

EXERCISE 14.1

1. Construct a quadrilateral PQRS where $PQ = 4.5$ cm, $QR = 6$ cm, $RS = 5.5$ cm, $PS = 5$ cm and $PR = 6.5$ cm.

Solution:

Steps of Construction:

(i) Construct a line segment $PR = 6.5$ cm.

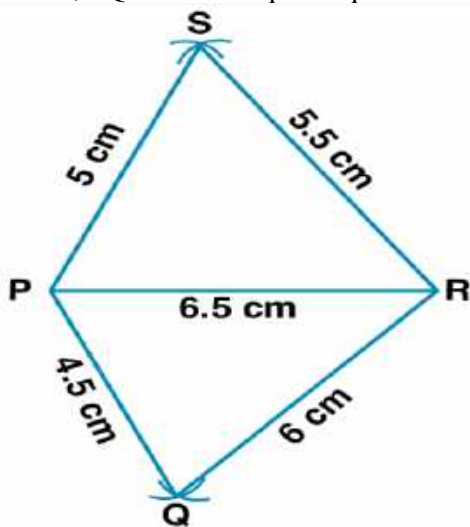
(ii) Taking P as centre and 4.5 cm radius and R as centre and 6 cm radius construct arcs which intersect each other at Q.

(iii) Now join PQ and QR.

(iv) Taking P as centre and 5 cm radius and R as centre and 5.5 cm radius, construct arcs which intersect each other at S.

(v) Join PS and SR.

Hence, PQRS is the required quadrilateral.



2. Construct a quadrilateral ABCD in which $AB = 3.5$ cm, $BC = 5$ cm, $CD = 5.6$ cm, $DA = 4$ cm, $BD = 5.4$ cm.

Solution:

Steps of Construction:

(i) Construct a line segment $AB = 3.5$ cm.

(ii) Taking A as centre and 4 cm radius construct an arc and with B as centre and 5.4 cm construct an arc which meets the previous arc at the point D.

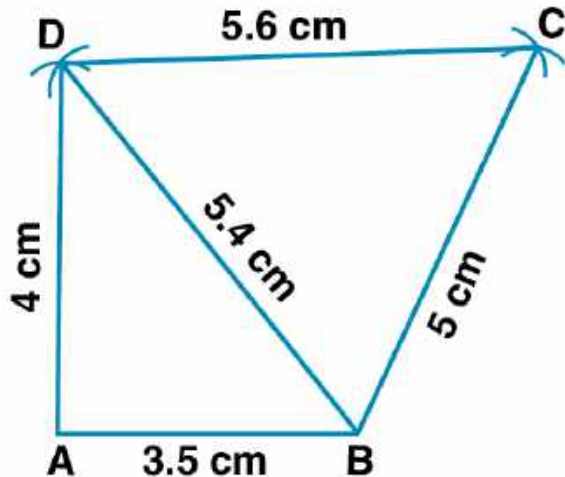
Now join AD and BD.

(iii) Taking B as centre and 5 cm radius, construct an arc

Taking D as centre and 5.6 cm radius, construct an arc which meets the previous arc at the point C.

(iv) Join BC and CD.

Hence, ABCD is the required quadrilateral.



3. Construct a quadrilateral PQRS in which $PQ = 3$ cm, $QR = 2.5$ cm, $PS = 3.5$ cm, $PR = 4$ cm and $QS = 5$ cm.

Solution:

Steps of Construction:

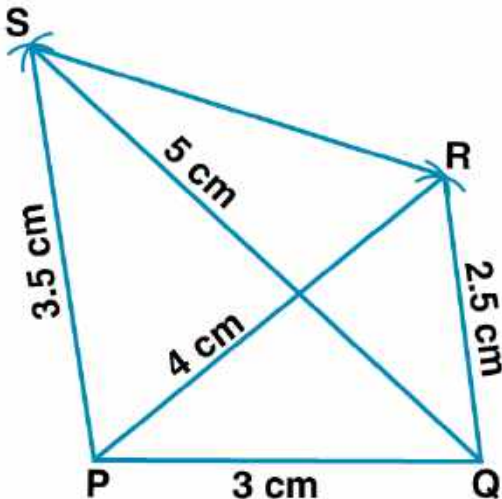
(i) Construct $PQ = 3$ cm.

