

**EXERCISE 18.1**

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**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.

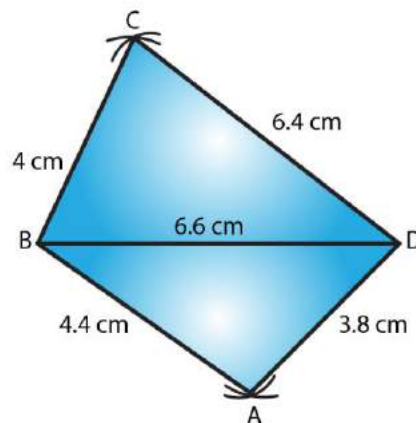
Step 2- Cut an arc with B as the centre and radius BC = 4cm. Do the same by taking D as centre and radius CD = 6.4 cm.

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:

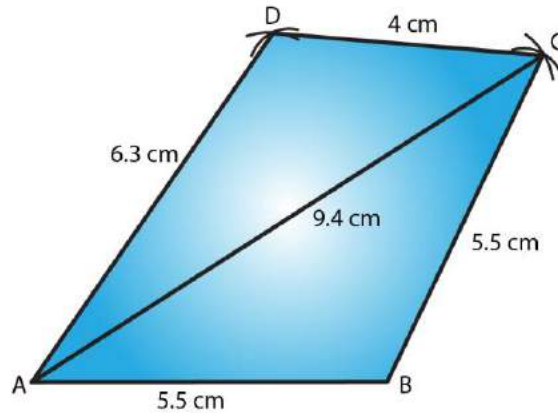
Step 1- Draw a line segment AB = 5.5cm

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 5.1cm.



**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 9cm.

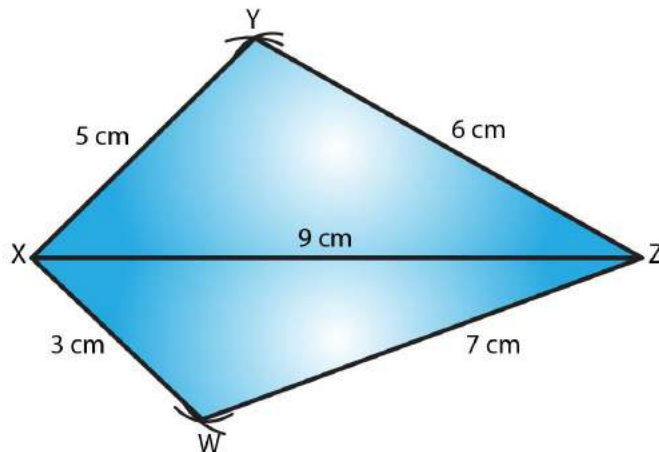
Step 2- Cut an arc by taking X as the centre radius  $XY = 5\text{cm}$ . Do the same by taking Z as centre and radius  $ZY = 6\text{cm}$ .

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:

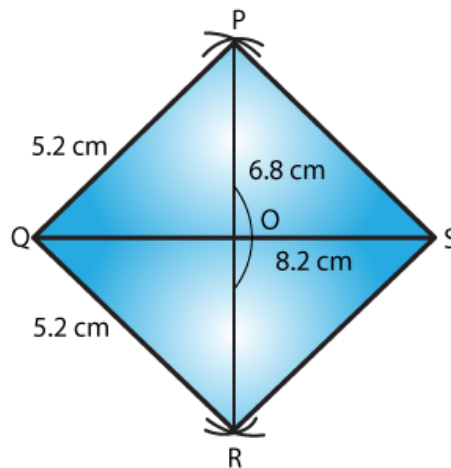
Step 1- Draw line  $QS$  of length  $8.2$  cm.

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.

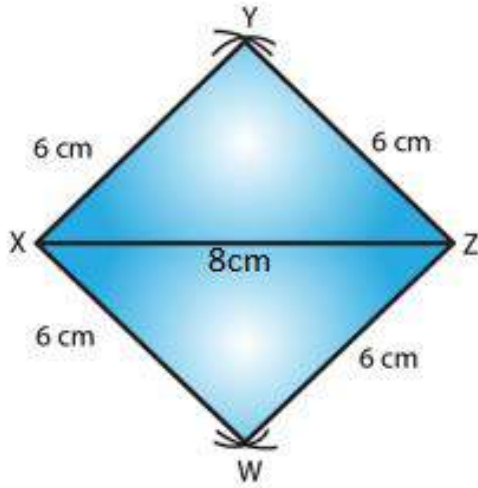
Step 3- Now join the intersection point from  $X$  and  $Z$  and label it as  $Y$ .

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:

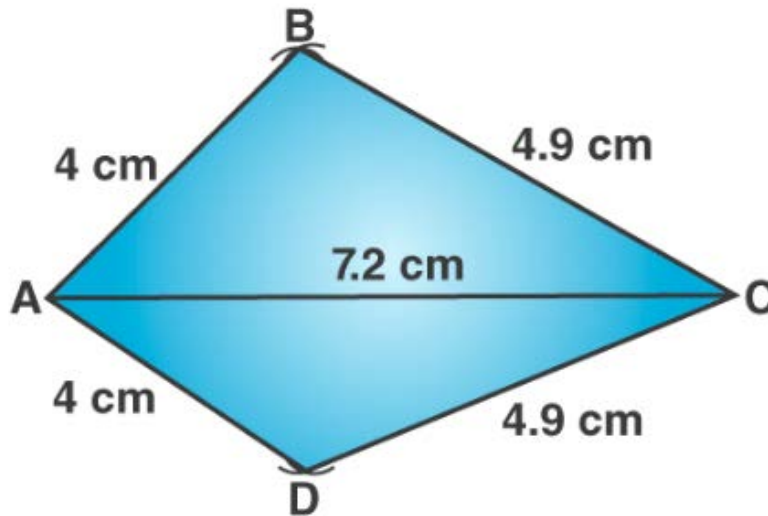
Step 1- Draw line AC of length 7.2 cm.

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.

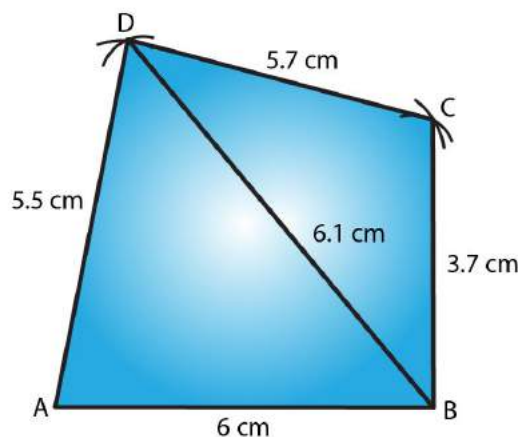
Step 2- With  $A$  as a center cut an arc of radius 5.5cm and mark that point as  $D$ .

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