RD Sharma Solutions for Class 8 Maths Chapter 18 – Practical Geometry (Constructions)

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:

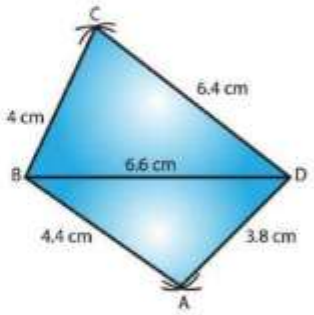
Step 1- By using SSS congruency rule, Draw line BD of length 6.6 cm.

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 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:

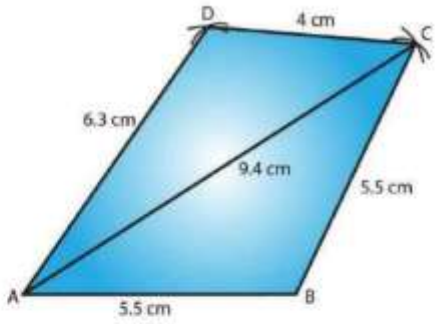
Step 1- Draw a line segment AB = 5.5cm

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.

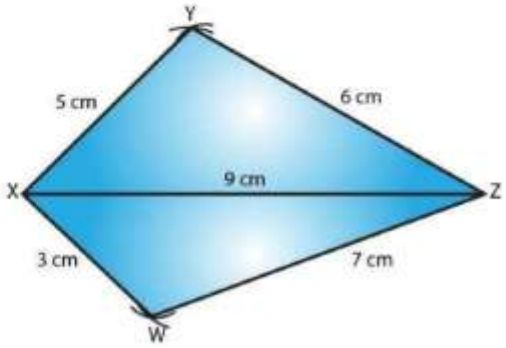
Step 5- With A as center and radius AD = 6.3cm cut an arc to intersect at point D.
Step 6- Now join BC, CD and AD
Measure of BD is 5.1cm.



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 center and radius XW = 3cm. Similarly, taking Z as the center 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:

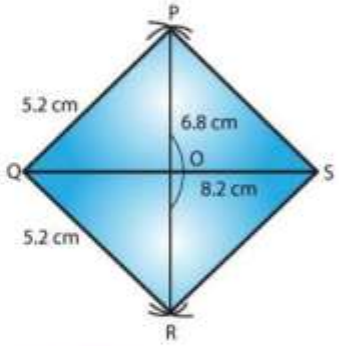
Step 1- Draw line QS of length 8.2 cm.

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 center 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 center and radius QR = 5.2cm to intersect with point R.

Step 4- cut an arc by taking Q as a center 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:

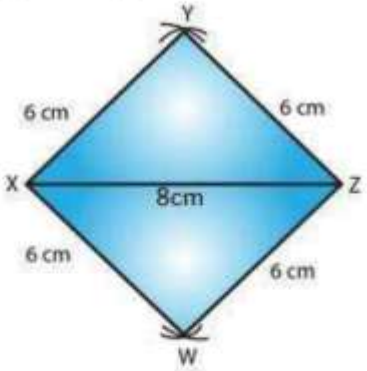
Step 1- Draw a line XZ of length 8 cm.

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

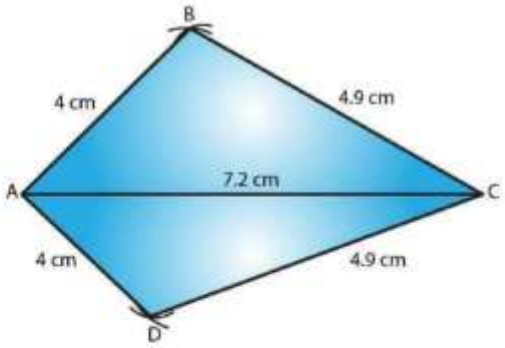
Step 3- Now join the intersection point from X and Z and label it as Y.

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.

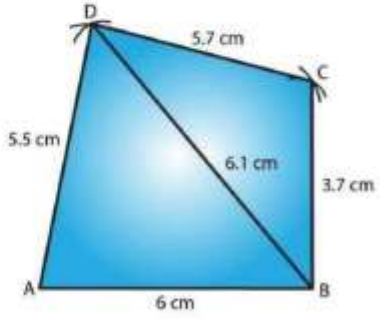
Step 2- With A as a center cut an arc of radius 5.5cm and mark that point as D.

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 cm
Given, AC = 11 cm
So, AD + CD < AC which is not possible.
∴ 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.

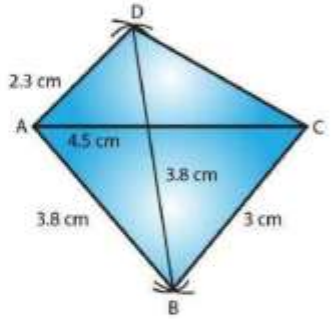
Step 2- Cut an arc of radius 3.8cm with A as the center to mark that point as B.

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.

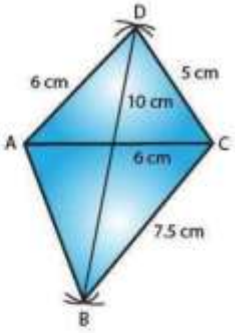
Step 2- Cut an arc of radius 6cm with A as the center to mark that point as D.