(ii) Taking P as centre and 4 cm radius, construct an arc
Taking Q as centre and 2.5 cm radius, construct an arc which meets the previous arc at R
Now join PQ and QR

(iii) Taking P as centre and 3.5 cm radius, construct an arc
Taking Q as centre and 5 cm radius, construct an arc which meets the previous arc at S.

(iv) Join PS, QS and SR.

Therefore, PQRS is the required quadrilateral.



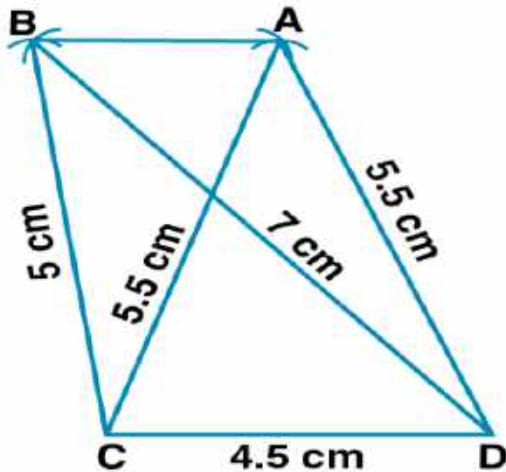
4. Construct a quadrilateral ABCD such that $BC = 5$ cm, $AD = 5.5$ cm, $CD = 4.5$ cm, $AC = 7$ cm and $BC = 5.5$ cm.

Solution:

Steps of Construction:

(i) Construct a line segment $CD = 4.5$ cm.

- (ii) Taking C as centre and 5.5 cm radius and taking D as centre and 7 cm radius construct arcs which intersect each other at B.
- (iii) Join BC and BD.
- (iv) Taking C as centre and 5.5 cm radius and taking D as centre and 5.5 cm radius, construct arcs which intersect each other at A.
- (v) Now join AC and AD.
- (vi) Join AB.
- Therefore, ABCD is the required quadrilateral.

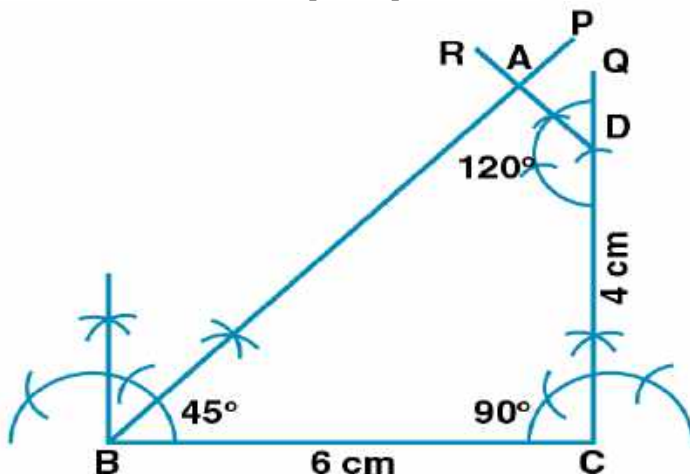


- 5. Construct a quadrilateral ABCD given that $BC = 6$ cm, $CD = 4$ cm, $\angle B = 45^\circ$, $\angle C = 90^\circ$ and $\angle D = 120^\circ$.**
Solution:

Steps of Construction:

- (i) Construct $BC = 6$ cm.
- (ii) At the point B, draw $\angle CBP = 45^\circ$.
- (iii) At the point C, draw $\angle BCQ = 90^\circ$.
- (iv) Cut off $CD = 4$ cm from CQ .
- (v) At the point D, draw $\angle CDR = 120^\circ$.
- (iv) Let BP and DR meet at the point A.

Therefore, ABCD is the required quadrilateral.



