

Introduction

In this chapter, we will learn to construct the quadrilaterals.

There are five different cases in the construction of quadrilaterals. The cases are as follows:

Case 1 – To construct a quadrilateral when 4 sides and one diagonal are given.

Case 2 – To construct a quadrilateral when 3 sides and 3 diagonals are given.

Case 3 – To construct a quadrilateral when 3 sides and 2 included angles are given.

Case 4 – To construct a quadrilateral when 2 adjacent sides and 3 angles are given.

Case 5 – To construct a quadrilateral when 4 sides and 1 angle are given.

Let us understand the cases through examples:

Example 1 – Construct a quadrilateral ABCD in which AB = 4.8 cm, BC = 4.3 cm, CD = 3.6 cm, AD = 4.2 cm and diagonal AC = 6 cm

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment AB = 4.8 cm

Step2 – Taking A as Centre and radius of 6 cm, draw an arc.

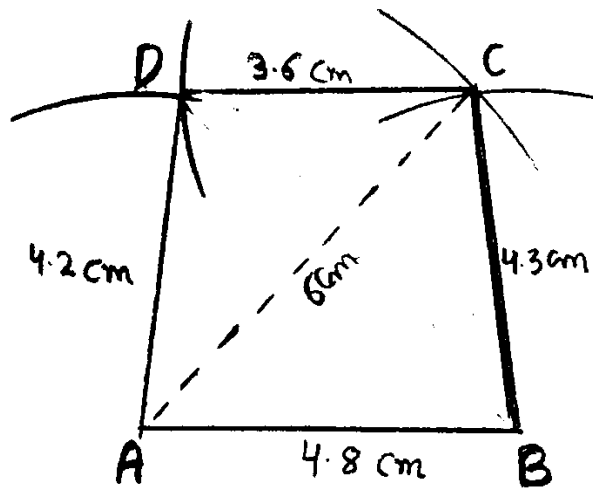
Step3 – Taking B as Centre and radius of 4.3 cm, draw another arc which cuts the previous arc at point C.

Step4 – Join BC

Step5 – Now, with A as Centre and radius of 4.2 cm, draw an arc.

Step6 – With C as Centre and radius of 3.6 cm, draw another arc which cuts the previous arc at point D.

Step7 – Join AD and CD



Example 2 – Construct a quadrilateral ABCD in which $AB = 4$ cm, $BC = 3.8$ cm, $AD = 3$ cm, diagonal $AC = 5$ cm and diagonal $BD = 4.6$ cm.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 4$ cm

Step2 – Taking A as Centre and radius of 5 cm, draw an arc.

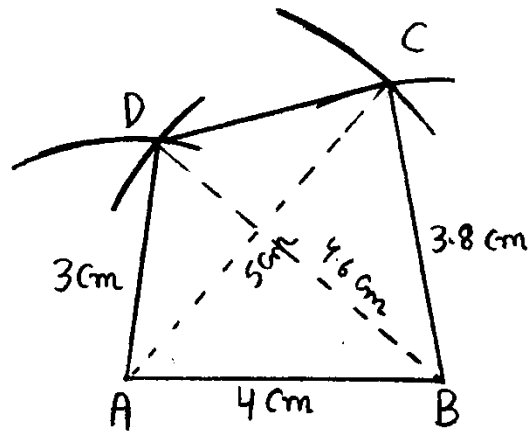
Step3 – Taking B as Centre and radius of 3.8 cm, draw another arc which cuts the previous arc at point C.

Step4 – Join BC

Step5 – Now, with A as Centre and radius of 3 cm, draw an arc.

Step6 – With B as Centre and radius of 4.6 cm, draw another arc which cuts the previous arc at point D.

Step7 – Join AD and CD



Example 3 – Construct a quadrilateral ABCD in which $AB = 3.6$ cm, $\angle ABC = 80^\circ$, $BC = 4$ cm, $\angle BAD = 120^\circ$ and $AD = 5$ cm.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 3.6$ cm

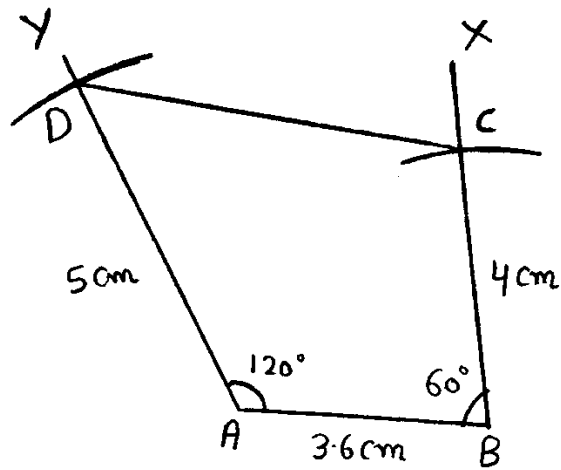
Step2 – Make an angle $\angle ABX = 80^\circ$.

Step3 – Taking B as Centre and radius of 4 cm, draw an arc which cuts BX at point C.

Step4 – Now, make $\angle BAY = 120^\circ$.

Step5 – Taking A as Centre and radius of 5 cm, draw an arc which cuts AY at point D.

Step6 – Join CD.



Example 4 – Construct a quadrilateral PQRS in which $PQ = 4.5$ cm, $\angle PQR = 120^\circ$, $QR = 3.8$ cm, $\angle QRS = 100^\circ$ and $\angle QPS = 60^\circ$.

Solution - The steps for the construction of this quadrilateral are as follows:

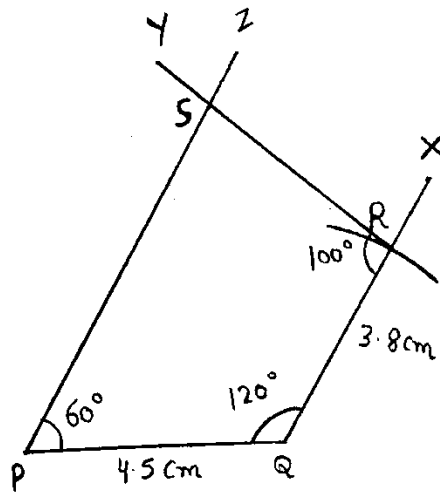
Step1 – First, we draw line segment $PQ = 4.5$ cm

Step2 – Make an angle $\angle PQX = 120^\circ$.

Step3 – Taking Q as Centre and radius of 3.8 cm, draw an arc which cuts QX at point R.

Step4 – Make an angle $\angle QRY = 100^\circ$

Step5 – Make an angle $\angle QPZ = 60^\circ$ in such a way that PZ and RY intersect each other at the point S.



Example 5 – Construct a quadrilateral ABCD in which AB = 3.8 cm, BC = 3.4 cm, CD = 4.5 cm, AD = 5 cm and $\angle B = 80^\circ$

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment AB = 3.8 cm

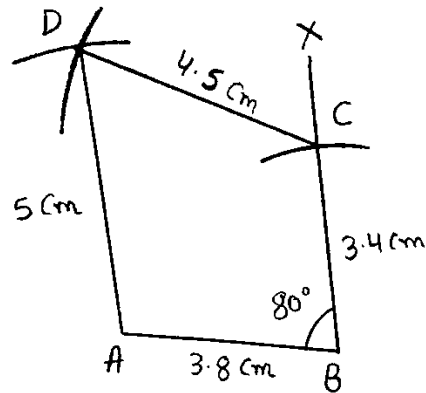
Step2 – Make an angle $\angle ABX = 80^\circ$.

Step3 – Taking B as Centre and radius of 3.4 cm, draw an arc which cuts BX at point C.

Step4 – Taking A as Centre and radius of 5 cm, draw an arc.

Step5 – Taking C as Centre and radius of 4.5 cm, draw another arc in such a way that it cuts previous arc at point D.

Step6 – Join AD and CD



Exercise 17 A

Question 1 – Construct a quadrilateral ABCD in which $AB = 4.2$ cm, $BC = 6$ cm, $CD = 5.2$ cm, $DA = 5$ cm and $AC = 8$ cm.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 4.2$ cm

Step2 – Taking A as Centre and radius of 8 cm, draw an arc.

