questions in math notebook

Day -1

LESSON DEVELOPMENT

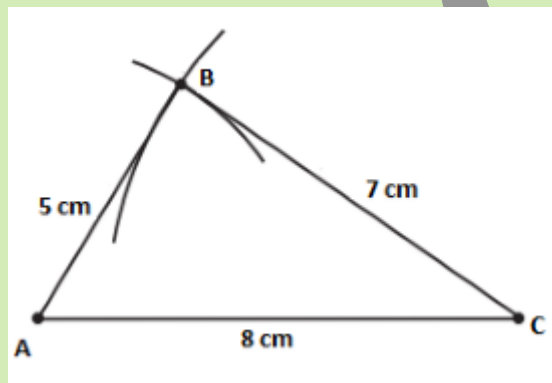
1. If the four sides and a diagonal of the quadrilateral are given.

Example

Construct a quadrilateral ABCD in which $AB = 5$ cm, $BC = 7$ cm, $CD = 6$ cm, $DA = 6.5$ cm and $AC = 8$ cm.

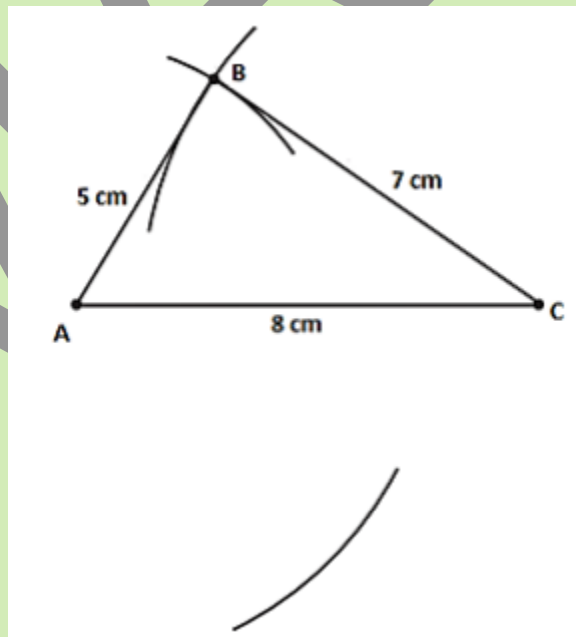
Solution

Step 1: $\triangle ABC$ can be constructed using SSS criterion of the construction of triangle.

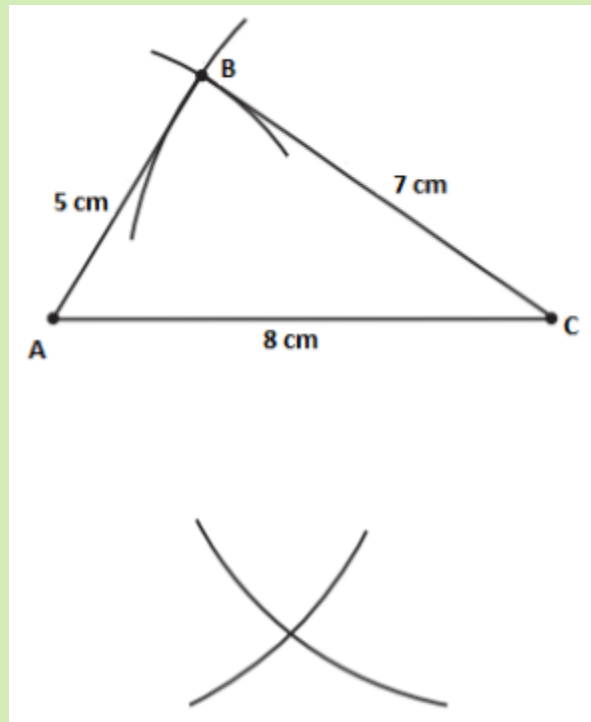


Step 2: Here we can see that AC is diagonal, so D will be somewhere opposite to B with reference to AC.

$AD = 6.5$ cm so draw an arc from A as the centre with radius 6.5 cm.



Step 3: Now draw an arc with C as the centre and by taking radius 6 cm so that it intersects the above arc.



Step 4: The point of intersection of the two arcs is point D. Now join AD and DC to complete the quadrilateral. Hence, ABCD is the required quadrilateral.