- 6. Construct a quadrilateral PQRS where $PQ = 4$ cm, $QR = 6$ cm, $\angle P = 60^\circ$, $\angle Q = 90^\circ$ and $\angle R = 120^\circ$.**

Solution:

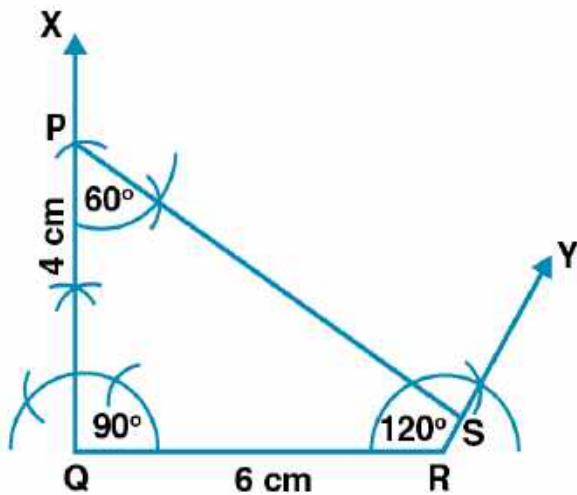
Steps of Construction:

(i) Construct a line segment $QR = 6$ cm.

(ii) At the point Q, construct a ray QX making an angle of 90° and cut off $QP = 4$ cm.

(iii) At the point P, construct a ray making an angle of 60° and at R, a ray making an angle 120° which meets each other at the point S.

Therefore, PQRS is the required quadrilateral.



7. Construct a quadrilateral ABCD such that $AB = 5$ cm, $BC = 4.2$ cm, $AD = 3.5$ cm, $\angle A = 90^\circ$ and $\angle B = 60^\circ$.

Solution:

Steps of Construction:

(i) Construct $AB = 5$ cm.

(ii) At the point A, construct $\angle A = 90^\circ$.

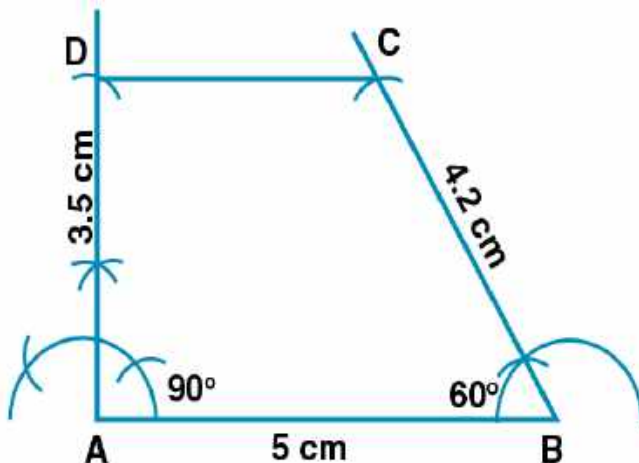
(iii) At the point B, construct $\angle B = 60^\circ$.

(iv) Taking B as centre and radius 4.2 cm cut off $\angle B$ at C.

(v) Taking A as centre and radius 3.5 cm cut off $\angle A$ at D.

(vi) Now join CD.

Therefore, ABCD is the required quadrilateral.



8. Construct a quadrilateral PQRS where $PQ = 4$ cm, $QR = 5$ cm, $RS = 4.5$ cm, $\angle Q = 60^\circ$ and $\angle R = 90^\circ$.

Solution:

Steps of Construction:

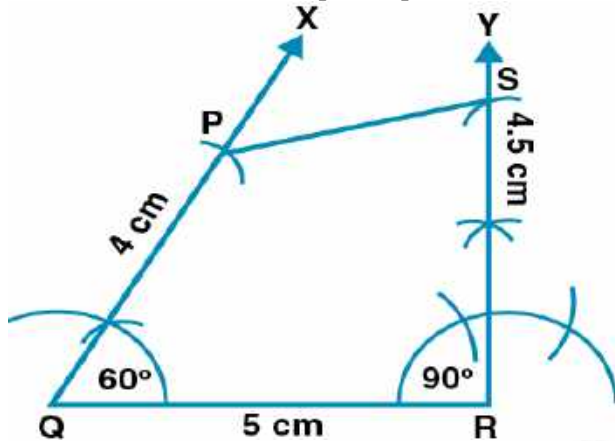
(i) Construct a line segment $QR = 5$ cm.

(ii) At the point Q, construct a ray QX making an angle of 60° and cut off $QP = 4$ cm.

(iii) At the point R, construct a ray RY making an angle of 90° and cut off $RS = 4.5$ cm.

(iv) Now join PS.

