

**EXERCISE 18.1**

**PAGE NO: 18.4**

**1. Construct a quadrilateral ABCD in which AB = 4.4 cm, BC = 4 cm, CD = 6.4 cm, DA = 3.8 cm and BD = 6.6 cm.**

**Solution:**

The given details are AB = 4.4 cm, BC = 4 cm, CD = 6.4 cm, DA = 3.8 cm and BD = 6.6 cm.

Divide the quadrilateral into two triangles i.e.,  $\triangle ABD$  and  $\triangle BCD$

Steps to construct a quadrilateral:

Step 1- By using SSS congruency rule, Draw line BD of length 6.6 cm.

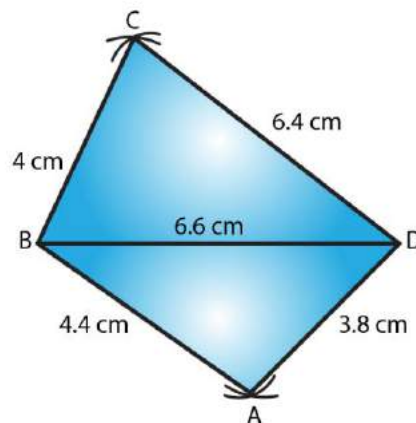
Step 2- Cut an arc with B as the centre and radius BC = 4cm. Do the same by taking D as centre and radius CD = 6.4 cm.

Step 3- Now join the intersection point from B and D and label it as C.

Step 4- Now for vertex A, cut an arc by taking B as the center and radius BA = 4.4cm.

Do the same by taking D as center and radius DA = 3.8cm.

Step 5- Join the intersection point from B and D and label it as A.



**2. Construct a quadrilateral ABCD in which AB = BC = 5.5 cm, CD = 4 cm, DA = 6.3 cm, AC = 9.4 cm Measure BD.**

**Solution:**

The given details are AB = BC = 5.5 cm, CD = 4 cm, DA = 6.3 cm, AC = 9.4 cm Measure BD.

Steps to construct a quadrilateral:

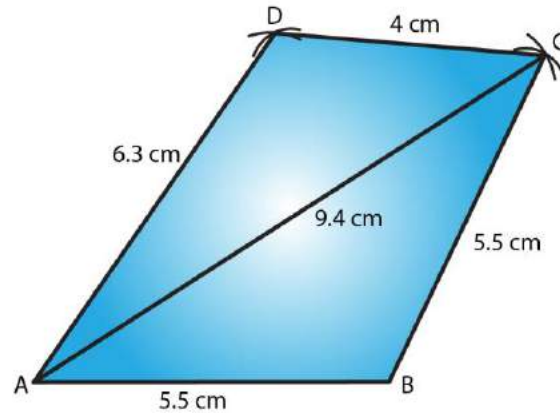
Step 1- Draw a line segment AB = 5.5cm

Step 2- With B as center and radius BC = 5.5cm cut an arc. Mark that point as C.

Step 3- With A as center and radius AC = 9.4cm cut an arc to intersect at point C.

Step 4- With C as center and radius CD = 4cm cut an arc. Mark that point as D.

Step 5- With A as center and radius  $AD = 6.3\text{cm}$  cut an arc to intersect at point D.  
Step 6- Now join BC, CD and AD  
Measure of BD is  $5.1\text{cm}$ .



**3. Construct a quadrilateral XYZW in which  $XY = 5\text{ cm}$ ,  $YZ = 6\text{ cm}$ ,  $ZW = 7\text{ cm}$ ,  $WX = 3\text{ cm}$  and  $XZ = 9\text{ cm}$ .**

**Solution:**

The given details are  $XY = 5\text{cm}$ ,  $YZ = 6\text{cm}$ ,  $ZW = 7\text{cm}$ ,  $WX = 3\text{cm}$  and  $XZ = 9\text{cm}$ .

Steps to construct a quadrilateral:

Step 1- Draw line  $XZ$  of length  $9\text{cm}$ .

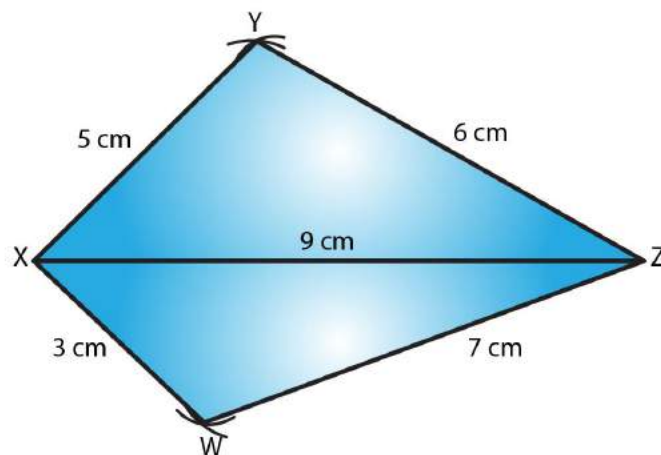
Step 2- Cut an arc by taking X as the centre radius  $XY = 5\text{cm}$ . Do the same by taking Z as centre and radius  $ZY = 6\text{cm}$ .

Step 3- Now join the intersection point from X and Z and label it as Y.

Step 4- For vertex W, cut an arc by taking X as the center and radius  $XW = 3\text{cm}$ .

Similarly, taking Z as the center and radius  $ZW = 7\text{cm}$ .

Step 5- Join the intersection point from X and Z and label it as W.



**4. Construct a parallelogram PQRS such that  $PQ = 5.2$  cm,  $PR = 6.8$  cm, and  $QS = 8.2$  cm.**

**Solution:**

The given details are  $PQ = 5.2$  cm,  $PR = 6.8$  cm, and  $QS = 8.2$  cm.

Steps to construct a parallelogram:

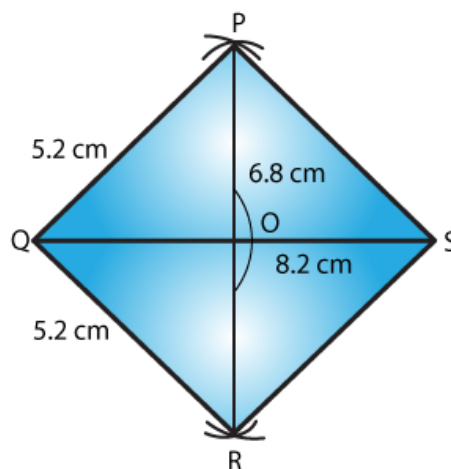
Step 1- Draw line  $QS$  of length  $8.2$  cm.

Step 2- Divide the line segment  $QS$  into half i.e  $4.1$  cm and mark that point as  $O$ . Now by taking  $O$  as center cut an arc on both the sides of  $O$  with a radius of  $3.4$ cm each. And mark that points as  $P$  and  $R$ .