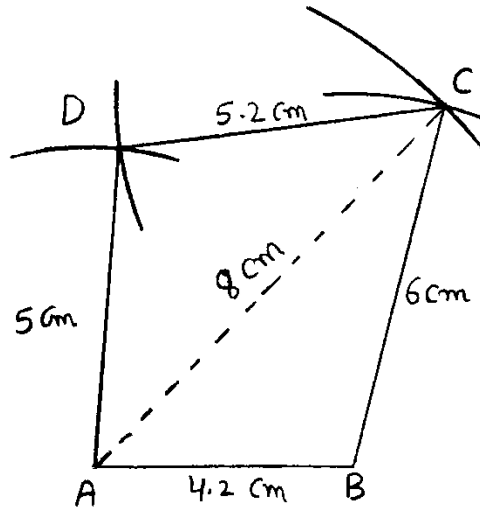
Step3 – Taking B as Centre and radius of 6 cm, draw another arc which cuts the previous arc at point C.

Step4 – Join BC

Step5 – Now, with A as Centre and radius of 5 cm, draw an arc.

Step6 – With C as Centre and radius of 5.2 cm, draw another arc which cuts the previous arc at point D.

Step7 – Join AD and CD



Question 2 – Construct a quadrilateral PQRS in which $PQ = 5.4$ cm, $QR = 4.6$ cm, $RS = 4.3$ cm, $SP = 3.5$ cm and diagonal $PR = 4$ cm

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $PQ = 5.4$ cm

Step2 – Taking P as Centre and radius of 4 cm, draw an arc.

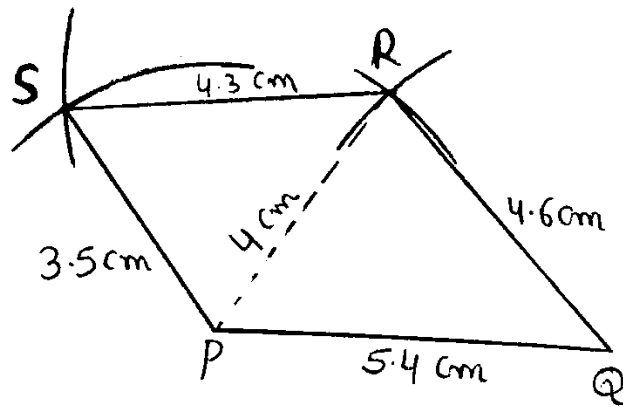
Step3 – Taking Q as Centre and radius of 4.6 cm, draw another arc which cuts the previous arc at point R.

Step4 – Join QR.

Step5 – Now, with P as Centre and radius of 3.5 cm, draw an arc.

Step6 – With R as Centre and radius of 4.3 cm, draw another arc which cuts the previous arc at point S.

Step7 – Join PS and SR



Question 3 – Construct a quadrilateral ABCD in which $AB = 3.5$ cm, $BC = 3.8$ cm, $CD = DA = 4.5$ cm and diagonal $BD = 5.6$ cm.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 3.5$ cm

Step2 – Taking B as Centre and radius of 5.6 cm, draw an arc.

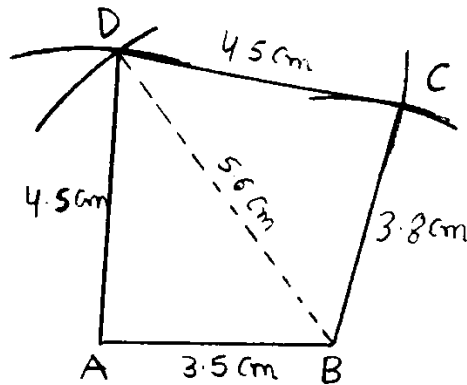
Step3 – Taking A as Centre and radius of 4.5 cm, draw another arc which cuts the previous arc at point D.

Step4 – Join AD

Step5 – Now, with B as Centre and radius of 3.8 cm, draw an arc.

Step6 – With D as Centre and radius of 4.5 cm, draw another arc which cuts the previous arc at point C.

Step7 – Join CB and CD



Question 4 – Construct a quadrilateral ABCD in which $AB = 3.6$ cm, $BC = 3.3$ cm, $AD = 2.7$ cm, diagonal $AC = 4.6$ cm and diagonal $BD = 4$ cm.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 3.6$ cm

Step2 – Taking A as Centre and radius of 4.6 cm, draw an arc.

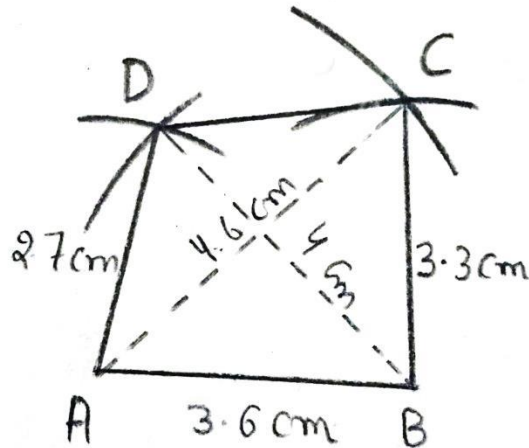
Step3 – Taking B as Centre and radius of 3.3 cm, draw another arc which cuts the previous arc at point C.

Step4 – Join BC

Step5 – Now, with A as Centre and radius of 2.7 cm, draw an arc.

Step6 – With B as Centre and radius of 4 cm, draw another arc which cuts the previous arc at point D.

Step7 – Join AD and CD



Question 5 – Construct a quadrilateral PQRS in which $QR = 7.5$ cm, $PR = PS = 6$ cm, $RS = 5$ cm and $QS = 10$ cm. Measure the fourth side.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $QR = 7.5$ cm

Step2 – Taking Q as Centre and radius of 10 cm, draw an arc.

Step3 – Taking R as Centre and radius of 5 cm, draw another arc which cuts the previous arc at point S.

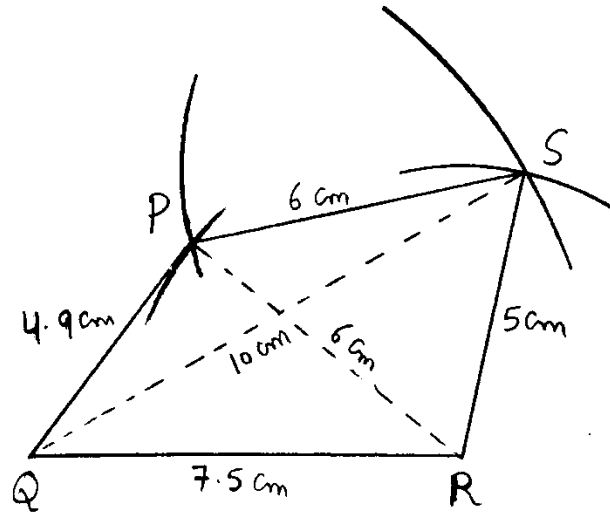
Step4 – Join RS

Step5 – Now, with R as Centre and radius of 6 cm, draw an arc.

Step6 – With S as Centre and radius of 6 cm, draw another arc which cuts the previous arc at point P.

Step7 – Join PS and PR and PQ

Step8 – Measure the fourth side PQ.



Question 6 – Construct a quadrilateral ABCD in which AB = 3.4 cm, CD = 3 cm, DA = 5.7 cm, AC = 8 cm and BD = 4 cm.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment AB = 3.4 cm

Step2 – Taking B as Centre and radius of 4 cm, draw an arc.