Therefore, PQRS is the required quadrilateral.



9. Construct a quadrilateral BEST where $BE = 3.8$ cm, $ES = 3.4$ cm, $ST = 4.5$ cm, $TB = 5$ cm and $\angle E = 80^\circ$.

Solution:

Steps of Construction:

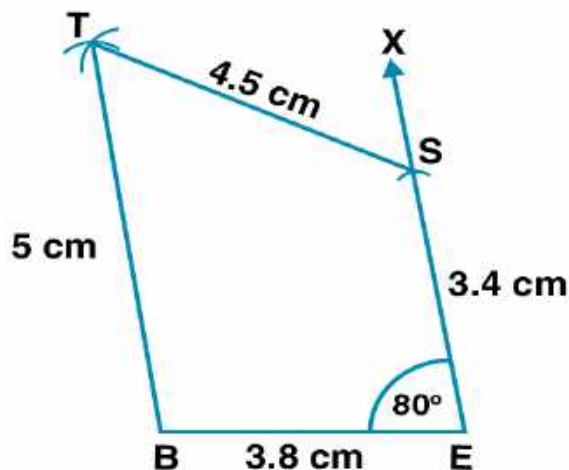
(i) Construct a line segment $BE = 3.8$ cm.

(ii) At the point E, construct a ray EX making an angle of 80° and cut off $ES = 3.4$ cm.

(iii) Taking B as centre and 5 cm radius and S as centre and 4.5 cm radius, construct arcs which intersect each other at T.

(iv) Now join TB and TS.

Therefore, BEST is the required quadrilateral.

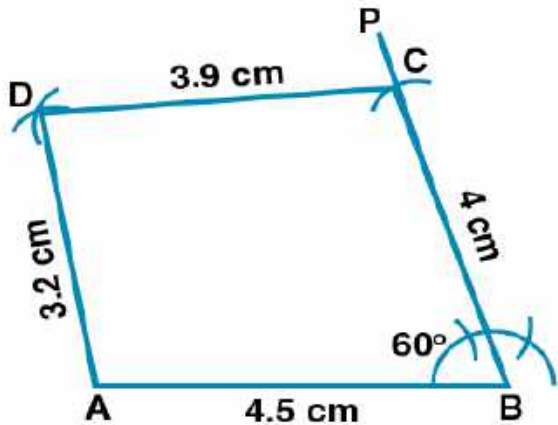


10. Construct a quadrilateral ABCD where $AB = 4.5$ cm, $BC = 4$ cm, $CD = 3.9$ cm, $AD = 3.2$ cm and $\angle B = 60^\circ$.

Solution:

Steps of Construction:

- (i) Construct $AB = 4.5$ cm.
- (ii) At point B, construct $\angle ABP = 60^\circ$.
- (iii) Cut off $BC = 4$ cm from BP.
- (iv) Taking C as centre and radius 3.9 cm construct an arc.
- (v) Taking A as centre and radius 3.2 cm construct an arc which meets the previous arc at D.
- (vi) Now join AD and CD.



EXERCISE 14.2

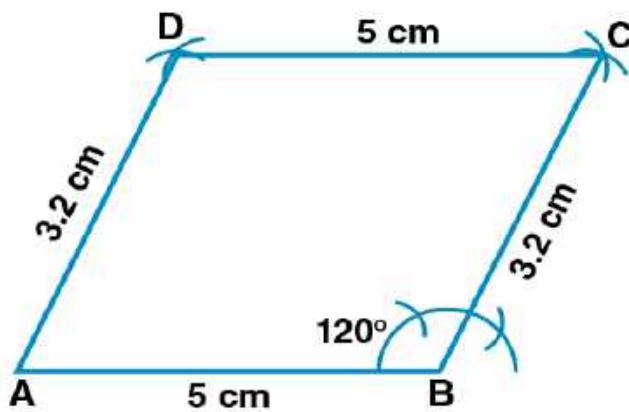
1. Construct a parallelogram ABCD such that $AB = 5 \text{ cm}$, $BC = 3.2 \text{ cm}$ and $\angle B = 120^\circ$.