Step 3- cut an arc by taking  $Q$  as a center and radius  $QR = 5.2$ cm to intersect with point  $R$ .

Step 4- cut an arc by taking  $Q$  as a center and radius  $QP = 5.2$ cm to intersect with point  $P$ .

Step 5- Join sides  $PQ$ ,  $PS$ ,  $QR$  and  $RS$ .



**5. Construct a rhombus with side  $6$  cm and one diagonal  $8$  cm. Measure the other diagonal.**

**Solution:**

The given details are side  $6$  cm and one diagonal  $8$  cm.

We know all the sides of a rhombus are equal and diagonals bisect each other.

Steps to construct a rhombus:

Step 1- Draw a line  $XZ$  of length  $8$  cm.

Step 2- By taking a radius of  $6$  cm, cut an arc by taking  $X$  as the center. Do the same by taking  $Z$  as centre with radius of  $6$  cm.

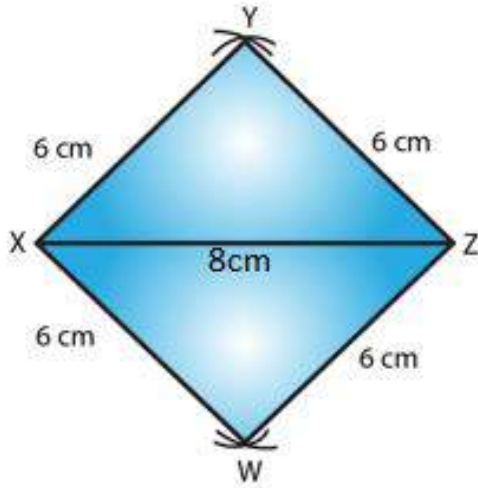
Step 3- Now join the intersection point from  $X$  and  $Z$  and label it as  $Y$ .

Step 4- Now for vertex  $W$ , by taking radius of  $6$  cm and cut an arc by taking  $X$  as the

center. Do the same by taking Z as center and radius of 6 cm.

Step 5- Join the intersection point from X and Z and label it as W.

Step 6- Now join XY, XW, XZ and ZY



**6. Construct a kite ABCD in which  $AB = 4$  cm,  $BC = 4.9$  cm,  $AC = 7.2$  cm.**

**Solution:**

The given details are  $AB = 4$  cm,  $BC = 4.9$  cm,  $AC = 7.2$  cm.

Steps to construct a kite:

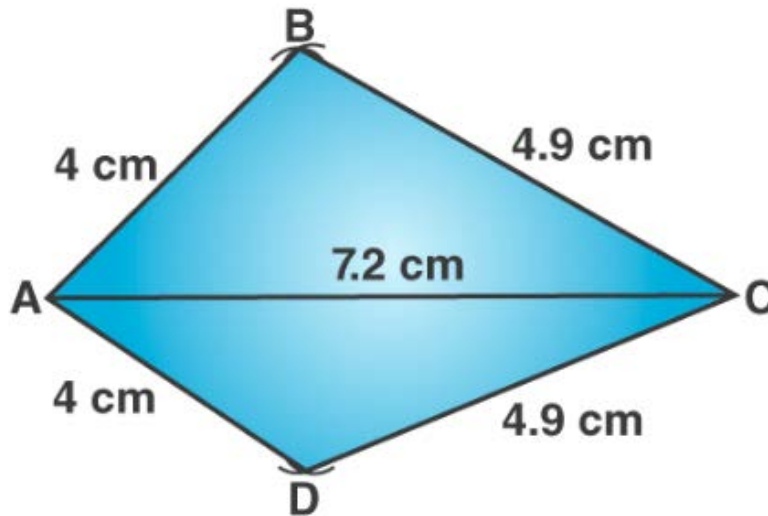
Step 1- Draw line AC of length 7.2 cm.

Step 2- By taking a radius of 4 cm and cut an arc by taking A as the center. Do the same by taking C as centre with radius of 4.9 cm.

Step 3- Now join the intersection point from A and C and label it as B.

Step 4- Now for vertex D, cut an arc by taking A as the center. Do the same by taking C as center with radius of 4.9 cm.

Step 5- Join the intersection point from A and C and label it as D.



**7. Construct, if possible, a quadrilateral ABCD given  $AB = 6$  cm,  $BC = 3.7$  cm,  $CD = 5.7$  cm,  $AD = 5.5$  cm and  $BD = 6.1$  cm. Give reasons for not being able to construct it, if you cannot.**

**Solution:**

The given details are  $AB = 6$  cm,  $BC = 3.7$  cm,  $CD = 5.7$  cm,  $AD = 5.5$  cm and  $BD = 6.1$  cm.

Steps to construct a quadrilateral:

Step 1- Draw a line AB of length 6cm.

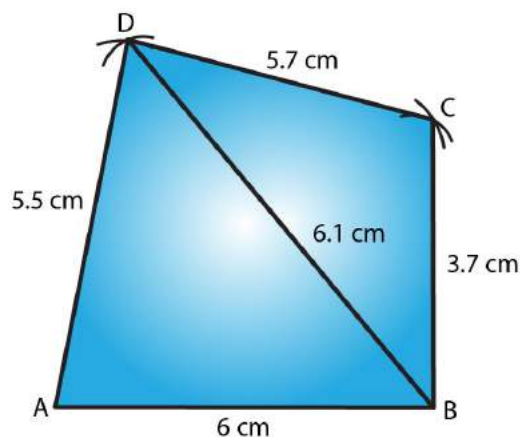
Step 2- With A as a center cut an arc of radius 5.5cm and mark that point as D.

Step 3- With B as a center cut an arc of radius 6.1cm to intersect with point D.

Step 4- With B as a center cut an arc of radius 3.7cm and mark that point as C.

Step 5- With D as a center cut an arc of radius 5.7cm to intersect with point C.

Step 6- Now join AD, BD, BC and DC



**8. Construct, if possible, a quadrilateral ABCD in which  $AB = 6$  cm,  $BC = 7$  cm,  $CD = 3$  cm,  $AD = 5.5$  cm and  $AC = 11$  cm. Give reasons for not being able to construct, if you cannot. (Not possible, because in triangle ACD,  $AD + CD < AC$ ).**

**Solution:**

The given details are  $AB = 6$  cm,  $BC = 7$  cm,  $CD = 3$  cm,  $AD = 5.5$  cm and  $AC = 11$  cm. Such a Quadrilateral cannot be constructed because, in a triangle, the sum of the length of its two sides must be greater than that of the third side.

In triangle ACD,

$$AD + CD = 5.5 + 3 = 8.5 \text{ cm}$$

Given,  $AC = 11$  cm

So,  $AD + CD < AC$  which is not possible.

