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., ΔABD and ΔBCD
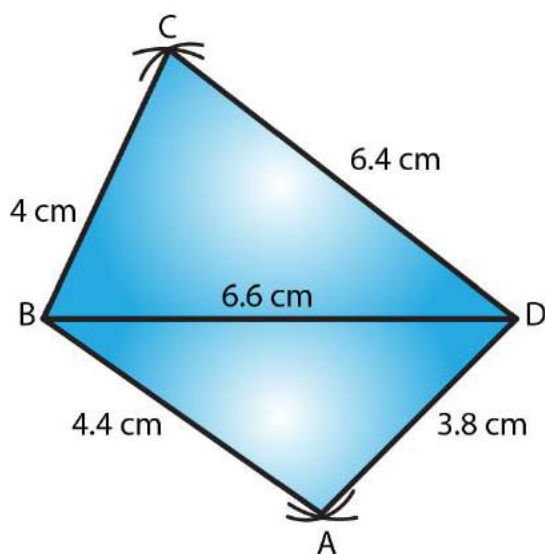
Steps to construct a quadrilateral:

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 centre and radius BA = 4.4cm. Do the same by taking D as centre 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

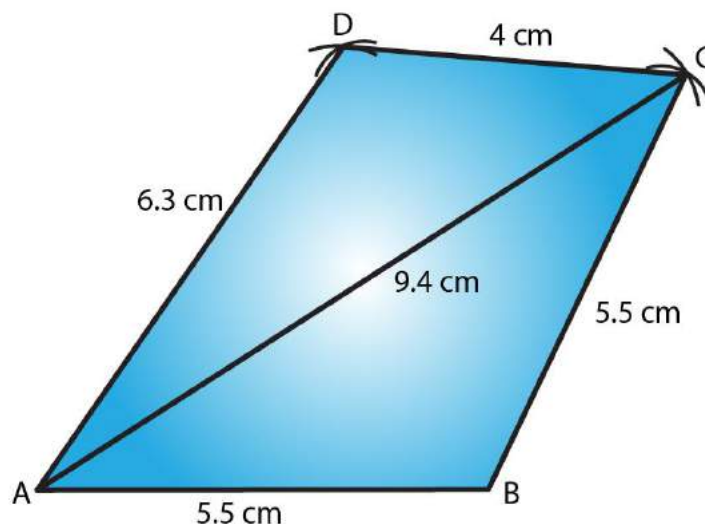Step 2- With B as centre and radius BC = 5.5cm cut an arc. Mark that point as C.

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

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

Step 5- With A as centre and radius AD = 6.3cm 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 cm, YZ = 6 cm, ZW = 7 cm, WX = 3 cm and XZ = 9 cm.

Solution:

The given details are XY = 5cm, YZ = 6cm, ZW = 7cm, WX = 3cm and XZ = 9cm.

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 = 5cm. Do the same by taking Z as centre and radius ZY = 6cm.

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 centre and radius XW = 3cm. Similarly, taking Z as the centre and radius ZW = 7cm.

Step 5- Join the intersection point from X and Z and label it as W.
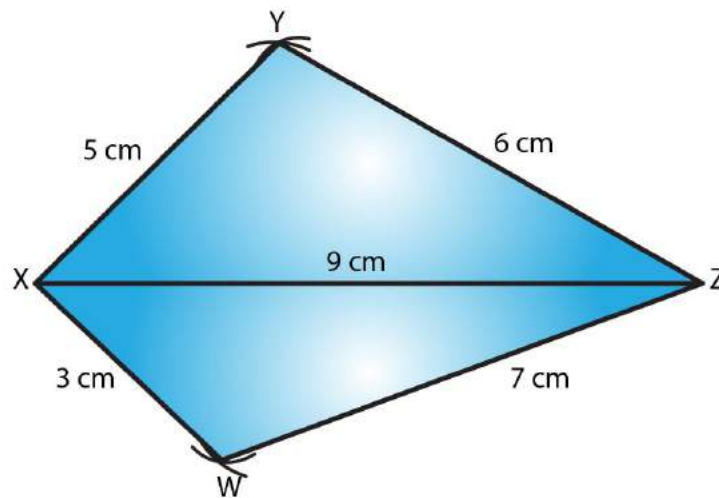
4. Construct a parallelogram PQRS such that PQ = 5.2 cm, PR = 6.8 cm, and QS = 8.2 cm.

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 centre cut an arc on both the sides of O with a radius of 3.4cm each. And mark that points as P and R.