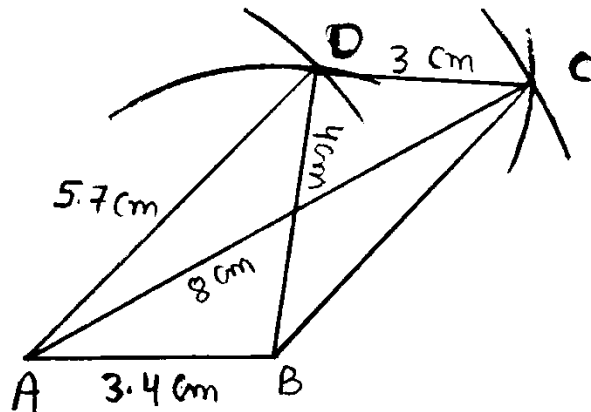
Step3 – Taking A as Centre and radius of 5.7 cm, draw another arc which cuts the previous arc at point D.

Step4 – Join AD

Step5 – Now, with D as Centre and radius of 3 cm, draw an arc.

Step6 – With A as Centre and radius of 8 cm, draw another arc which cuts the previous arc at point C.

Step7 – Join CD and BC



Question 7 – Construct a quadrilateral ABCD in which $AB = BC = 3.5$ cm, $AD = CD = 5.2$ cm and $\angle ABC = 120^\circ$

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 3.5$ cm

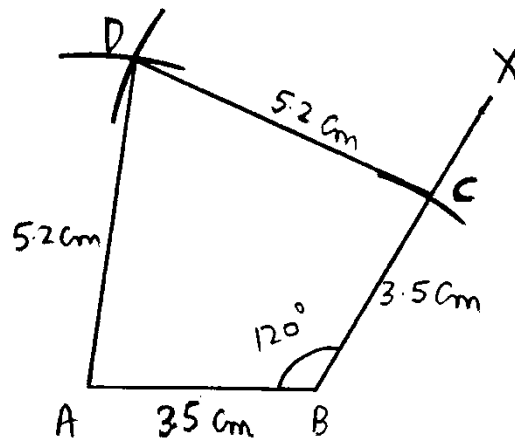
Step2 – Make an angle $\angle ABX = 120^\circ$.

Step3 – Taking B as Centre and radius of 3.5 cm, draw an arc which cuts BX at point C.

Step4 – Taking A as Centre and radius of 5.2 cm, draw an arc.

Step5 – Taking C as Centre and radius of 5.2 cm, draw another arc in such a way that it cuts previous arc at point D.

Step6 – Join AD and CD



Question 8 – Construct a quadrilateral ABCD in which $AB = 2.9$ cm, $BC = 3.2$ cm, $CD = 2.7$ cm, $DA = 3.4$ cm and $\angle A = 70^\circ$

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 2.9$ cm

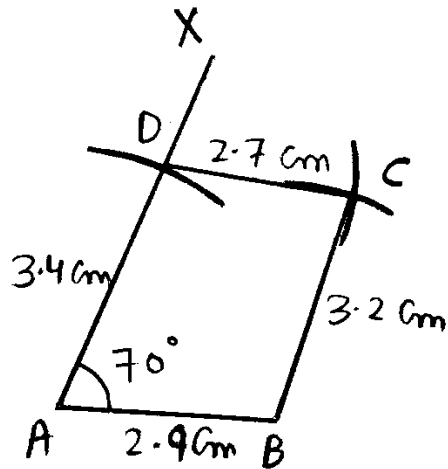
Step2 – Make an angle $\angle BAX = 70^\circ$.

Step3 – Taking A as Centre and radius of 3.4 cm, draw an arc which cuts AX at point D.

Step4 – Taking B as Centre and radius of 3.2 cm, draw an arc.

Step5 – Taking D as Centre and radius of 2.7 cm, draw another arc in such a way that it cuts previous arc at point C.

Step6 – Join BC and CD



Question 9 – Construct a quadrilateral ABCD in which $AB = 3.5$ cm, $BC = 5$ cm, $CD = 4.6$ cm, $\angle B = 125^\circ$ and $\angle C = 60^\circ$

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 3.5$ cm

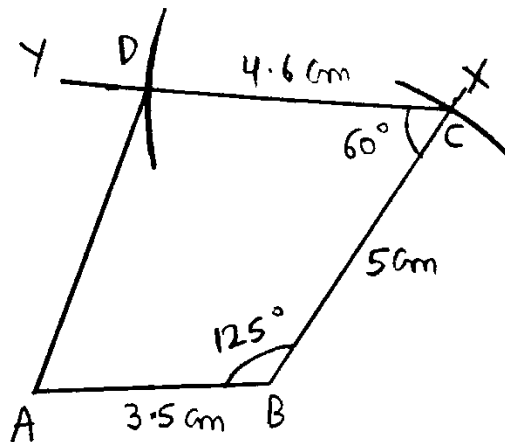
Step2 – Make an angle $\angle ABX = 125^\circ$.

Step3 – Taking B as Centre and radius of 5 cm, draw an arc which cuts BX at point C.

Step4 – Now, make $\angle BCY = 60^\circ$.

Step5 – Taking C as Centre and radius of 4.6 cm, draw an arc which cuts CY at point D.

Step6 – Join AD.



Question 10 – Construct a quadrilateral PQRS in which $PQ = 6$ cm, $QR = 5.6$ cm, $RS = 2.7$ cm, $\angle Q = 45^\circ$, $\angle R = 90^\circ$

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $PQ = 6$ cm

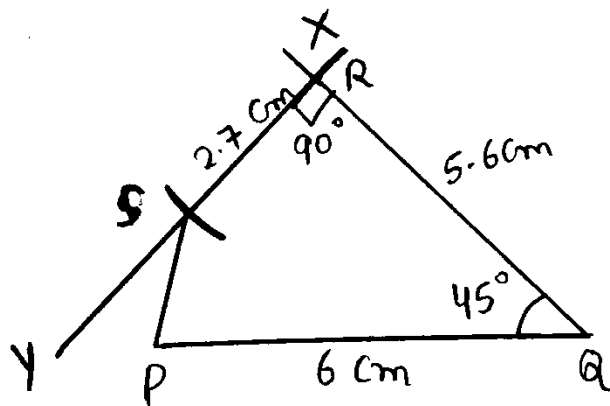
Step2 – Make an angle $\angle PQX = 45^\circ$.

Step3 – Taking Q as Centre and radius of 5.6 cm, draw an arc which cuts QX at point R.

Step4 – Now, make $\angle QRY = 90^\circ$.

Step5 – Taking R as Centre and radius of 2.7 cm, draw an arc which cuts RY at point S.

Step6 – Join PS.



Question 11 – Construct a quadrilateral ABCD in which $AB = 5.6$ cm, $BC = 4$ cm, $\angle A = 50^\circ$, $\angle B = 105^\circ$ and $\angle D = 80^\circ$.

Solution - The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 5.6$ cm

Step2 – Make an angle $\angle ABX = 105^\circ$ and $\angle BAY = 50^\circ$

Step3 – Taking B as Centre and radius of 4 cm, draw an arc which cuts BX at point C.

Step4 –Now, we have to calculate $\angle C$.

We know that sum of 4 angles of quadrilateral = 360°

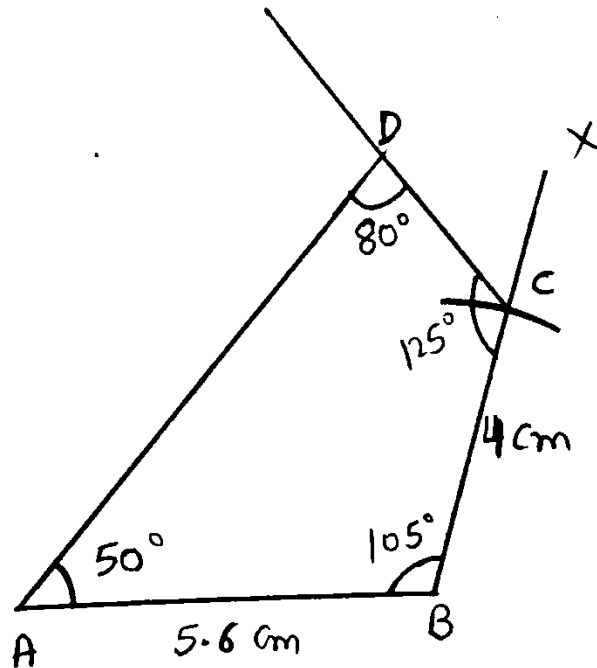
$$\Rightarrow 50 + 105 + 80 + \angle C = 360$$

$$\Rightarrow 235 + \angle C = 360$$

$$\Rightarrow \angle C = 360 - 235 = 125$$

Step5 – Taking C as Centre, make angle $\angle C = 125^\circ$

Step6 – Now, Join CD



Question 12 – Construct a quadrilateral PQRS in which $PQ = 5$ cm, $QR = 6.5$ cm, $\angle P = \angle R = 100^\circ$ and $\angle S = 75^\circ$

Solution - The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $PQ = 5$ cm

Step2 – Now, we have to calculate $\angle Q$.