$\therefore$  The construction is not possible



**EXERCISE 18.2**

**PAGE NO: 18.6**

**1. Construct a quadrilateral ABCD in which AB = 3.8 cm, BC = 3.0 cm, AD = 2.3 cm, AC = 4.5 cm and BD = 3.8 cm.**

**Solution:**

The given details are AB = 3.8 cm, BC = 3.0 cm, AD = 2.3 cm, AC = 4.5 cm and BD = 3.8 cm.

Steps to construct a quadrilateral:

Step 1- Draw a line AC = 6cm.

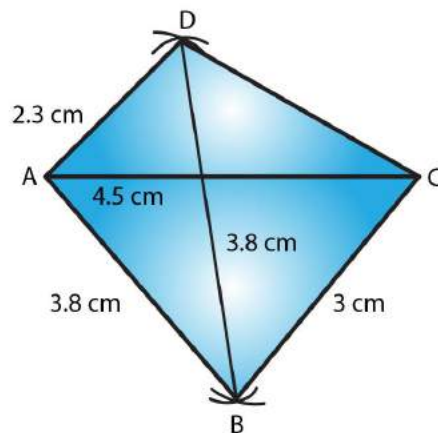
Step 2- Cut an arc of radius 3.8cm with A as the center to mark that point as B.

Step 3- Cut an arc of radius 3cm with C as the center to intersect with point B.

Step 4- Cut an arc of radius 3.8cm with B as the center to mark that point as D.

Step 5- Cut an arc of radius 2.3cm with A as the center to intersect with point D.

Step 6- Now join AB, BD, AD and DC



**2. Construct a quadrilateral ABCD in which BC = 7.5 cm, AC = AD = 6 cm, CD = 5 cm and BD = 10 cm.**

**Solution:**

The given details are BC = 7.5 cm, AC = AD = 6 cm, CD = 5 cm and BD = 10 cm.

Steps to construct a quadrilateral:

Step 1- Draw a line AC = 6cm.

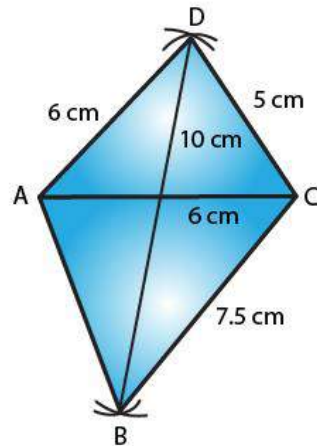
Step 2- Cut an arc of radius 6cm with A as the center to mark that point as D.

Step 3- Cut an arc of radius 5cm with C as the center to intersect at point D.

Step 4- Cut an arc of radius 10cm with D as the center to mark that point as B.

Step 5- Cut an arc of radius 7.5cm with C as the center to intersect at point B.

Step 6- Now join AD, CD, DB and AB



**3. Construct a quadrilateral ABCD when  $AB = 3$  cm,  $CD = 3$  cm,  $DA = 7.5$  cm,  $AC = 8$  cm and  $BD = 4$  cm.**

**Solution:**

The given details are  $AB = 3$  cm,  $CD = 3$  cm,  $DA = 7.5$  cm,  $AC = 8$  cm and  $BD = 4$  cm.

Consider a triangle ABD from the given data,

So,  $AB + BD = 3 + 4 = 7$  cm

We know that sum of lengths of two sides of a triangle is always greater than the third side.

$\therefore$  The construction is not possible.

**4. Construct a quadrilateral ABCD given  $AD = 3.5$  cm,  $BC = 2.5$  cm,  $CD = 4.1$  cm,  $AC = 7.3$  cm and  $BD = 3.2$  cm.**

**Solution:**

The given details are  $AD = 3.5$  cm,  $BC = 2.5$  cm,  $CD = 4.1$  cm,  $AC = 7.3$  cm and  $BD = 3.2$  cm.

Steps to construct a quadrilateral:

Step 1- Draw a line  $CD = 4.1$  cm

Step 2- Cut an arc of radius 7.3 cm with C as the center to mark that point as A.

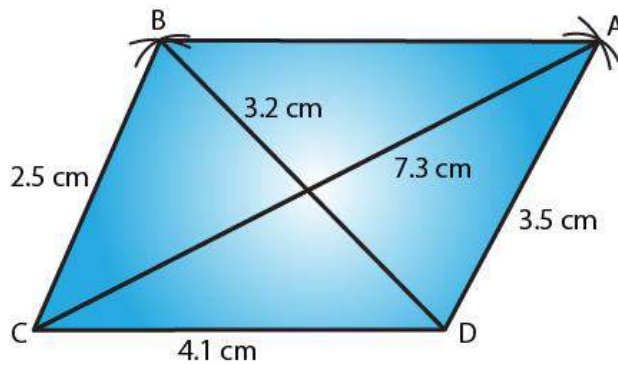
Step 3- Cut an arc of radius 3.5 cm with D as the center to intersect at point A.

Step 4- Cut an arc of radius 3.2 cm with D as the center to mark that point as B.

Step 5- Cut an arc of radius 2.5 cm with C as the center to intersect at point B.

Step 6- Now join CA, DA, DB, CB and AB





**5. Construct a quadrilateral ABCD given  $AD = 5$  cm,  $AB = 5.5$  cm,  $BC = 2.5$  cm,  $AC = 7.1$  cm and  $BD = 8$  cm.**

**Solution:**

The given details are  $AD = 5$  cm,  $AB = 5.5$  cm,  $BC = 2.5$  cm,  $AC = 7.1$  cm and  $BD = 8$  cm.

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 5.5$ cm

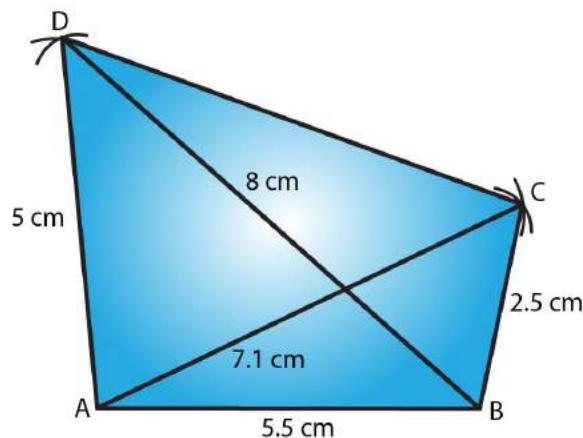
Step 2- Cut an arc of radius  $2.5$ cm with  $B$  as the center to mark that point as  $C$ .

Step 3- Cut an arc of radius  $7.1$ cm with  $A$  as the center to intersect at point  $C$ .

Step 4- Cut an arc of radius  $8$ cm with  $B$  as the center to mark that point as  $D$ .

Step 5- Cut an arc of radius  $5$ cm with  $A$  as the center to intersect at point  $D$ .