ASSIGNMENT:

Complete the following questions from Exercise 12 of your book (page 228)

Q 2 , 3 , 5 , 9 , 10

Day- 2

2. If two diagonals and three sides of the quadrilateral are given

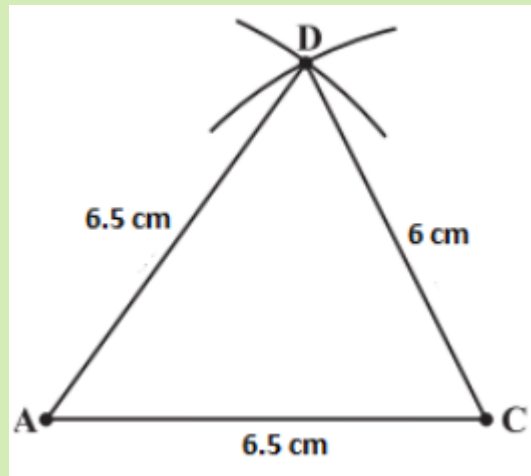
Example

Construct a quadrilateral ABCD if the two diagonals are $AC = 6.5$ cm and $BD = 8$ cm. The other sides are $BC = 5.5$ cm, $AD = 6.5$ cm and $CD = 6$ cm.

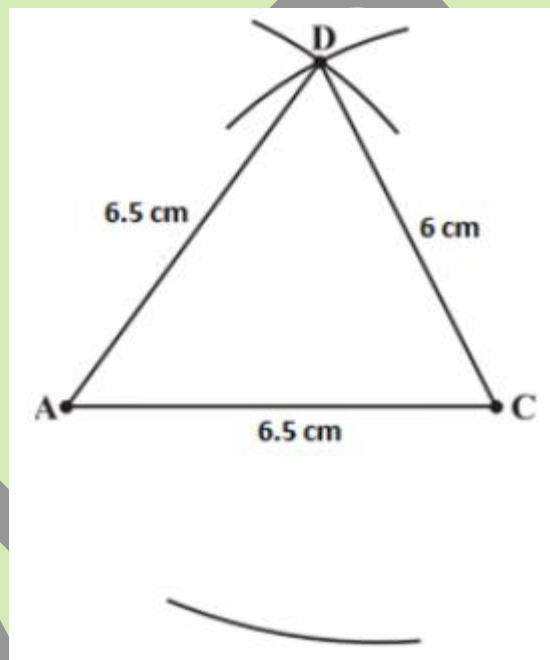
Solution

First of all, draw a rough sketch of the quadrilateral by using the given measurements. Then start constructing the real one.

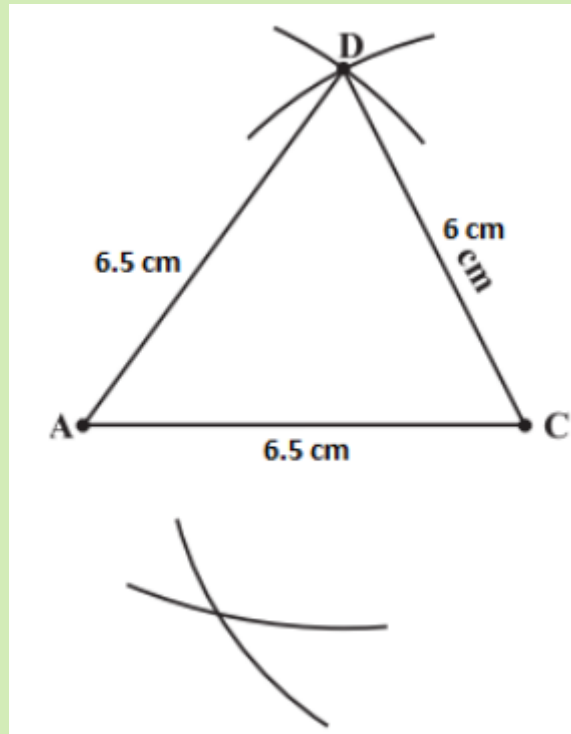
Step 1: We can see that AD, AC and DC are given so we can construct a triangle $\triangle ACD$ by using SSS criterion.



