Construction of Quadrilaterals

- A unique quadrilateral can be constructed, if any five measurements of the quadrilateral are given.
- **Construction of a quadrilateral when four sides and a diagonal are given:**

  Example:

  Construct a quadrilateral WXYZ, where WX = 4.5 cm, XY = 5 cm, YZ = 5.5 cm, ZW = 3 cm, and WY = 6 cm.

  Solution:

  Step 1:

  Draw a line WY of length 6 cm. Draw an arc of radius 4.5 cm with W as centre and another arc of length 5 cm with Y as centre. The intersection of the two arcs will be the point, X.

  Join WX and XY.

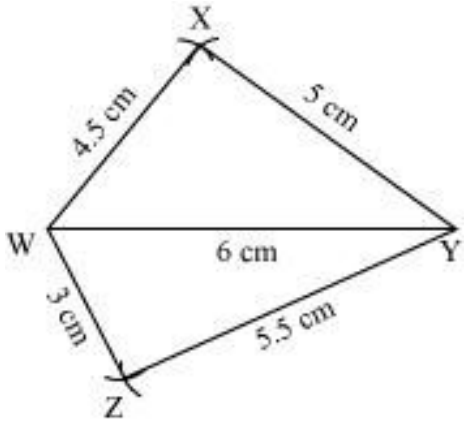
  Step 2:

  The point, Z, will be on the opposite side of point X with respect to WY.

  Draw an arc of length 3 cm taking W as centre and another arc of length 5.5 cm taking Y as centre. The intersection of these arcs will be the point, Z.

  Join WZ and YZ.

  WXYZ is the required quadrilateral.



- **Construction of a quadrilateral when two diagonals and three sides are given**

  Example:

  Construct a quadrilateral PQRS, where PR = 7 cm, QS = 8 cm, PQ = 5 cm, QR = 5 cm, and PS = 5.5 cm.

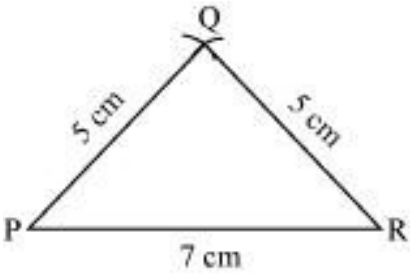
  Solution:

  The steps of constructing quadrilateral PQRS are as follows:

  Step 1:

  Draw a line PR of length 7 cm. Draw an arc of radius 5 cm taking P as centre and an arc of radius 5 cm taking R as centre. The point of intersection of these two arcs will be the point, Q.

  Join PQ and RQ.

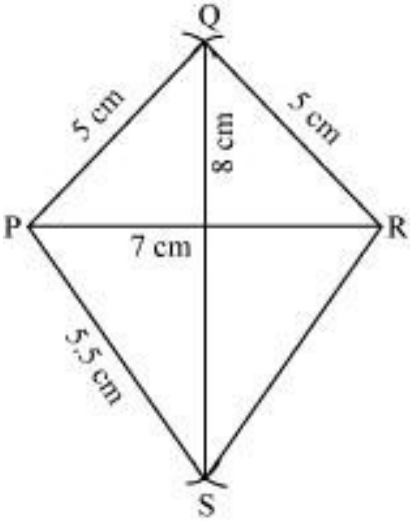


  Step 2:

  With Q as centre, draw an arc of radius 8 cm. The point, S, will lie on this arc.

  Then, taking P as centre, draw an arc of radius 5.5 cm. The intersection point of the two arcs will be the point, S.

  Join PS and RS.



PQRS is the required quadrilateral.

- **Construction of a quadrilateral when three sides and two included angles are given**

  Example:

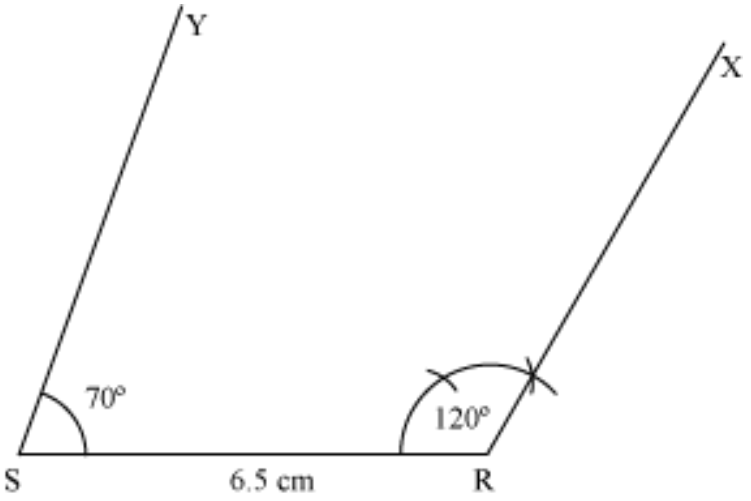
  Construct a quadrilateral PQRS with SR = 6.5 cm, PS = 5 cm, QR = 3 cm, ∠R = 120°, and ∠S = 70°.

  Solution:

  The steps of construction are as follows:

  Step 1:

  Draw SR = 6.5 cm. Draw ∠SRX = 120° at R and ∠RSY = 70° at S.

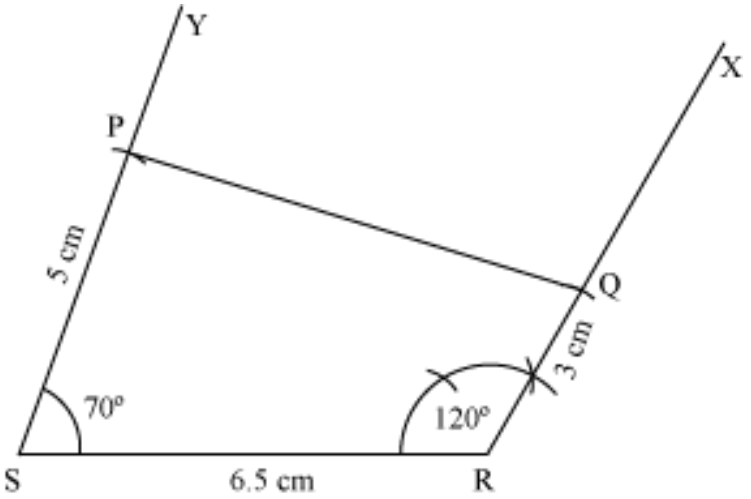


  Step 2:

  With S as centre, draw an arc of radius 5 cm intersecting SY at P.

With R as centre, draw an arc of radius 3 cm intersecting RX at Q.

Join PQ to obtain the required quadrilateral PQRS.



- **Construction of a quadrilateral when two adjacent sides and three angles are given:**

  Example:

  Construct a quadrilateral ABCD, where AB = 6 cm, AD = 4 cm, ∠A = 90°, ∠B = 105°, and ∠D = 60°.

  Solution:

  Step 1:

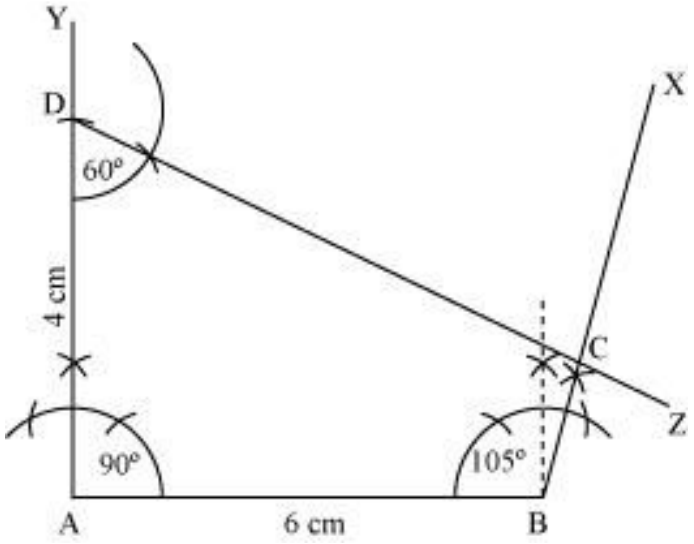
  Draw a line segment AB of length 6 cm. Make ∠ABX = 105° at B and ∠BAY = 90° at A.

  Step 2:

  With A as centre, draw an arc of radius 4 cm to cut the ray AY at point D. At D, draw∠ADZ = 60°.

  The point of intersection of the rays, BX and DZ, will be the point, C.

  ABCD is the required quadrilateral.


Y
D
60°
4 cm
X
C
Z
90°
105°
A
6 cm
B