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

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

Step 5- Join sides PQ, PS, QR and RS.
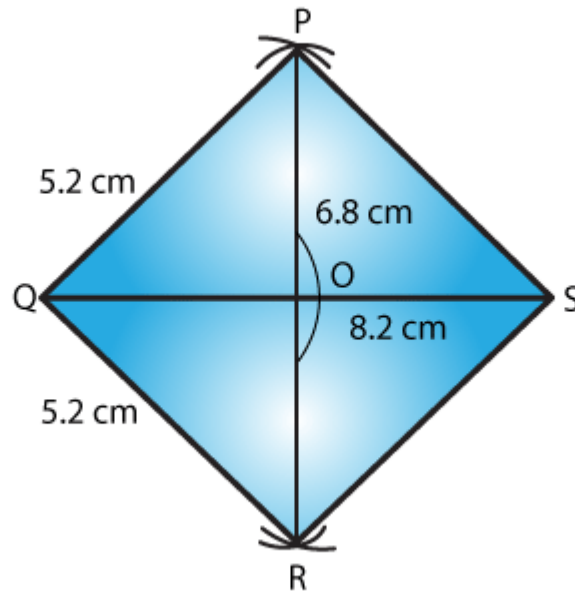
5. Construct a rhombus with side 6 cm and one diagonal 8 cm. Measure the other diagonal.

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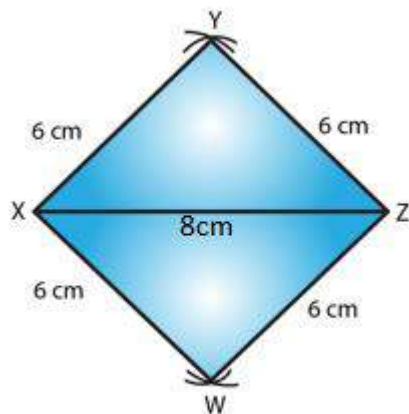
Step 1- Draw a line XZ of length 8 cm.

Step 2- By taking a radius of 6 cm, cut an arc by taking X as the centre. 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 centre. Do the same by taking Z as centre 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.
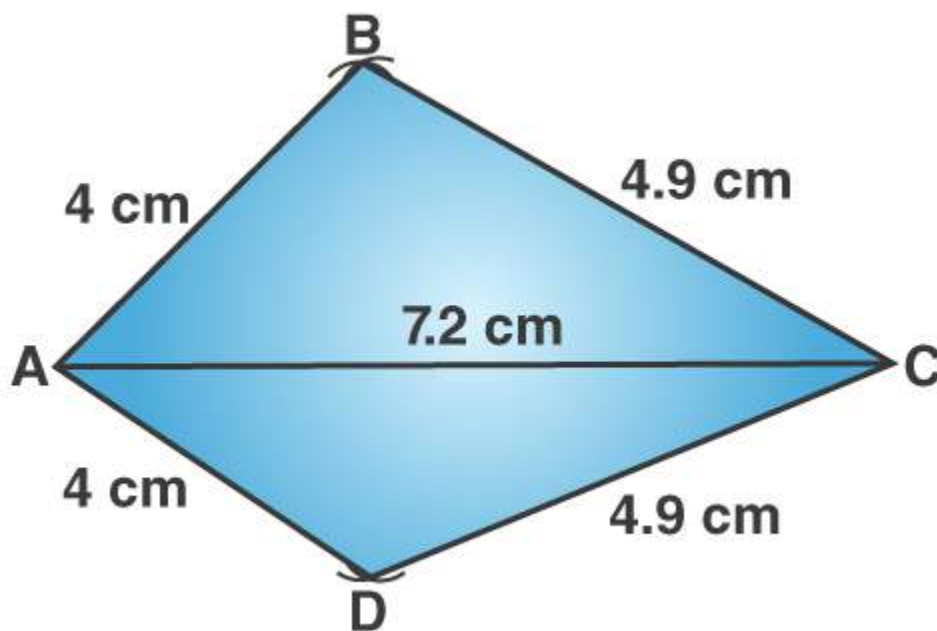
Steps to construct a kite:

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 centre. 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 centre. Do the same by taking C as centre 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.

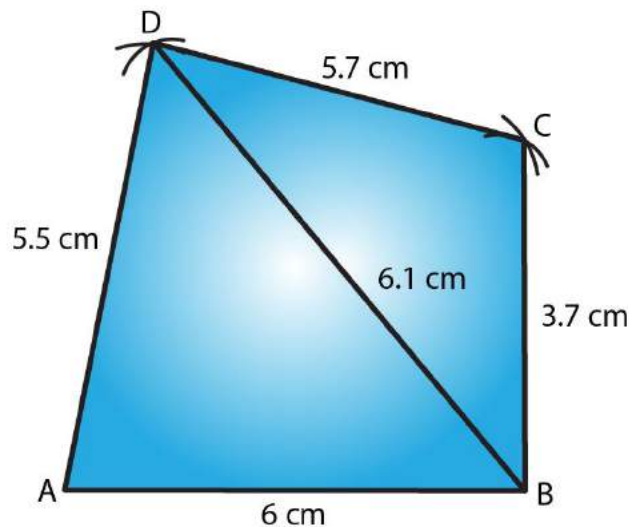Steps to construct a quadrilateral:

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

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

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

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

Step 5- With D as a centre 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 cm

Given, AC = 11 cm

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

∴ The construction is not possible