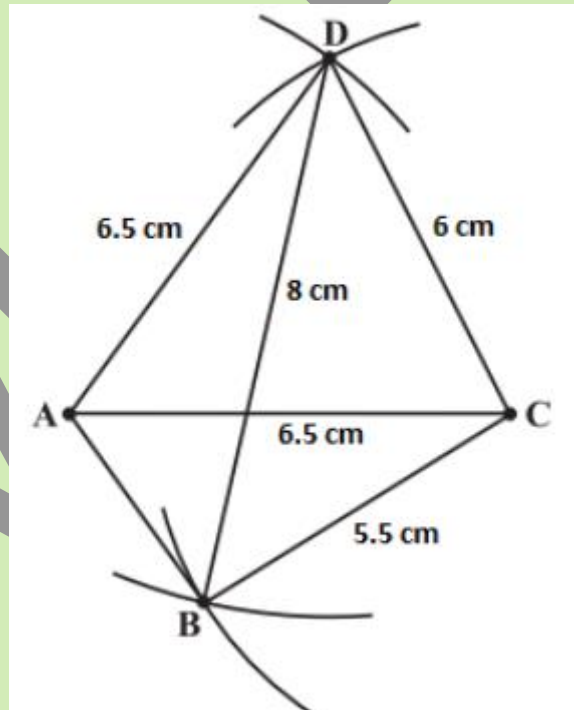
Step 2: Now, we know that BD is given so we can draw the point B keeping D as the centre and draw an arc of radius 8 cm just opposite to the point D with reference to AC.



Step 3: BC is given so we can draw an arc keeping C as centre and radius 5.5 cm so that it intersects the other arc.



Step 4: That point of intersection of the arcs is point B. Join AB and BC to complete the quadrilateral.



ABCD is the required quadrilateral.

ASSIGNMENT:

Complete the following questions from Exercise 12 of your book (page 228-229)

5, 13, 15

Day-3

3. If three angles and two adjacent sides of the quadrilateral are given.

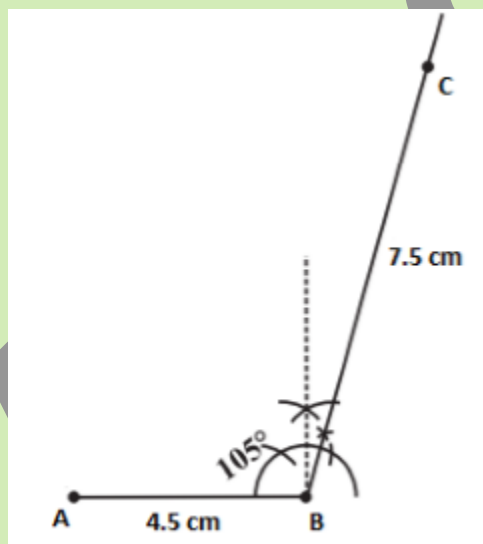
Example

Construct a quadrilateral ABCD in which the two adjacent sides are $AB = 4.5$ cm and $BC = 7.5$ cm. The given three angles are $\angle A = 75^\circ$, $\angle B = 105^\circ$ and $\angle C = 120^\circ$.

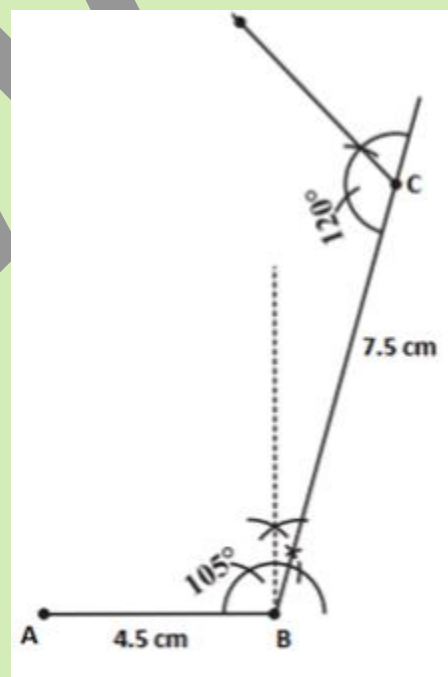
Solution

Draw a rough sketch so that we can construct easily.