Solution:

Steps of Construction:

- (i) Construct $AB = 5 \text{ cm}$.
- (ii) At point B, draw angle 120° .
- (iii) Taking B as centre and radius 3.2 cm cut off $\angle B$ at C.
- (iv) Taking C as centre and radius AB construct an arc.
- (v) Taking A as centre and radius 3.2 cm , construct an arc which meets the previous arc at D.
- (vi) Now join AD and CD.

Therefore, ABCD is the required parallelogram.



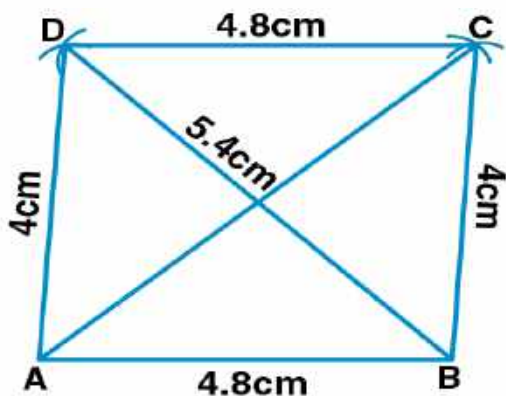
2. Construct a parallelogram ABCD such that $AB = 4.8 \text{ cm}$, $BC = 4 \text{ cm}$ and diagonal $BD = 5.4 \text{ cm}$.

Solution:

Steps of Construction:

- (i) Draw a triangle ABCD.
- (ii) Taking B as centre and radius 4 cm , construct an arc.
- (iii) Taking D as centre and radius 4.8 cm , construct an arc which meets the previous arc at C.
- (iv) Now join CD, BC and AC.

Therefore, ABCD is the required parallelogram.



3. Construct a parallelogram ABCD such that $BC = 4.5$ cm, $BD = 4$ cm and $AC = 5.6$ cm.

Solution:

Steps of Construction:

(i) Draw a triangle BOC with $BC = 4.5$ cm

Here

$$BO = \frac{1}{2} \times 4 = 2 \text{ cm}$$

$$OC = \frac{1}{2} AC$$

$$= \frac{1}{2} \times 5.6$$

$$= 2.8 \text{ cm}$$

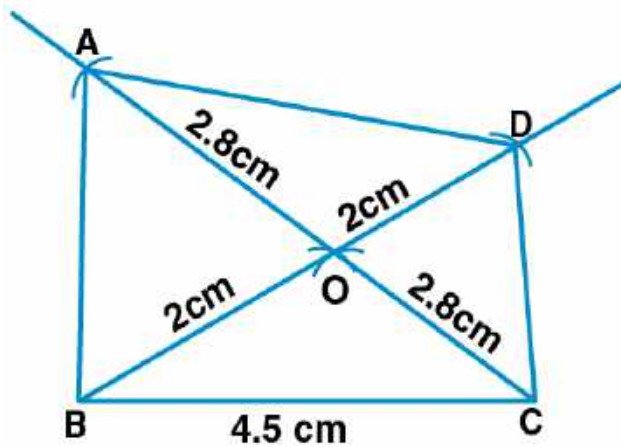
We know that the diagonals of parallelogram bisect each other.

(ii) Produce OC to point A such that $OC = OA$.

(iii) Produce BO to point D such that $OD = OB$.

(iv) Now join AD.

Therefore, ABCD is the required parallelogram.



4. Construct a parallelogram ABCD such that $AC = 6$ cm, $BD = 4.6$ cm and angle between them is 45° .

Solution:

Steps of Construction:

(i) Construct $AO = \frac{1}{2} AC = 3$ cm and produce AO to C such that $OC = OA$.

(ii) At the point O, draw $\angle COP = 45^\circ$.

(iii) From OP

$$\text{Cut } OD = \frac{1}{2} BD$$

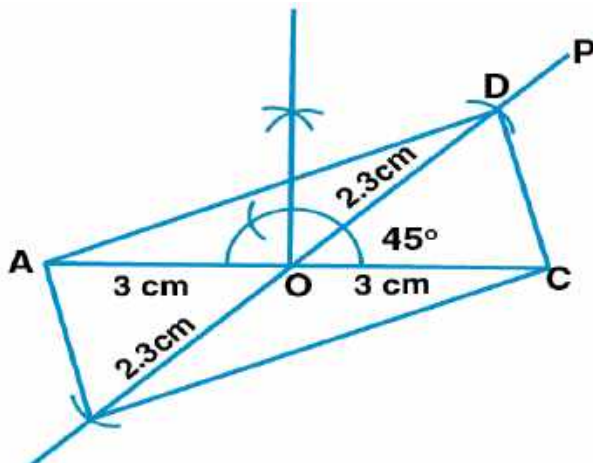
$$= \frac{1}{2} \times 4.6$$

$$= 2.3 \text{ cm}$$

(iv) Produce OD to OB such that $OB = OD$.