Step 6- Now join  $BC$ ,  $AC$ ,  $BD$ ,  $AD$  and  $CD$



**6. Construct a quadrilateral ABCD in which  $BC = 4$  cm,  $CA = 5.6$  cm,  $AD = 4.5$  cm,  $CD = 5$  cm and  $BD = 6.5$  cm.**

**Solution:**

The given details are  $BC = 4\text{ cm}$ ,  $CA = 5.6\text{ cm}$ ,  $AD = 4.5\text{ cm}$ ,  $CD = 5\text{ cm}$  and  $BD = 6.5\text{ cm}$  cm.

Steps to construct a quadrilateral:

Step 1- Draw a line  $BC = 4\text{ cm}$

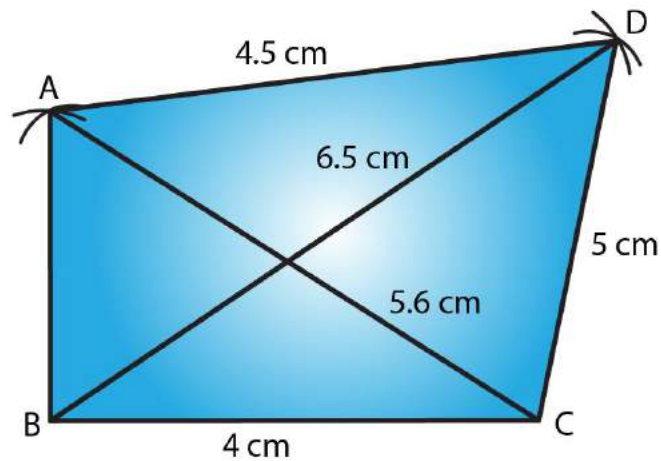
Step 2- Cut an arc of radius  $6.5\text{ cm}$  with  $B$  as the center to mark that point as  $D$ .

Step 3- Cut an arc of radius  $5\text{ cm}$  with  $C$  as the center to intersect at point  $D$ .

Step 4- Cut an arc of radius  $5.6\text{ cm}$  with  $C$  as the center to mark that point as  $A$ .

Step 5- Cut an arc of radius  $4.5\text{ cm}$  with  $D$  as the center to intersect at point  $A$ .

Step 6- Now join  $BD$ ,  $CD$ ,  $CA$ ,  $DA$  and  $AB$



**EXERCISE 18.3**

**PAGE NO: 18.8**

**1. 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 given details are AB = 3.8 cm, BC = 3.4 cm, CD = 4.5 cm, AD = 5 cm and  $\angle B = 80^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line AB = 3.8cm

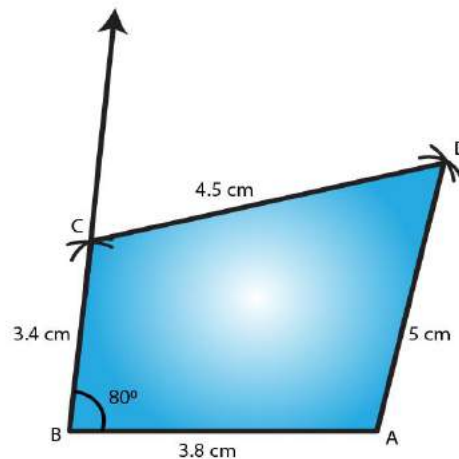
Step 2- Construct an angle of  $80^\circ$  at B.

Step 3- Cut an arc of radius 3.4cm with B as the center to mark that point as C.

Step 4- Cut an arc of radius 5cm with A as the center to mark that point as D.

Step 5- Cut an arc of radius 4.5cm with C as the center to intersect at point D.

Step 6- Now join BC, AD and CD



**2. Construct a quadrilateral ABCD given that AB = 8 cm, BC = 8 cm, CD = 10 cm, AD = 10 cm and  $\angle A = 45^\circ$ .**

**Solution:**

The given details are AB = 8 cm, BC = 8 cm, CD = 10 cm, AD = 10 cm and  $\angle A = 45^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line AB = 8cm

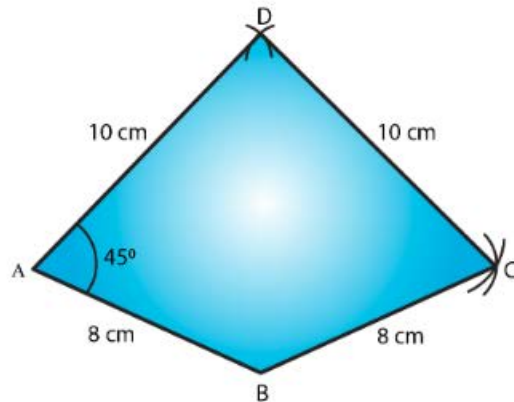
Step 2- Construct an angle of  $45^\circ$  at A.

Step 3- Cut an arc of radius 10cm with A as the center to mark that point as D.

Step 4- Cut an arc of radius 10cm with D as the center to mark that point as C.

Step 5- Cut an arc of radius 8cm with B as the center to intersect at point C.

Step 6- Now join AD, DC and BC



**3. Construct a quadrilateral ABCD in which  $AB = 7.7$  cm,  $BC = 6.8$  cm,  $CD = 5.1$  cm,  $AS = 3.6$  cm and  $\angle C = 120^\circ$ .**

**Solution:**

The given details are  $AB = 7.7$  cm,  $BC = 6.8$  cm,  $CD = 5.1$  cm,  $AS = 3.6$  cm and  $\angle C = 120^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $DC = 5.1$  cm

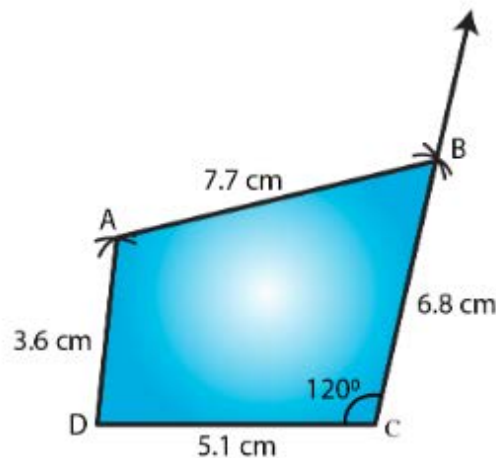
Step 2- Construct an angle of  $120^\circ$  at C.

Step 3- Cut an arc of radius 6.8 cm with C as the center to mark that point as B.

Step 4- Cut an arc of radius 7.7 cm with B as the center to mark that point as A.

Step 5- Cut an arc of radius 3.6 cm with D as the center to intersect at point A.