We know that sum of 4 angles of quadrilateral = 360°

$$\Rightarrow 100 + 100 + 75 + \angle Q = 360$$

$$\Rightarrow 275 + \angle Q = 360$$

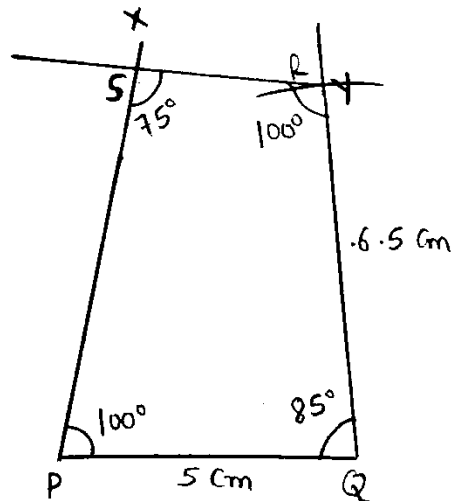
$$\Rightarrow \angle Q = 360 - 275 = 85$$

Step3 – Make an angle $\angle QPX = 100^\circ$ and $\angle PQY = 85^\circ$

Step4 – Taking Q as Centre and radius of 6.5 cm, draw an arc which cuts QY at point R.

Step5 – Taking R as Centre, make angle $\angle R = 100^\circ$

Step6 – Now, Join RS



Question 13 – Construct a quadrilateral ABCD in which AB = 4 cm, AC = 5 cm, AD = 5.5 cm and $\angle ABC = \angle ACD = 90^\circ$

Solution - The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment AB = 4 cm

Step2 – Make an angle $\angle ABX = 90^\circ$,

Step3 – We will find the length of BC by using Pythagoras theorem in triangle ABC

In triangle ABC, $AC^2 = AB^2 + BC^2$

$$\Rightarrow (5)^2 = (4)^2 + BC^2$$

$$\Rightarrow 25 = 16 + BC^2$$

$$\Rightarrow 25 - 16 = BC^2$$

$$\Rightarrow BC^2 = 9$$

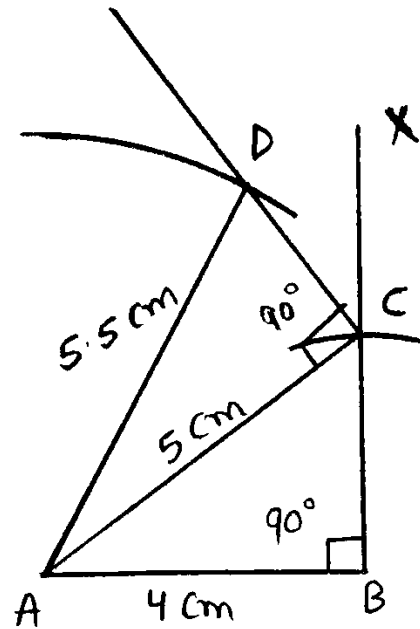
$$\Rightarrow BC = 3 \text{ cm}$$

Taking B as Centre and taking radius of 3 cm make an arc.

Step4 – Now, make an angle $\angle ACD = 90^\circ$,

Step5 – Taking A as Centre and radius of 5.5 cm, make an arc and mark at point D.

Step6 – Join AD and CD



Construction of special types of quadrilaterals

Let us understand this by examples as follows:

Examples:

Example 1 – Construct a parallelogram ABCD in which $AB = 6$ cm, $BC = 4.5$ cm and diagonal $AC = 6.8$ cm.

Solution - We know that opposite sides of parallelogram are equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 6$ cm

Step2 – Taking A as Centre and radius of 6.8 cm, draw an arc.

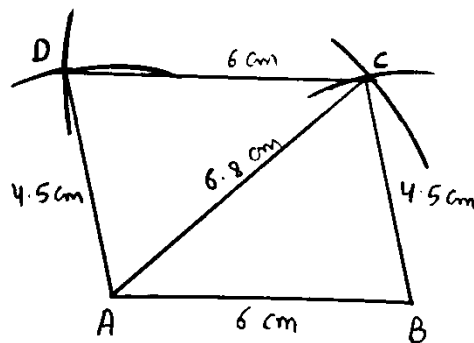
Step3 – Taking B as Centre and radius of 4.5 cm, draw another arc which cuts the previous arc at point C.

Step4 – Join AC and BC

Step5 – Taking A as Centre and radius of 4.5 cm, draw an arc.

Step6 – Taking C as Centre and radius of 6 cm, draw another arc which cuts the previous arc at D.

Step7 – Join AD and CD



Example 2 – Construct a parallelogram, one of whose sides is 5.2 cm and whose diagonals are 6 cm and 6.4 cm

Solution – We know that the diagonals of parallelogram bisect each other.

Now, AC and BC are diagonals and O is the Centre then $OA = OC$ and $OB = OD$

If $AC = 6.4$ cm and $BD = 6$ cm

Then, $OA = OC = 3.2$ cm and $OB = OD = 3$ cm

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 5.2$ cm

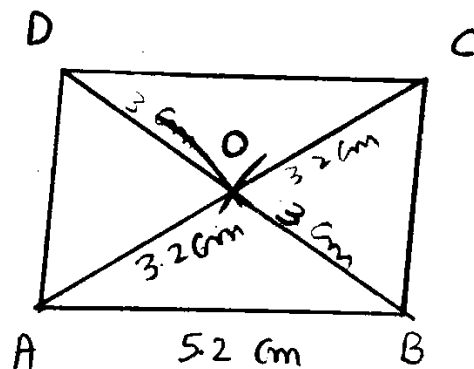
Step2 – Taking A as Centre and radius of 3.2 cm, draw an arc.

Step3 – Taking B as Centre and radius of 3 cm, draw another arc which cuts the previous arc at O.

Step4 – Join OA and OB

Step5 – Now, Extend OA to C and OB to D in such a way that $OC = OA$ and $OB = OD$

Step6 – Join AD, BC and CD



Example 3 – Construct a parallelogram whose diagonals are 5.4 cm and 6.2 cm and an angle between them is 70° .

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AC = 5.4$ cm

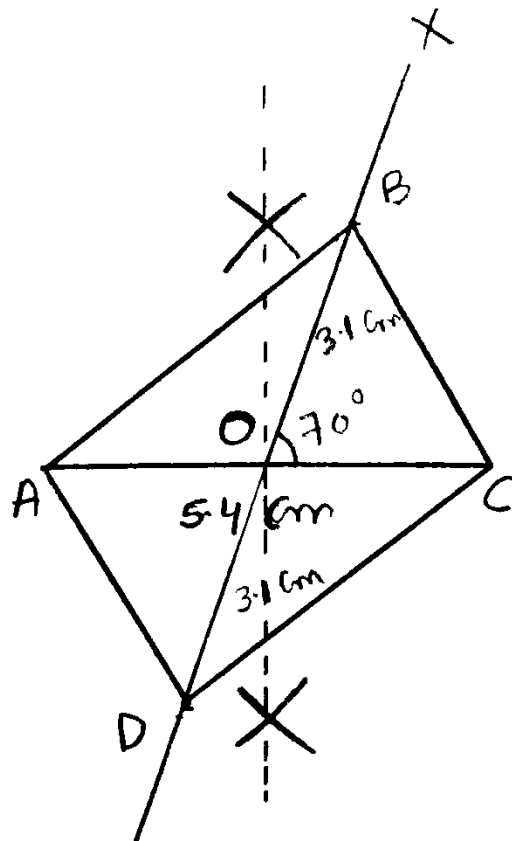
Step2 – Now, we bisect AC at O

Step3 – Make an angle $\angle COX = 70^\circ$ and extend OX to Y .