(v) Now join AB, BC, CD and DA.

Therefore, ABCD is the required parallelogram.



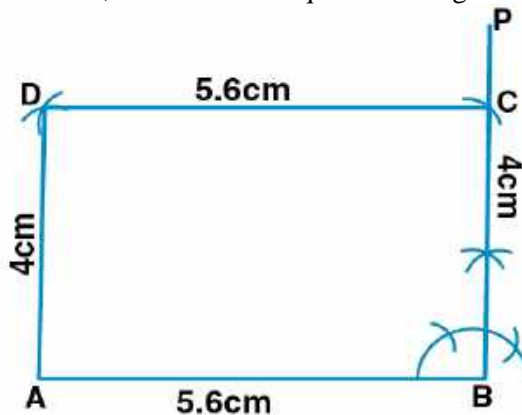
5. Construct a rectangle whose adjacent sides are 5.6 cm and 4 cm.

Solution:

Steps of Construction:

- (i) Construct $AB = 5.6$ cm.
- (ii) At the point B, draw $\angle ABP = 90^\circ$.
- (iii) Cut off $BC = 4$ cm from BP.
- (iv) Taking C as centre and 5.6 cm radius, construct an arc.
- (v) Taking A as centre and 4 cm radius, construct an arc which meets the previous arc at point D.
- (vi) Now join AD and CD.

Therefore, ABCD is the required rectangle.



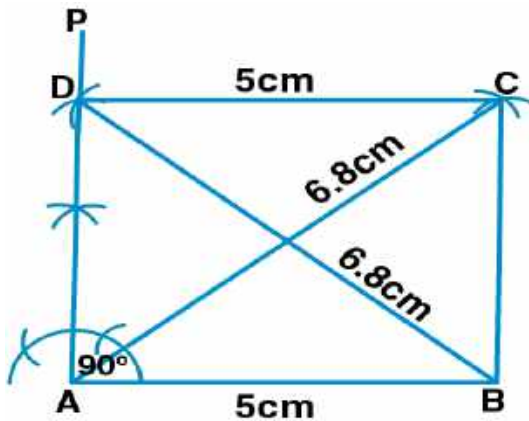
6. Construct a rectangle such that one side is 5 cm and one diagonal is 6.8 cm.

Solution:

Steps of Construction:

- (i) Construct $AB = 5$ cm.
- (ii) At the point A, draw $\angle BAP = 90^\circ$.
- (iii) Taking B as centre and 6.8 cm radius, construct an arc which meets AP at D.
- (iv) Taking A as centre and 6.8 cm radius, construct an arc.
- (v) Taking D as centre and 5 cm radius, construct an arc which meets the previous arc at C.
- (vi) Now join BC and CD.

Therefore, ABCD is the required rectangle.



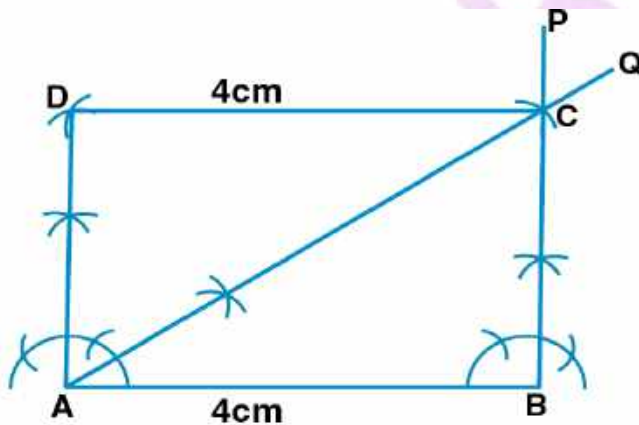
7. Construct a rectangle ABCD such that $AB = 4$ cm and $\angle BAC = 60^\circ$.