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 = 7cm

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

∴ 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 = 4.1cm

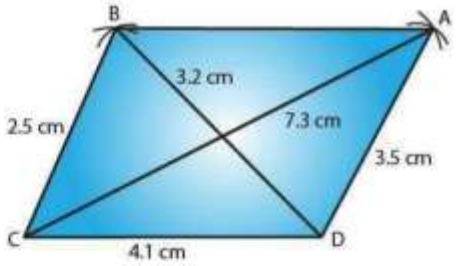
Step 2- Cut an arc of radius 7.3cm with C as the center to mark that point as A.

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

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

Step 5- Cut an arc of radius 2.5cm 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 = 5.5cm

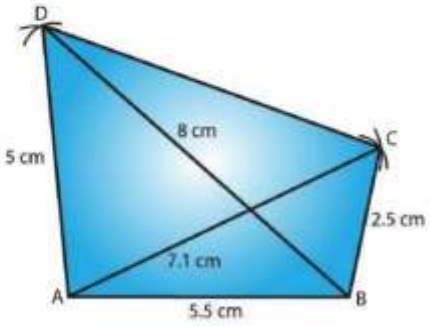
Step 2- Cut an arc of radius 2.5cm with B as the center to mark that point as C.

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

Step 4- Cut an arc of radius 8cm with B 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, 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 cm, CA = 5.6 cm, AD = 4.5 cm, CD = 5 cm and BD = 6.5 cm.

Steps to construct a quadrilateral:

Step 1- Draw a line BC = 4cm

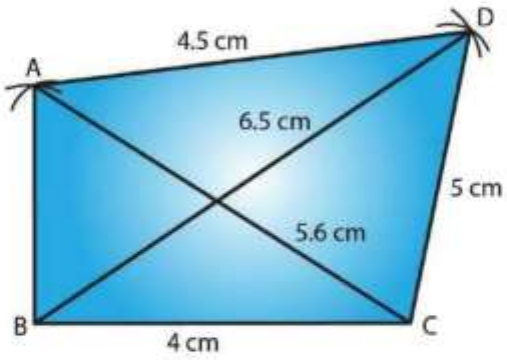
Step 2- Cut an arc of radius 6.5cm with B as the center to mark that point as D.

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 5.6cm with C as the center to mark that point as A.

Step 5- Cut an arc of radius 4.5cm 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 ∠B = 80°.

Solution:

The given details are AB = 3.8 cm, BC = 3.4 cm, CD = 4.5 cm, AD = 5 cm and ∠B = 80°.

Steps to construct a quadrilateral:

Step 1- Draw a line AB = 3.8cm

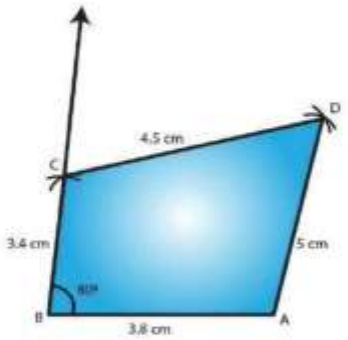
Step 2- Construct and angle of 80° at B.

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 ∠A = 45°.

Solution:

The given details are AB = 8 cm, BC = 8 cm, CD = 10 cm, AD = 10 cm and ∠A = 45°.

Steps to construct a quadrilateral:

Step 1- Draw a line AB = 8cm

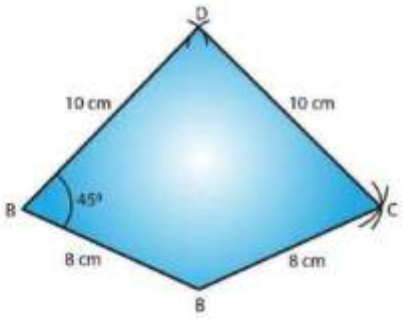
Step 2- Construct and angle of 45° at A.

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 ∠C = 120°.

Solution:

The given details are AB = 7.7 cm, BC = 6.8 cm, CD = 5.1 cm, AS = 3.6 cm and ∠C = 120°.

Steps to construct a quadrilateral:

Step 1- Draw a line DC = 5.1cm

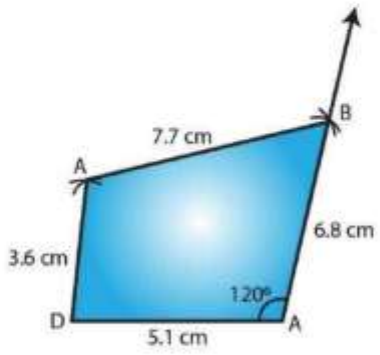
Step 2- Construct and angle of 120° at C.

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

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

Step 5- Cut an arc of radius 3.6cm 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 ∠B = 120°.

Solution:

The given details are AB = BC = 3 cm, AD = CD = 5 cm and ∠B = 120°.

Steps to construct a quadrilateral:

Step 1- Draw a line AB = 3cm

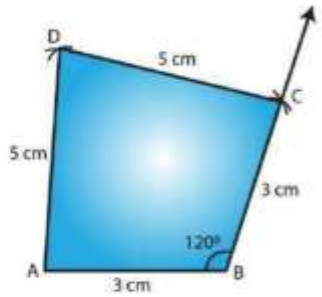
Step 2- Construct and angle of 120° at B.

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 ∠A = 60°.

Solution:

The given details are AB = 2.8 cm, BC = 3.1 cm, CD = 2.6 cm and DA = 3.3 cm and ∠A = 60°.

Steps to construct a quadrilateral:

Step 1- Draw a line AB = 2.8cm

Step 2- Construct and angle of 60° 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