Step4 – We know that diagonals of parallelogram bisect each other. Thus, $OB = OD = 3.1$ cm

We set off $OB = 3.1$ cm and $OD = 3.1$ cm in this step.

Step5 – Join AB , BC , CD and AD



Example 4 – Construct a rectangle ABCD in which side BC = 5 cm and diagonal BD = 6.2 cm.

Solution – We know that all the angles of a rectangle are 90° and opposite sides are also equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw $BC = 5$ cm

Step2 – At C, Make CX perpendicular on BC

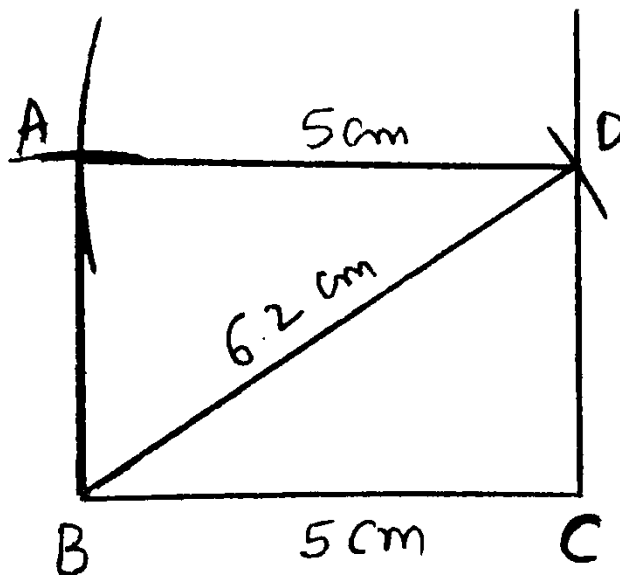
Step3 – Taking B as Centre and radius of 6.2 cm, draw an arc which cuts CX at point D

Step4 – Join BD

Step5 – Since $BC = AD$, thus taking D as Centre and radius equal to 5 cm, draw an arc.

Step6 – Since $AB = CD$, taking B as Centre and radius equal to CD, draw another arc which cuts the previous arc at point A

Step7 – Join AB and AD



Example 5 – Construct a square ABCD, each of whose diagonals is 5.2 cm

Solution – We know that the diagonals of a square bisect each other at 90° .

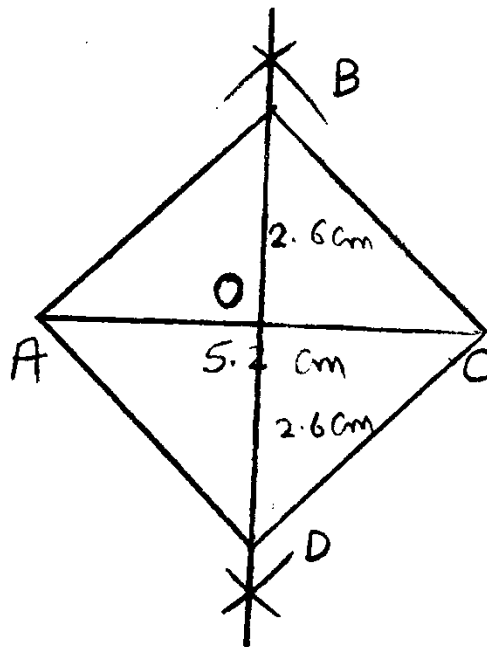
The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw $AC = 5.2$ cm

Step2 – Now, draw the right bisector XY of AC which meeting At O

Step3 – Since, $OB = OD$, Set off $OB = 2.6$ cm along OY and $OD = 2.6$ cm along OX .

Step4 – Join AB , BC , CD and AD



Example 6 – Construct a rhombus with side 4.2 cm and one of its angles equal to 65°

Solution – Since one angle of rhombus is given to be 65° thus angle adjacent to 65° is

$$(180 - 65)^\circ = 115^\circ$$

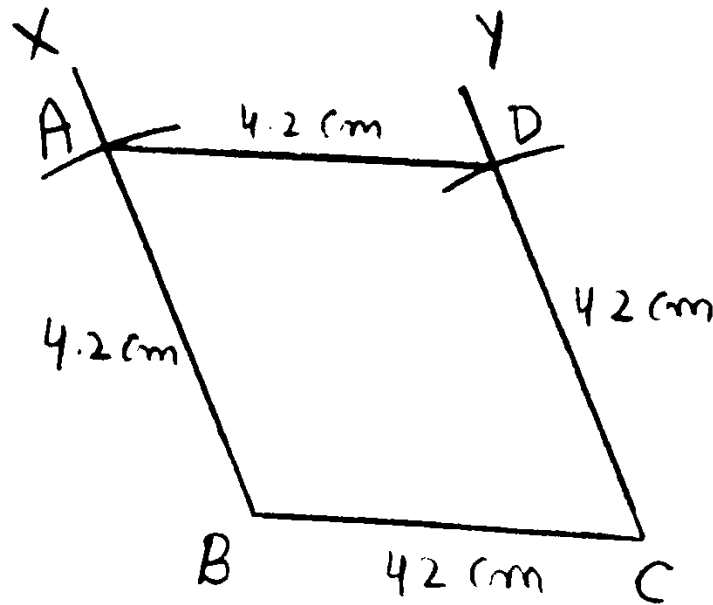
The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw a line segment $BC = 4.2$ cm

Step2 – Now, we make an angle $\angle CBX = 115^\circ$ and $\angle BCY = 65^\circ$

Step3 – Taking B as Centre and radius of 4.2 cm, draw an arc which cuts BX at point A and taking C as Centre and radius of 4.2 cm, draw another arc which cuts CY at point D.

Step4 – Join AD



Exercise 17 B

Question 1 – Construct a parallelogram ABCD in which $AB = 5.2$ cm, $BC = 4.7$ cm and $AC = 7.6$ cm

Solution - We know that opposite sides of parallelogram are equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 5.2$ cm

Step2 – Taking A as Centre and radius of 7.6 cm, draw an arc.

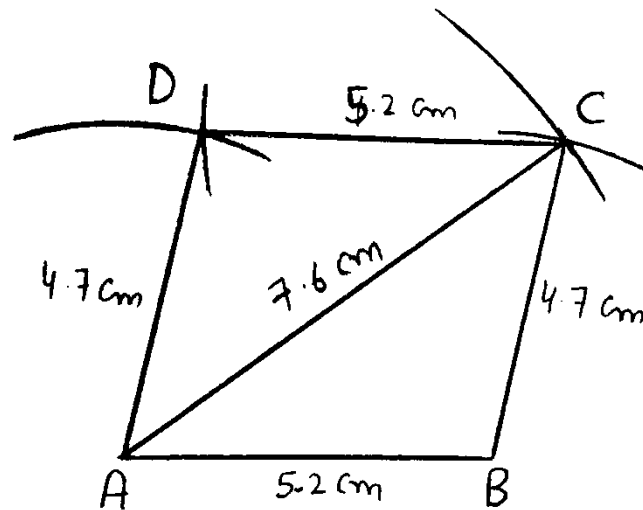
Step3 – Taking B as Centre and radius of 4.7 cm, draw another arc which cuts the previous arc at point C.

Step4 – Join AC and BC

Step5 – Taking A as Centre and radius of 4.7 cm, draw an arc.

Step6 – Taking C as Centre and radius of 5.2 cm, draw another arc which cuts the previous arc at D.

Step7 – Join AD and CD



Question 2 - Construct a parallelogram ABCD in which $AB = 4.3$ cm, $AD = 4$ cm and $BD = 6.8$ cm.