Solution:

Steps of Construction:

- (i) Construct $AB = 4$ cm.
- (ii) At the point B, construct $\angle ABP = 90^\circ$.
- (iii) At the point A, draw $\angle BAQ = 30^\circ$. Let AQ meet BP at the point D.
- (iv) Taking D as centre and 4 cm radius construct an arc.
- (v) Taking A as centre and BD as radius, construct an arc which meets the previous arc at the point C.
- (vi) Now join AC and CD.

Therefore, ABCD is the required rectangle.



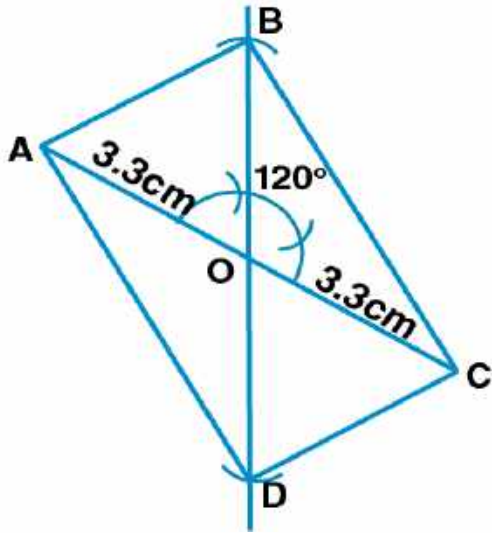
8. Construct a rectangle such that one diagonal is 6.6 cm and angle between two diagonals is 120° .

Solution:

Steps of Construction:

- (i) Construct $AO = \frac{1}{2} AC = (\frac{1}{2} \times 6.6)$ cm and produce AO to C such that $OC = OA = 3.3$ cm.
- (ii) At the point O, draw $\angle COB = 120^\circ$.
- (iii) Cut off $OB = \frac{1}{2} AC = 3.3$ cm from OB.
- (iv) Produce BO to D such that $OB = OD = 3.3$ cm.
- (v) Now join AB, BC, CD and DA.

Therefore, ABCD is the required rectangle.



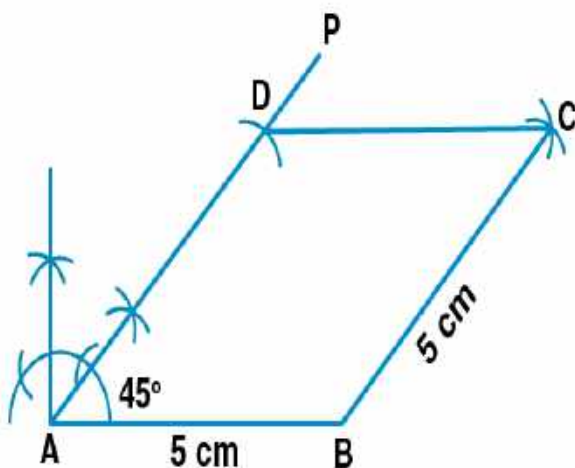
9. Construct a rhombus whose one side is 5 cm and one angle is 45° .

Solution:

Steps of Construction:

- (i) Construct $AB = 5$ cm.
- (ii) At the point A, draw $\angle BAP = 45^\circ$.
- (iii) Cut off $AD = 5$ cm from AP.
- (iv) Taking B as centre and 5 cm radius, construct an arc.
- (v) Taking D as centre and 5 cm radius, construct an arc which meets the previous arc at the point C.
- (vi) Now join BC and CD.

Therefore, ABCD is the required rhombus.



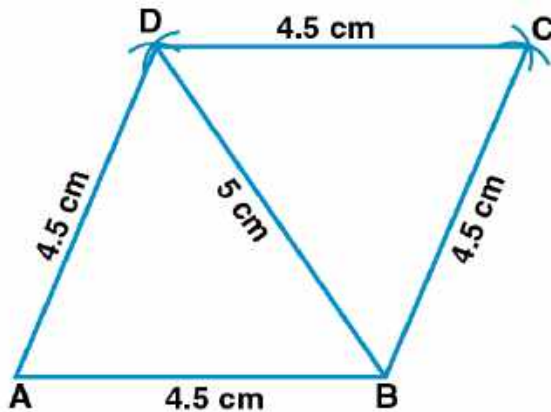
10. Construct a rhombus whose one side is 4.5 cm and one diagonal is 5 cm.