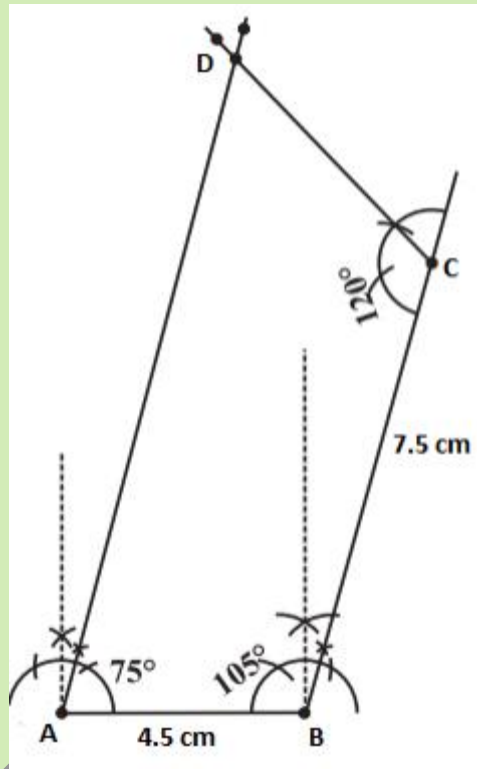
Step 1: Draw $AB = 4.5$ cm. Then measure $\angle B = 105^\circ$ using protractor and draw $BC = 7.5$ cm.



Step 2: Draw $\angle C = 120^\circ$.



Step 3: Measure $\angle A = 75^\circ$ and make a line until it touches the line coming from point C.



ABCD is the required quadrilateral.

ASSIGNMENT:

Complete the following questions from Exercise 12 of your book (page 228-229)

4, 7, 8

Day-4

4. If the three sides with two included angles of the quadrilateral are given.

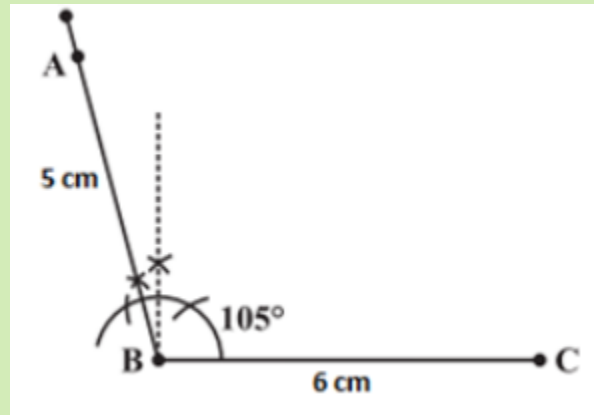
Example

Construct a quadrilateral ABCD in which the three sides are $AB = 5$ cm, $BC = 6$ cm and $CD = 7.5$ cm. The two included angles are $\angle B = 105^\circ$ and $\angle C = 80^\circ$.

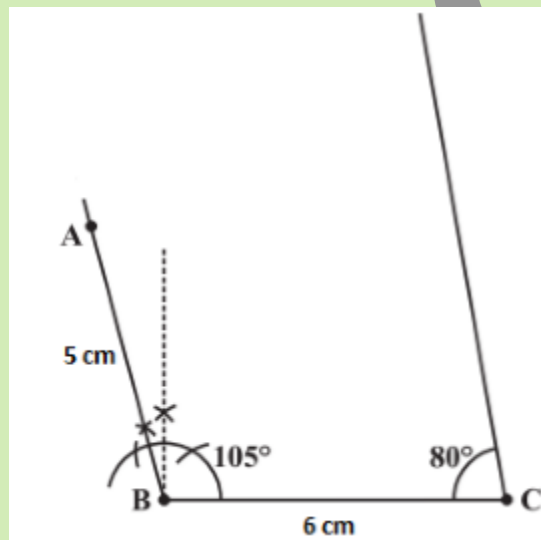
Solution

Draw a rough sketch.