Solution - We know that opposite sides of parallelogram are equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 4.3$ cm

Step2 – Taking A as Centre and radius of 4 cm, draw an arc.

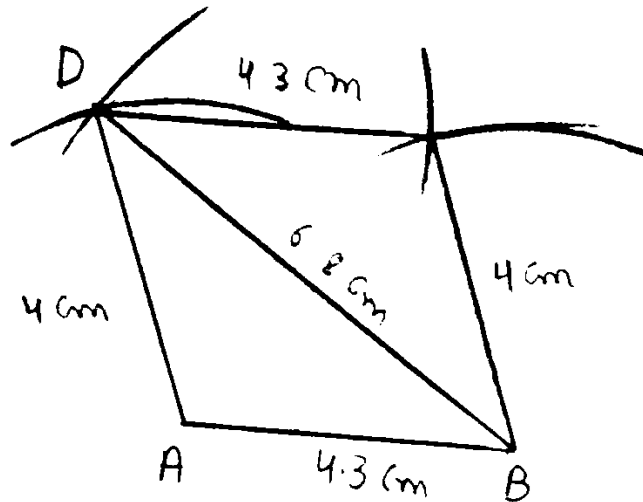
Step3 – Taking B as Centre and radius of 6.8 cm, draw another arc which cuts the previous arc at point D.

Step4 – Join AD and BD

Step5 – Taking B as Centre and radius of 4 cm, draw an arc.

Step6 – Taking D as Centre and radius of 4.3 cm, draw another arc which cuts the previous arc at C.

Step7 – Join CD and CB



Question 3 – Construct a parallelogram PQRS in which QR = 6 cm, PQ = 4 cm and $\angle PQR = 60^\circ$

Solution – We know that opposite sides of parallelogram are equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment PQ = 4 cm

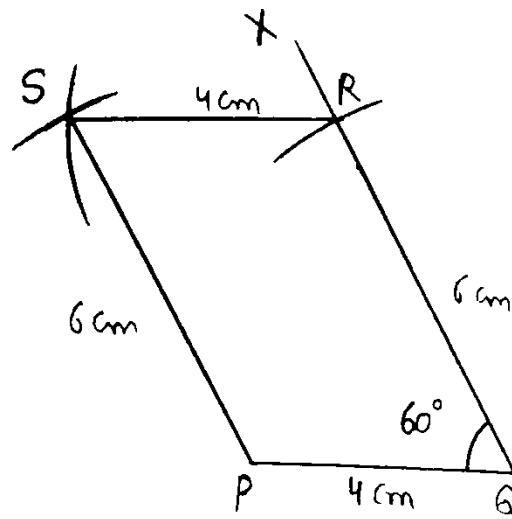
Step2 – Make an angle $\angle PQX = 60^\circ$

Step3 – Taking Q as Centre and radius of 6 cm, draw an arc which cuts QX at R

Step4 – Taking R as Centre and radius of 4 cm, draw an arc.

Step5 – Taking P as Centre and radius of 6 cm, draw another arc which cuts the previous arc at point S.

Step6 – Join PS and SR



Question 4 – Construct a parallelogram ABCD in which $BC = 5$ cm, $\angle BCD = 120^\circ$ and $CD = 4.8$ cm

Solution – We know that opposite sides of parallelogram are equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $BC = 5$ cm

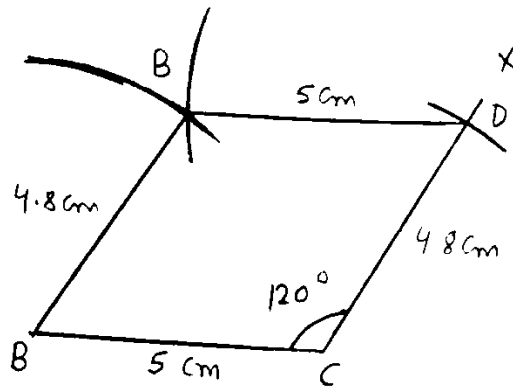
Step2 – Make an angle $\angle BCX = 120^\circ$

Step3 – Taking C as Centre and radius of 4.8 cm, draw an arc which cuts CX at D

Step4 – Taking D as Centre and radius of 5 cm, draw an arc.

Step5 – Taking B as Centre and radius of 4.8 cm, draw another arc which cuts the previous arc at point A.

Step6 – Join AB and AD



Question 5 – Construct a parallelogram, one of whose sides is 4.4 cm and whose diagonals are 5.6 cm and 7 cm. Measure the other side.

Solution – We know that the diagonals of parallelogram bisect each other.

Now, AC and BC are diagonals and O is the Centre then $OA = OC$ and $OB = OD$

If $AC = 5.6$ cm and $BD = 7$ cm

Then, $OA = OC = 2.8$ cm and $OB = OD = 3.5$ cm

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 4.4$ cm

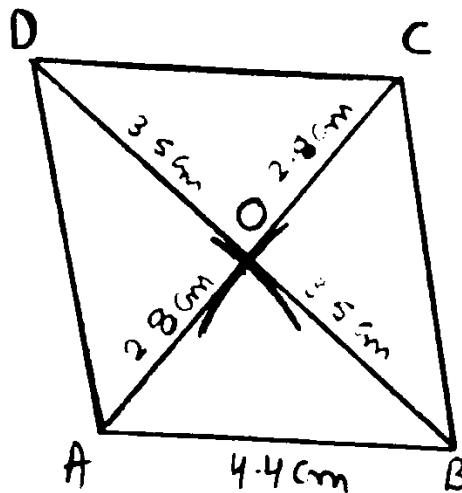
Step2 – Taking A as Centre and radius of 2.8 cm, draw an arc.

Step3 – Taking B as Centre and radius of 3.5 cm, draw another arc which cuts the previous arc at O.

Step4 – Join OA and OB

Step5 – Now, Extend OA to C and OB to D in such a way that $OC = OA$ and $OB = OD$

Step6 – Join AD, BC and CD



Question 6 – Construct a parallelogram ABCD in which AB = 6.5 cm, AC = 3.4 cm and the altitude AL from A is 2.5 cm. Draw the altitude from C and measure it.

Solution – We know that the diagonals of parallelogram bisect each other.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw a line segment AB = 6.5 cm

Step2 – Now, we draw AE perpendicular on AB

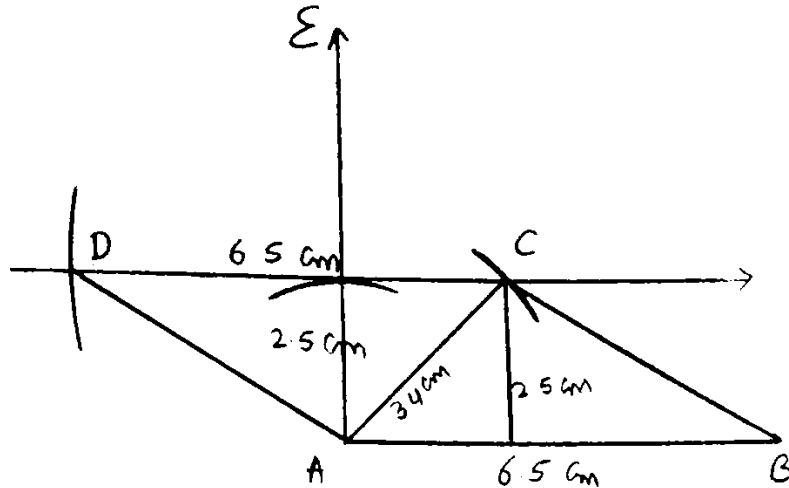
Step3 – Taking A as Centre and radius of 2.5 cm, draw an arc which cuts AE at L.

Step4 – Draw a line parallel to AB which is passing through L.

Step5 – Taking A as Centre and radius of 3.4 cm, draw an arc which cuts the line AB at point C

Step6 – Taking C as Centre and radius of 6.5 cm, draw an arc which cuts the line segment CF at D.