Solution:

Steps of Construction:

- (i) Construct $AB = 4.5$ cm.
- (ii) Taking A as centre and 4.5 cm radius, construct an arc.

- (iii) Taking B as centre and 5 cm radius, construct an arc which meets the previous arc at D.
 (iv) Taking B as centre and 4.5 cm radius, construct an arc.
 (v) Taking D as centre and 4.5 cm radius, construct an arc which meets the previous arc at point C.
 (vi) Now join AD, BC and CD.
 Therefore, ABCD is the required rhombus.



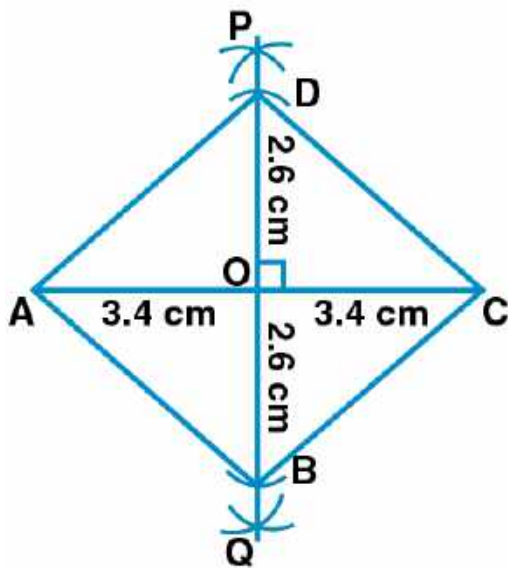
11. Construct a rhombus whose diagonals are 6.8 cm and 5.2 cm.

Solution:

Steps of Construction:

- (i) Construct AC = 6.8 cm.
 (ii) Construct one bisector PQ of AC to meet it at the point O.
 (iii) From POQ, cut off OB and OD such that
 $OB = OD = \frac{1}{2} BD = \frac{1}{2} \times 5.2 = 2.6$ cm
 (iv) Now join AB, BC, CD and DA.

Therefore, ABCD is the required rhombus.



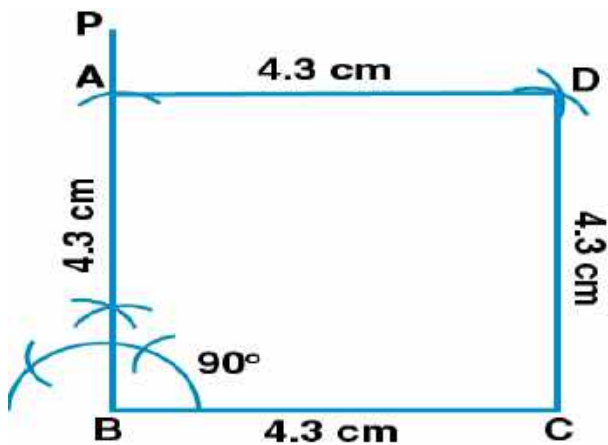
12. Construct a square whose one side is 4.3 cm.

Solution:

Steps of Construction:

- (i) Construct $BC = 4.3$ cm.
- (ii) At the point B, draw $\angle CBP = 90^\circ$.
- (iii) Cut off $BA = 4.3$ cm from BP.
- (iv) Taking C as centre and 4.3 cm radius, construct an arc.
- (v) Taking A as centre and 4.3 cm radius, construct an arc which meets the previous arc at D.
- (vi) Now join AD and CD.

Therefore, ABCD is the required square.



13. Construct a square whose one diagonal is 6.2 cm.

Solution:

Steps of Construction:

- (i) Construct $AC = 6.2$ cm.
- (ii) Construct a perpendicular bisector PQ of AC to meet it at point O.
- (iii) From POQ, cut off $OB = OD = \frac{1}{2} AC = 3.1$ cm.
- (iv) Now join AB, BC, CD and DA.

Therefore, ABCD is the required square.