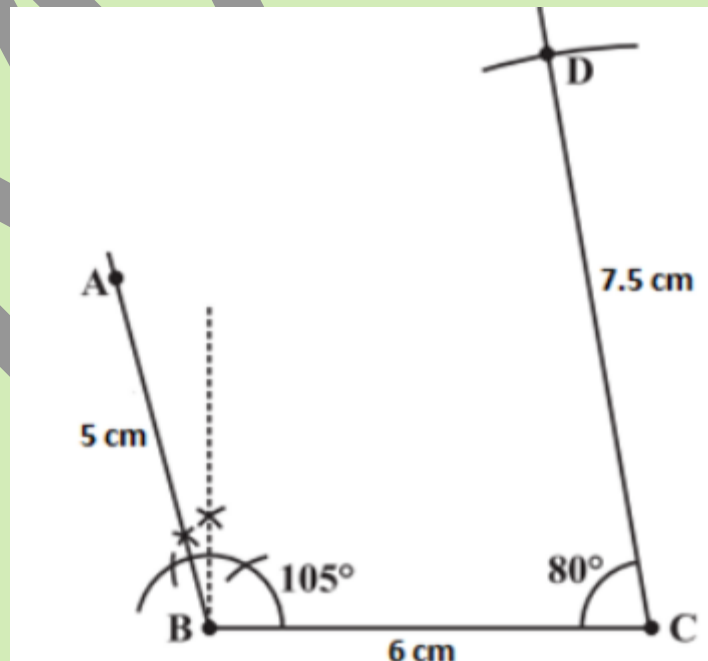
Step 1: Draw the line $BC = 6$ cm. Then draw $\angle B = 105^\circ$ and mark the length of $AB = 5$ cm.



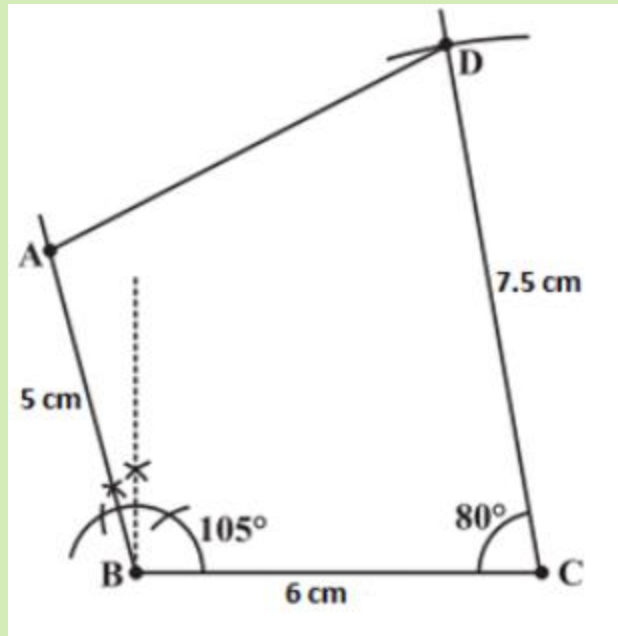
Step 2: Draw $\angle C = 80^\circ$ using protractor towards point B.



Step 3: Mark the length of CD i.e. 7.5 cm from C to make $CD = 7.5$ cm.



Step 4: Join AD which will complete the quadrilateral ABCD.



Hence ABCD is the required quadrilateral.

ASSIGNMENT:

Complete the following questions from Exercise 12 of your book (page 228-229)

1, 6

Day-5

Some Special Cases

There are some special cases in which we can construct the quadrilateral with less number of measurements also.

Example

Construct a square READ with RE = 5.1 cm.

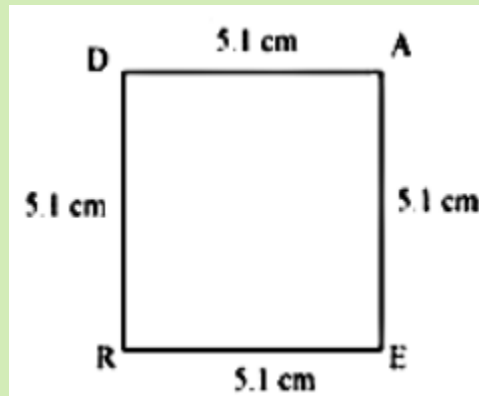
Solution

Given RE = 5.1 cm.

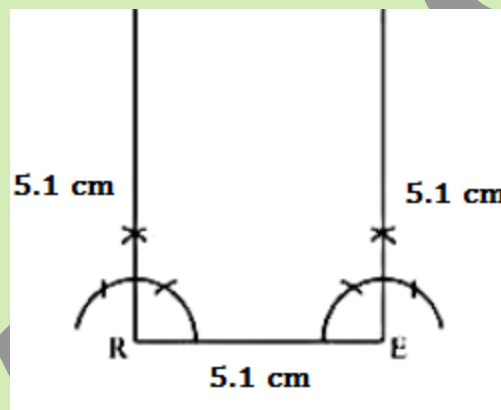
As it is a special quadrilateral called square, we can get more details out of it.