Step7 – Join AD and CD



Question 7 – Construct a parallelogram ABCD, in which diagonal AC = 3.8 cm, diagonal BD = 4.6 cm and the angle between AC and BD is 60°.

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment AC = 3.8 cm

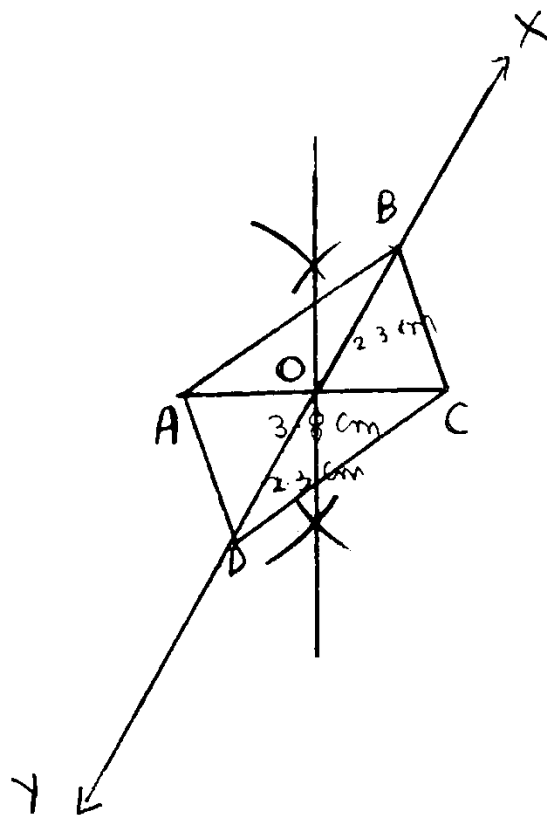
Step2 – Now, we bisect AC at O

Step3 – Make an angle $\angle COX = 60^\circ$ and extend OX to Y.

Step4 – We know that diagonals of parallelogram bisect each other. Thus, $OB = OD = 2.3$ cm

We set off $OB = 2.3$ cm and $OD = 2.3$ cm in this step.

Step5 – Join AB, BC, CD and AD



Question 8 – Construct a rectangle ABCD whose adjacent sides are 11 cm and 8.5 cm.

Solution – We know that all the angles of a rectangle are 90° and opposite sides are also equal

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw $AB = 11$ cm

Step2 – At B, Make BX perpendicular on AB

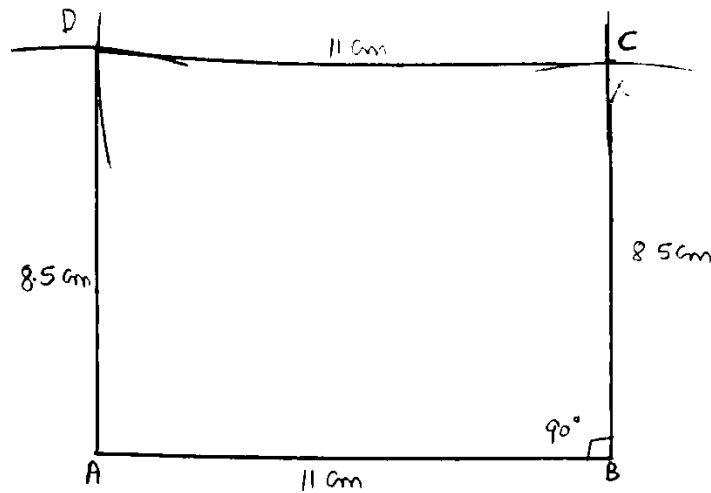
Step3 – Taking B as Centre and radius of 8.5 cm, draw an arc which cuts BX at point C

Step4 – Join BC

Step5 – Since $DC = AB$, thus taking C as Centre and radius equal to 11 cm, draw an arc.

Step6 – Since $AD = CB$, taking A as Centre and radius equal to $BC = 8.5$ cm, draw another arc which cuts the previous arc at point D

Step7 – Join CD and AD



Question 9 – Construct a square, each of whose sides measures 6.4 cm.

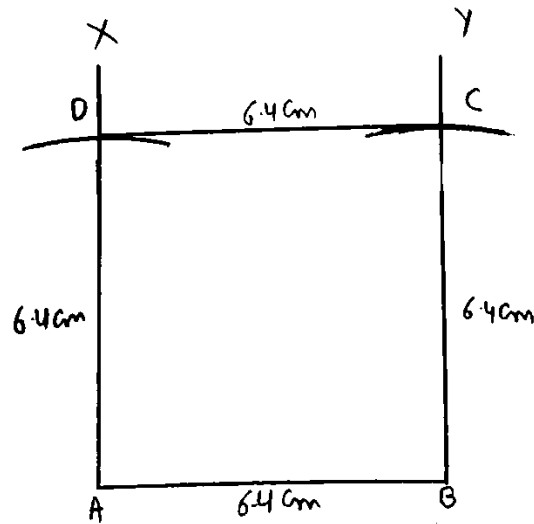
Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw $AB = 6.4$ cm

Step2 – At A, Make AX perpendicular on AB and at B, Make BY perpendicular on AB

Step3 – Taking A as Centre and radius of 6.4 cm, draw an arc which cuts AX at D and taking B as Centre and radius of 6.4 cm, draw an arc which cuts BY at C.

Step4 – Join AD, BC and CD



Question 10 – Construct a square, each of whose diagonals measures 5.8 cm.

Solution – We know that the diagonals of a square bisect each other at 90° .

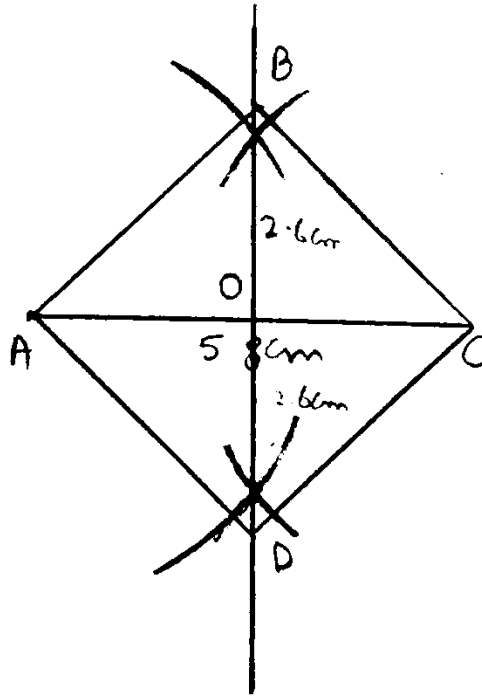
The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw $AC = 5.8$ cm

Step2 – Now, draw the right bisector XY of AC which meeting At O

Step3 – Since, $OB = OD$, Set off $OB = 2.8$ cm along OY and $OD = 2.6$ cm along OX .

Step4 – Join AB , BC , CD and AD



Question 11 – Construct a rectangle PQRS in which QR = 3.6 cm and diagonal PR = 6 cm. Measure the other side of the rectangle.

Solution – We know that all the angles of a rectangle are 90° and opposite sides are also equal.

The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw QR = 3.6 cm

Step2 – At Q, Make QX perpendicular on QR

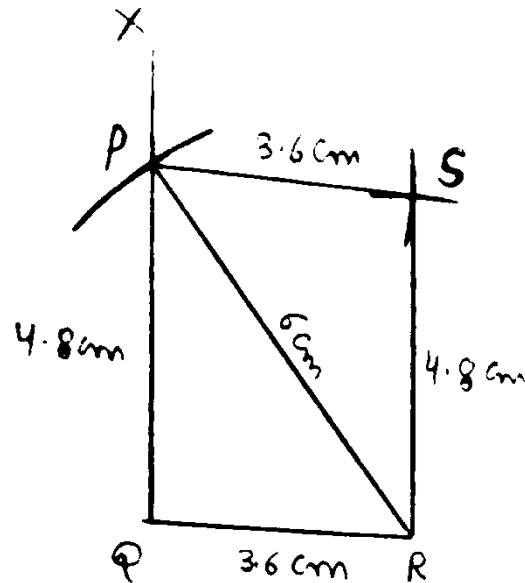
Step3 – Taking R as Centre and radius of 6 cm, draw an arc which cuts QX at point P

Step4 – Join PQ and PR

Step5 – Since PS = QR, thus taking P as Centre and radius equal to 3.6 cm, draw an arc.