Step 6- Now join CB, BA and DA



**4. Construct a quadrilateral ABCD in which  $AB = BC = 3$  cm,  $AD = CD = 5$  cm and  $\angle B = 120^\circ$ .**

**Solution:**

The given details are  $AB = BC = 3$  cm,  $AD = CD = 5$  cm and  $\angle B = 120^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 3$ cm

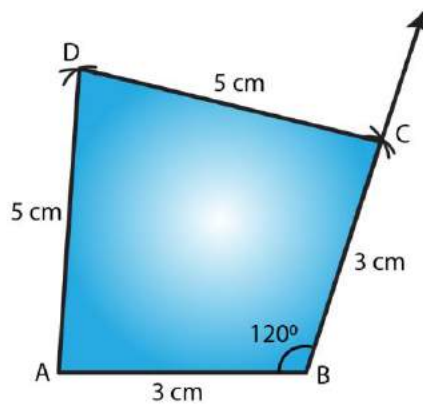
Step 2- Construct an angle of  $120^\circ$  at B.

Step 3- Cut an arc of radius 3cm with B as the center to mark that point as C.

Step 4- Cut an arc of radius 5cm with C as the center to mark that point as D.

Step 5- Cut an arc of radius 5cm with A as the center to intersect at point D.

Step 6- Now join BC, CD and DA



**5. Construct a quadrilateral ABCD in which  $AB = 2.8$  cm,  $BC = 3.1$  cm,  $CD = 2.6$  cm and  $DA = 3.3$  cm and  $\angle A = 60^\circ$ .**

**Solution:**

The given details are  $AB = 2.8$  cm,  $BC = 3.1$  cm,  $CD = 2.6$  cm and  $DA = 3.3$  cm and  $\angle A = 60^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 2.8$ cm

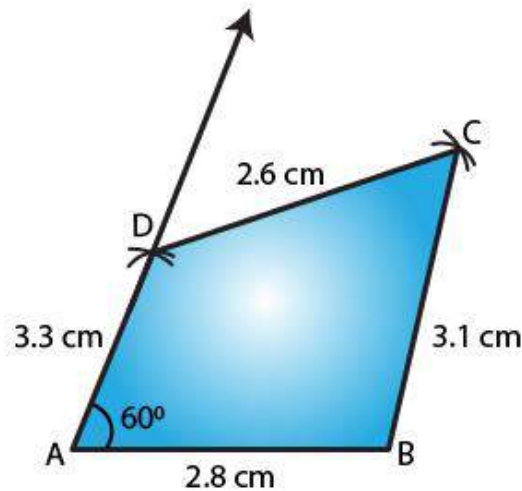
Step 2- Construct an angle of  $60^\circ$  at A.

Step 3- Cut an arc of radius 3.3cm with A as the center to mark that point as D.

Step 4- Cut an arc of radius 2.6cm with D as the center to mark that point as C.

Step 5- Cut an arc of radius 3.1cm with B as the center to intersect at point C.

Step 6- Now join AD, DC and CB



**6. Construct a quadrilateral ABCD in which  $AB = BC = 6$  cm,  $AD = DC = 4.5$  cm and  $\angle B = 120^\circ$ .**

**Solution:**

The given details are  $AB = BC = 6$  cm,  $AD = DC = 4.5$  cm and  $\angle B = 120^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 6$  cm

Step 2- Construct an angle of  $120^\circ$  at B.

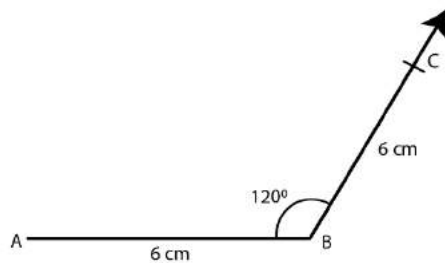
Step 3- Cut an arc of radius 6 cm with B as the center to mark that point as C.

Here, AC is about 10.3 cm in length which is greater than  $AD + DC = 4.5 + 4.5 = 9$  cm

We know that sum of the two sides of a triangle is always greater than the third side.

$AD + DC < AC$

$\therefore$  Construction is not possible.





**EXERCISE 18.4**

**PAGE NO: 18.10**

**1. Construct a quadrilateral ABCD in which  $AB = 6\text{ cm}$ ,  $BC = 4\text{ cm}$ ,  $CD = 4\text{ cm}$ ,  $\angle B = 95^\circ$  and  $\angle C = 90^\circ$ .**

**Solution:**

The given details are  $AB = 6\text{ cm}$ ,  $BC = 4\text{ cm}$ ,  $CD = 4\text{ cm}$ ,  $\angle B = 95^\circ$  and  $\angle C = 90^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $BC = 4\text{ cm}$

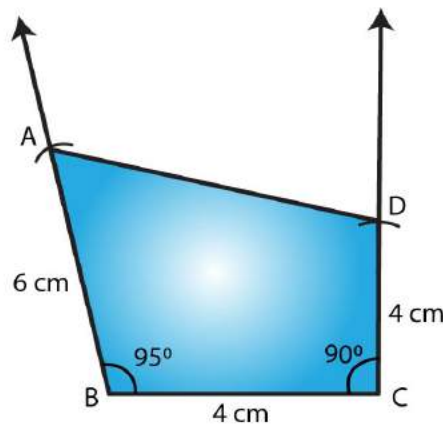
Step 2- Construct an angle of  $95^\circ$  at B.

Step 3- Cut an arc of radius  $6\text{ cm}$  with B as the center to mark that point as A.

Step 4- Construct an angle of  $90^\circ$  at C.

Step 5- Cut an arc of radius  $4\text{ cm}$  with C as the center to mark that point as D.

Step 6- Now join BA, CD and AD



**2. Construct a quadrilateral ABCD where  $AB = 4.2\text{ cm}$ ,  $BC = 3.6\text{ cm}$ ,  $CD = 4.8\text{ cm}$ ,  $\angle B = 30^\circ$  and  $\angle C = 150^\circ$ .**

**Solution:**

The given details are  $AB = 4.2\text{ cm}$ ,  $BC = 3.6\text{ cm}$ ,  $CD = 4.8\text{ cm}$ ,  $\angle B = 30^\circ$  and  $\angle C = 150^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $BC = 3.6\text{ cm}$

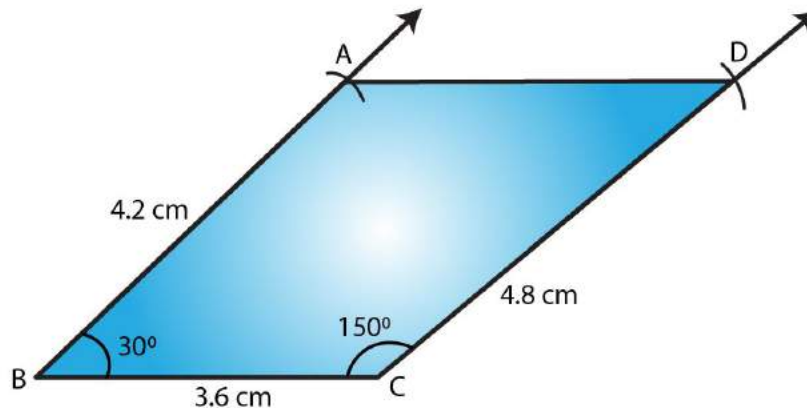
Step 2- Construct an angle of  $30^\circ$  at B.