- All sides of square are equal, so $RE = EA = AD = RD = 5.1$ cm.
- All the angles of a square are 90° , so $\angle R = \angle E = \angle A = \angle D = 90^\circ$

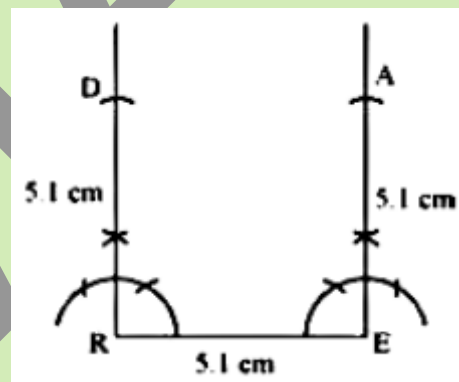
Step 1: Draw a rough sketch of the square.



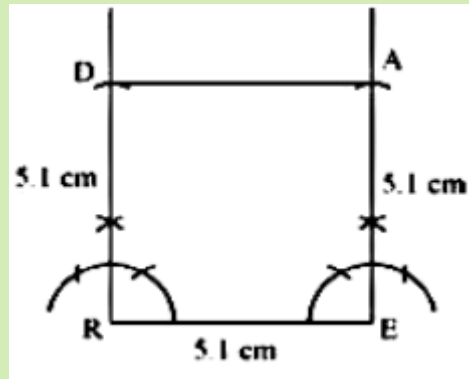
Step 2: To construct a square, draw a line segment $RE = 5.1$ cm. Then draw the angle of 90° at both ends R and E of the line segment RE.



Step 3: As all the sides of the square READ are equal, draw the arc of 5.1 cm from the vertex R and E to cut the lines RD and EA respectively.



Step 4: Join A and D to make a line segment AD.



READ is the required square.

ASSIGNMENT:

Complete the following questions from Exercise 12 of your book (page 228-229)

12 , 13, 14 , 15 , 16

Link:

<https://www.youtu.be/wjnk3HAtCB4>

<https://www.youtu.be/PF-KnhQ-xOA>

Revise and practice all the questions

EXTRA QUESTIONS:

- Q1) Construct a quadrilateral ABCD where $AB = 4.5$ cm $BC = 5.5$ cm $CD = 4$ cm $AD = 6$ cm $AC = 7$ cm.
- Q2) Construct a quadrilateral JUMP where $JU = 3.5$ cm $UM = 4$ cm $MP = 5$ cm $PJ = 4.5$ cm $PU = 6.5$ cm.
- Q3) Construct a Rhombus BEND with $BN = 5.6$ cm $DE = 6.5$ cm.
- Q4) Construct a quadrilateral PQRS where $PQ = 3.6$ cm, $QR = 5.5$ cm, $RS = 5$ cm $\angle B = 125^\circ$ and $\angle C = 80^\circ$.
- Q5) Construct a quadrilateral PQRS where $PQ = 6$ cm, $QR = 4$ cm, $RS = 4$ cm, $\angle Q = 95^\circ$ and $\angle R = 90^\circ$.
- Q6) Draw a rhombus with 5.2 cm and 6.4 cm long diagonals.
- Q7) Construct a Quadrilateral DEAR where $DE = 4$ cm $EA = 5$ cm $AR = 4.5$ cm $\angle E = 60^\circ$.
- Q8) Construct a Quadrilateral PLAN with $PL = 4$ cm $LA = 6.5$ cm $\angle P = 90^\circ$ $\angle A = 110^\circ$ $\angle N = 85^\circ$.
- Q9) Construct a quadrilateral PQRS where $PQ = 5$ cm, $QR = 5.5$ cm, $RS = 2.5$ cm, $SP = 7.1$ cm and $PR = 8$ cm.
- Q10) Draw a rectangle whose adjacent sides are 4.5 cm and 2.3 cm.
- Q11) Draw a parallelogram whose adjacent sides are 2.8 cm and 3.8 cm.
- Q12) Construct a quadrilateral PQRS where $PQ = 5.4$ cm, $\angle P = 60^\circ$, $\angle Q = 105^\circ$, $\angle R = 75^\circ$ and $\angle S = 120^\circ$.