Step6 – Since PQ = SR, taking R as Centre and radius equal to PQ, draw another arc which cuts the previous arc at point S

Step7 – Join PS and RS



Question 12 – Construct a rhombus the lengths of whose diagonals are 6 cm and 8 cm.

Solution – We know that diagonals of rhombus bisect each other at right angle.

If $AC = 8$ cm and $BD = 6$ cm then $OA = OC = 4$ cm and $OB = OD = 3$ cm

Also, all the sides of rhombus are equal.

The steps for the construction of this quadrilateral are as follows:

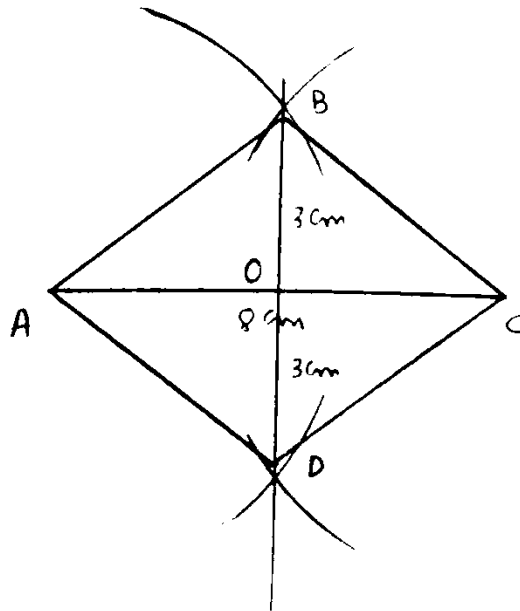
Step1 – First, we draw a line segment $AC = 8$ cm

Step2 – Make perpendicular bisector XY of AC which bisects at point O

Step3 – Since $OB = OD = 3$ cm

We set off $OB = 3$ cm and $OD = 3$ cm in this step.

Step5 – Join AB, BC, CD and AD



Question 13 – Construct a rhombus ABCD in which $AB = 4$ cm and diagonal AC is 6.5 cm

Solution –The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw line segment $AB = 4$ cm

Step2 – Taking B as Centre and radius of 4 cm, draw an arc.

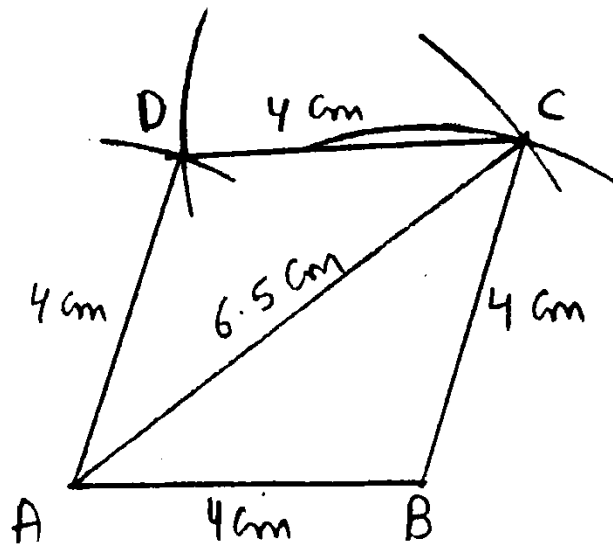
Step3 – Taking A as Centre and radius of 6.5 cm, draw another arc which cuts the previous arc at point C

Step4 – Join AC and BC

Step5 – Taking C as Centre and radius of 4 cm, draw an arc

Step6 – Taking A as Centre and radius of 4 cm, draw another arc which cuts the previous arc at point D

Step7 – Join AD and CD



Question 14 – Draw a rhombus whose side is 7.2 cm and one angle is 60°

Solution – Since one angle of rhombus is given to be 60° thus angle adjacent to 60° is

$$(180 - 60)^\circ = 120^\circ$$

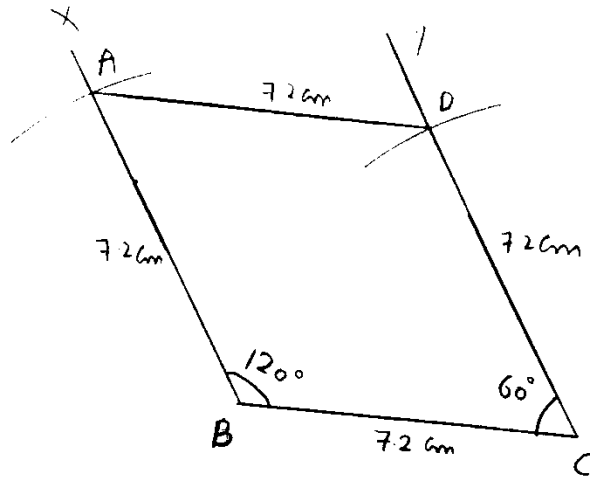
The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw a line segment $BC = 7.2$ cm

Step2 – Now, we make an angle $\angle CBX = 120^\circ$ and $\angle BCY = 60^\circ$

Step3 – Taking B as Centre and radius of 7.2 cm, draw an arc which cuts BX at point A and taking C as Centre and radius of 7.2 cm, draw another arc which cuts CY at point D.

Step4 – Join AD



Question 15 – Construct a trapezium ABCD in which $AB = 6\text{ cm}$, $BC = 4\text{ cm}$, $CD = 3.2\text{ cm}$ and $\angle B = 75^\circ$ and $DC \parallel AB$

Solution – The Steps of construction of this quadrilateral are as follows:

Step1 – First, we draw $AB = 6\text{ cm}$

Step2 – Make an angle $\angle ABX = 75^\circ$

Step3 – Taking B as Centre and radius of 4 cm, draw an arc which cuts BX at point C

Step4 – Now, Since $DC \parallel AB$

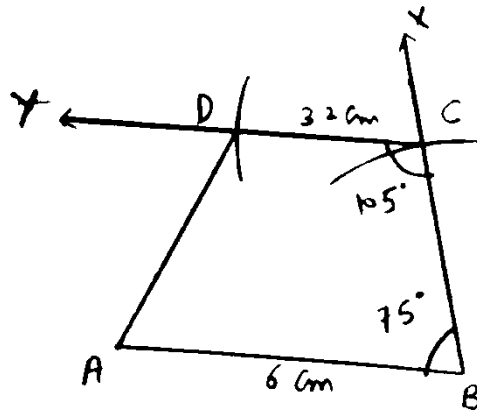
$\angle ABX + \angle BCY = 180^\circ$ (sum of adjacent angles in a parallelogram is 180°)

$\angle BCY = 180 - 75 = 105^\circ$

Make an angle $\angle BCY = 105^\circ$

Step5 – Taking C as Centre and radius of 3.2 cm, draw an arc which cuts CY at D

Step6 – Join AD



Question 16 – Draw a trapezium ABCD in which $AB \parallel DC$, $AB = 7$ cm, $BC = 5$ cm, $AD = 6.5$ cm and $\angle B = 60^\circ$

Solution – The steps for the construction of this quadrilateral are as follows:

Step1 – First, we draw a line segment $AB = 7$ cm

Step2 – Make an angle $\angle ABX = 60^\circ$

Step3 – Taking B as Centre and radius of 5 cm, draw an arc which cuts BX at point C

Step4 - Now, Since $AB \parallel DC$

$\angle ABX + \angle BCY = 180^\circ$ (sum of adjacent angles in a parallelogram is 180°)

$\angle BCY = 180 - 60 = 120^\circ$

Make an angle $\angle BCY = 120^\circ$

Step5 – Taking A as Centre and radius of 6.5 cm, draw an arc which cuts CY at point D

Step6 – Join AD