Step 3- Cut an arc of radius  $4.2\text{ cm}$  with B as the center to mark that point as A.

Step 4- Construct an angle of  $150^\circ$  at C.

Step 5- Cut an arc of radius  $4.8\text{ cm}$  with C as the center to mark that point as D.

Step 6- Now join BA, CD and AD



**3. Construct a quadrilateral PQRS in which PQ = 3.5 cm, QR = 2.5 cm, RS = 4.1 cm,  $\angle Q = 75^\circ$  and  $\angle R = 120^\circ$ .**

**Solution:**

The given details are PQ = 3.5 cm, QR = 2.5 cm, RS = 4.1 cm,  $\angle Q = 75^\circ$  and  $\angle R = 120^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line QR = 2.5cm

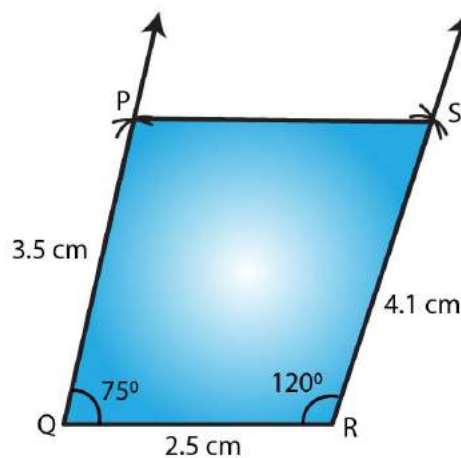
Step 2- Construct an angle of  $75^\circ$  at Q.

Step 3- Cut an arc of radius 3.5cm with Q as the center to mark that point as P.

Step 4- Construct an angle of  $120^\circ$  at R.

Step 5- Cut an arc of radius 4.1cm with R as the center to mark that point as S.

Step 6- Now join QP, RS and PS



**4. Construct a quadrilateral ABCD given  $BC = 6.6$  cm,  $CD = 4.4$  cm,  $AD = 5.6$  cm  $\angle D = 100^\circ$  and  $\angle C = 95^\circ$**

**Solution:**

The given details are  $BC = 6.6$  cm,  $CD = 4.4$  cm,  $AD = 5.6$  cm  $\angle D = 100^\circ$  and  $\angle C = 95^\circ$

Steps to construct a quadrilateral:

Step 1- Draw a line  $DC = 4.4$ cm

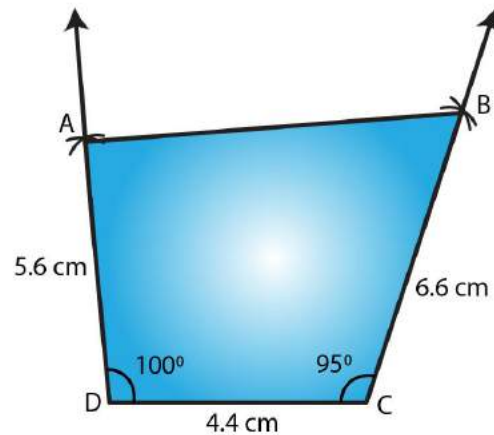
Step 2- Construct an angle of  $100^\circ$  at D.

Step 3- Cut an arc of radius  $5.6$ cm with D as the center to mark that point as A.

Step 4- Construct an angle of  $95^\circ$  at C.

Step 5- Cut an arc of radius  $6.6$ cm with C as the center to mark that point as B.

Step 6- Now join DA, CB and AB



**5. Construct a quadrilateral ABCD in which  $AD = 3.5$  cm,  $AB = 4.4$  cm,  $BC = 4.7$  cm,  $\angle A = 125^\circ$  and  $\angle B = 120^\circ$ .**

**Solution:**

The given details are  $AD = 3.5$  cm,  $AB = 4.4$  cm,  $BC = 4.7$  cm,  $\angle A = 125^\circ$  and  $\angle B = 120^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 4.4$ cm

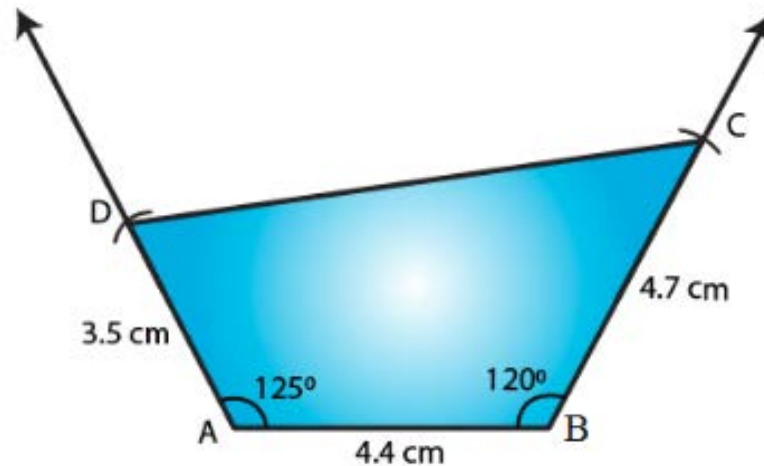
Step 2- Construct an angle of  $125^\circ$  at A.

Step 3- Cut an arc of radius  $3.5$ cm with A as the center to mark that point as D.

Step 4- Construct an angle of  $120^\circ$  at B.

Step 5- Cut an arc of radius  $4.7$ cm with B as the center to mark that point as C.

Step 6- Now join AD, BC and CD



6. Construct a quadrilateral PQRS in which  $\angle Q = 45^\circ$  and  $\angle R = 90^\circ$ ,  $QR = 5$  cm,  $PQ = 9$  cm and  $RS = 7$  cm.

**Solution:**

The given details are  $\angle Q = 45^\circ$  and  $\angle R = 90^\circ$ ,  $QR = 5$  cm,  $PQ = 9$  cm and  $RS = 7$  cm.

Steps to construct a quadrilateral:

Step 1- Draw a line  $QR = 5$  cm

Step 2- Construct an angle of  $45^\circ$  at Q.

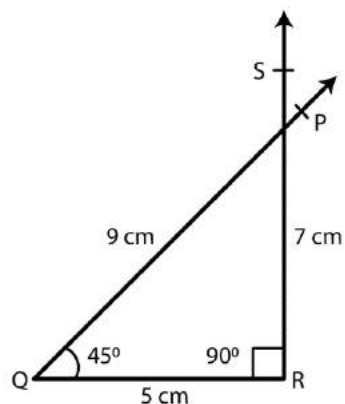
Step 3- Cut an arc of radius 9 cm with Q as the center to mark that point as P.

Step 4- Construct an angle of  $90^\circ$  at R.

Step 5- Cut an arc of radius 7 cm with R as the center to mark that point as S.

Step 6- Now join QP, RS

Since the line segment QP and RS are not intersecting at each other, quadrilateral cannot be formed.



**7. Construct a quadrilateral ABCD in which  $AB = BC = 3$  cm,  $AD = 5$  cm,  $\angle A = 90^\circ$  and  $\angle B = 105^\circ$ .**

**Solution:**

The given details are  $AB = BC = 3$  cm,  $AD = 5$  cm,  $\angle A = 90^\circ$  and  $\angle B = 105^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 3$ cm

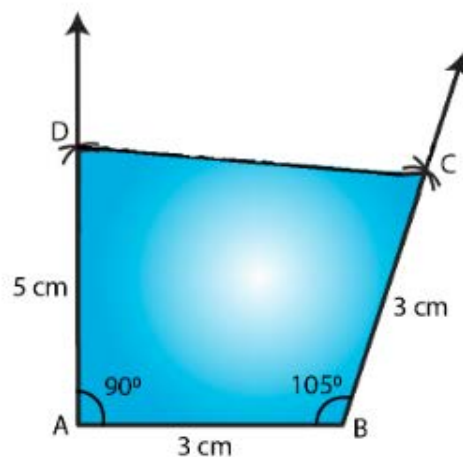
Step 2- Construct an angle of  $90^\circ$  at A.

Step 3- Cut an arc of radius 5cm with A as the center to mark that point as D.

Step 4- Construct an angle of  $105^\circ$  at B.

Step 5- Cut an arc of radius 3cm with B as the center to mark that point as C.

Step 6- Now join AD, BC and CD



**8. Construct a quadrilateral BDEF, where  $DE = 4.5$  cm,  $EF = 3.5$  cm,  $FB = 6.5$  cm,  $\angle F = 50^\circ$  and  $\angle E = 100^\circ$ .**

**Solution:**

The given details are  $DE = 4.5$  cm,  $EF = 3.5$  cm,  $FB = 6.5$  cm,  $\angle F = 50^\circ$  and  $\angle E = 100^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $EF = 3.5$ cm

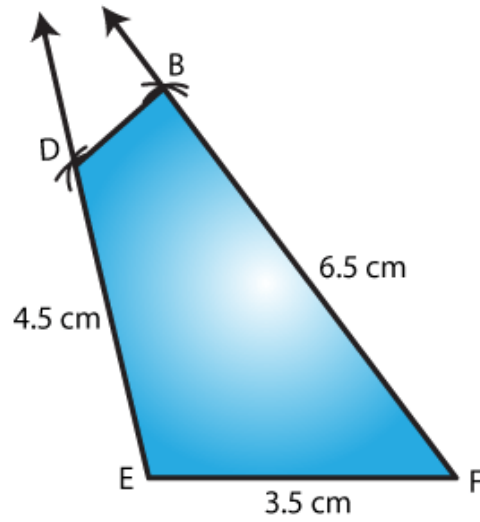
Step 2- Construct an angle of  $100^\circ$  at E.

Step 3- Cut an arc of radius 4.5cm with E as the center to mark that point as D.

Step 4- Construct an angle of  $50^\circ$  at F.

Step 5- Cut an arc of radius 6.5cm with F as the center to mark that point as B.

Step 6- Now join DE, FB and DB





**EXERCISE 18.5**

**PAGE NO: 18.13**

**1. Construct a quadrilateral ABCD given that  $AB = 4\text{ cm}$ ,  $BC = 3\text{ cm}$ ,  $\angle A = 75^\circ$ ,  $\angle B = 80^\circ$  and  $\angle C = 120^\circ$ .**

**Solution:**

The given details are  $AB = 4\text{ cm}$ ,  $BC = 3\text{ cm}$ ,  $\angle A = 75^\circ$ ,  $\angle B = 80^\circ$  and  $\angle C = 120^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 4\text{ cm}$

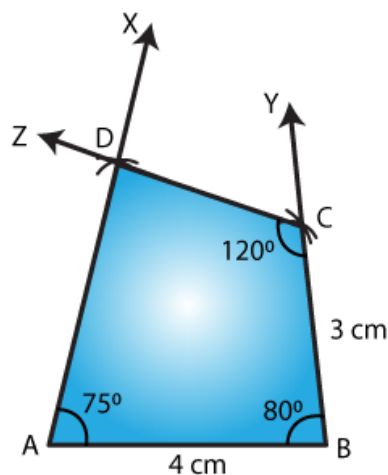
Step 2- Construct an angle of  $75^\circ$  at A.

Step 3- Construct an angle of  $80^\circ$  at B.

Step 4- Cut an arc of radius  $3\text{ cm}$  with B as the center to mark that point as C.

Step 5- Construct an angle of  $120^\circ$  at C such that it meets the line segment AX, mark that point as D.

Step 6- Now join BC, CD and DA



**2. Construct a quadrilateral ABCD where  $AB = 5.5\text{ cm}$ ,  $BC = 3.7\text{ cm}$ ,  $\angle A = 60^\circ$ ,  $\angle B = 105^\circ$  and  $\angle D = 90^\circ$ .**

**Solution:**

The given details are  $AB = 5.5\text{ cm}$ ,  $BC = 3.7\text{ cm}$ ,  $\angle A = 60^\circ$ ,  $\angle B = 105^\circ$  and  $\angle D = 90^\circ$ .

We know that  $\angle A + \angle B + \angle C + \angle D = 360^\circ$

$\therefore \angle C = 105^\circ$

Steps to construct a quadrilateral:

Step 1- Draw a line  $AB = 5.5\text{ cm}$

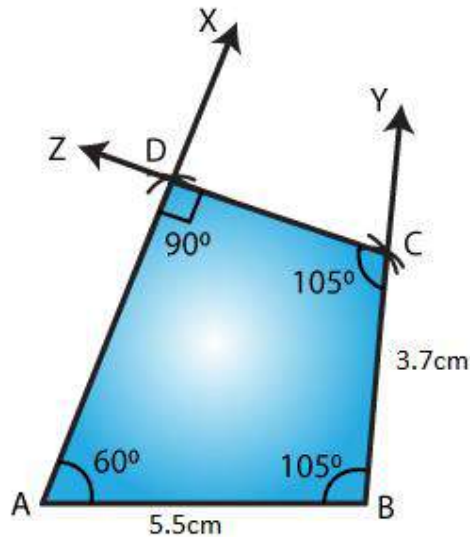
Step 2- Construct an angle of  $60^\circ$  at A.

Step 3- Construct an angle of  $105^\circ$  at B.

Step 4- Cut an arc of radius 3.7cm with B as the center to mark that point as C.

Step 5- Construct an angle of  $105^\circ$  at C such that it meets the line segment AX, mark that point as D.

Step 6- Now join BC, CD and DA



**3. Construct a quadrilateral PQRS where  $PQ = 3.5$  cm,  $QR = 6.5$  cm,  $\angle P = \angle R = 105^\circ$  and  $\angle S = 75^\circ$ .**

**Solution:**

The given details are  $PQ = 3.5$  cm,  $QR = 6.5$  cm,  $\angle P = \angle R = 105^\circ$  and  $\angle S = 75^\circ$ .

We know that  $\angle P + \angle Q + \angle R + \angle S = 360^\circ$

$$\therefore \angle Q = 75^\circ$$

Steps to construct a quadrilateral:

Step 1- Draw a line  $PQ = 3.5$ cm

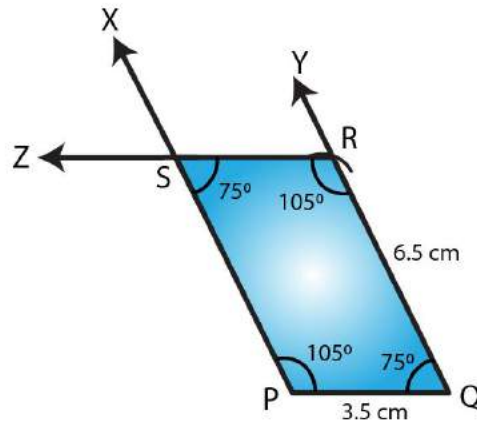
Step 2- Construct an angle of  $105^\circ$  at P.

Step 3- Construct an angle of  $75^\circ$  at Q.

Step 4- Cut an arc of radius 6.5cm with Q as the center to mark that point as R.

Step 5- Construct an angle of  $105^\circ$  at R such that it meets the line segment PX, mark that point as S.

Step 6- Now join QR, RS and PS



**4. Construct a quadrilateral ABCD when  $BC = 5.5$  cm,  $CD = 4.1$  cm,  $\angle A = 70^\circ$ ,  $\angle B = 110^\circ$  and  $\angle D = 85^\circ$ .**

**Solution:**

The given details are  $BC = 5.5$  cm,  $CD = 4.1$  cm,  $\angle A = 70^\circ$ ,  $\angle B = 110^\circ$  and  $\angle D = 85^\circ$ .

We know that  $\angle A + \angle B + \angle C + \angle D = 360^\circ$

$$\therefore \angle C = 95^\circ$$

Steps to construct a quadrilateral:

Step 1- Draw a line  $BC = 5.5$ cm

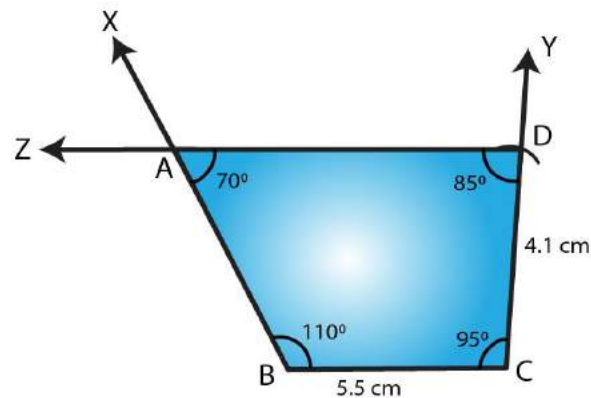
Step 2- Construct an angle of  $110^\circ$  at B.

Step 3- Construct an angle of  $95^\circ$  at C.

Step 4- Cut an arc of radius 4.1cm with C as the center to mark that point as D.

Step 5- Construct an angle of  $85^\circ$  at D such that it meets the line segment BX, mark that point as A.

Step 6- Now join CD, DA and BA



**5. Construct a quadrilateral ABCD  $\angle A = 65^\circ$ ,  $\angle B = 105^\circ$ ,  $\angle C = 75^\circ$ ,  $BC = 5.7$  cm and  $CD = 6.8$  cm.**

**Solution:**

The given details are  $\angle A = 65^\circ$ ,  $\angle B = 105^\circ$ ,  $\angle C = 75^\circ$ ,  $BC = 5.7$  cm and  $CD = 6.8$  cm.

We know that  $\angle A + \angle B + \angle C + \angle D = 360^\circ$

$$\therefore \angle D = 115^\circ$$

Steps to construct a quadrilateral:

Step 1- Draw a line  $BC = 5.7$ cm

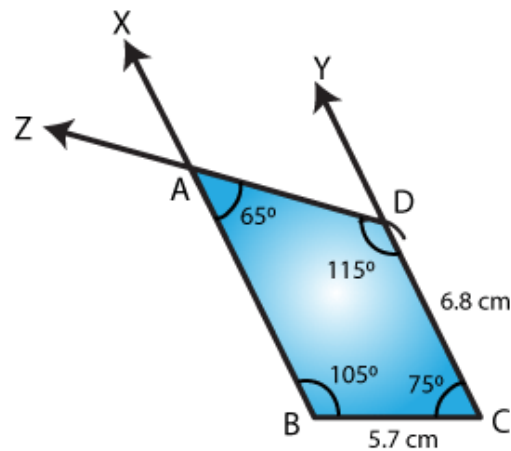
Step 2- Construct an angle of  $105^\circ$  at B.

Step 3- Construct an angle of  $75^\circ$  at C.

Step 4- Cut an arc of radius 6.8cm with C as the center to mark that point as D.

Step 5- Construct an angle of  $115^\circ$  at D such that it meets the line segment BX, mark that point as A.

Step 6- Now join CD, DA and BA



**6. Construct a quadrilateral PQRS in which  $PQ = 4$  cm,  $QR = 5$  cm  $\angle P = 50^\circ$ ,  $\angle Q = 110^\circ$  and  $\angle R = 70^\circ$ .**

**Solution:**

The given details are  $PQ = 4$  cm,  $QR = 5$  cm  $\angle P = 50^\circ$ ,  $\angle Q = 110^\circ$  and  $\angle R = 70^\circ$ .

Steps to construct a quadrilateral:

Step 1- Draw a line  $PQ = 4$ cm

Step 2- Construct an angle of  $50^\circ$  at P.

Step 3- Construct an angle of  $110^\circ$  at Q.

Step 4- Cut an arc of radius 5cm with Q as the center to mark that point as R.

Step 5- Construct an angle of  $70^\circ$  at R such that it meets the line segment PX, mark that point as S.

Step 6- Now join QR, RS and PS

