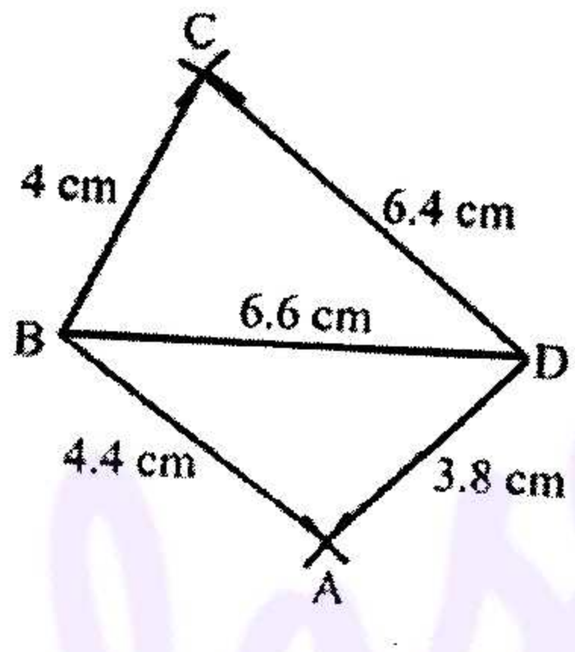
Chapter-18

Practical Geometry (Constructions)

Exercise 18.1

Q1 Construct a quadrilateral ABCD in which AB=4 BC = 4 cm, CD = 6.4 cm, DA = 3.8 cm and BD = 6.6 cm.

Solution:



Steps of Construction:

Step I: Draw $BD = 6.6$ cm

Step II: With B as the center and radius $BC = 4$ cm, draw an arc.

Step III: With D as the center and radius 6.4 cm, draw an arc to intersect the arc drawn in Step II at C.

Step IV: With B as the center and radius 4.4 cm, draw an arc on the side BD opposite to that of C.

Step V: With D as the center and radius 3.8 cm, draw an arc to intersect the arc drawn in Step IV at A.

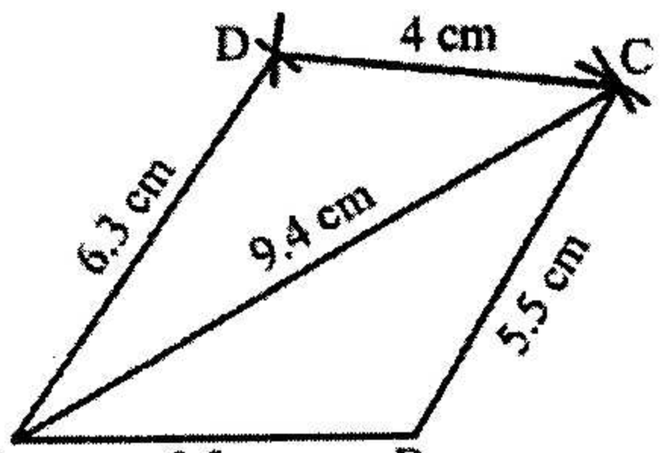
Step VI: Join BA, DA, BC and CD The quadrilateral $ABCD$ so obtained is the required quadrilateral.

Q2 Construct a quadrilateral ABCD such that AB=BC = 5.5 cm, CD = 4 cm, DA = 6.3 cm and AC = 9.4 cm. Measure BD.

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Question 2:



Solutions:

Steps of construction:

Step I: Draw $AB = 5.5\,\text{cm}$

Step II: With B as the center and radius $BC = 5.5$ cm, draw an arc.

Step III: With A as the center and radius $AC = 9.4$ cm, draw an arc to intersect the arc drawn in Step II at C.

Step IV: With C as the center and radius $CD = 4$ cm, draw an arc.

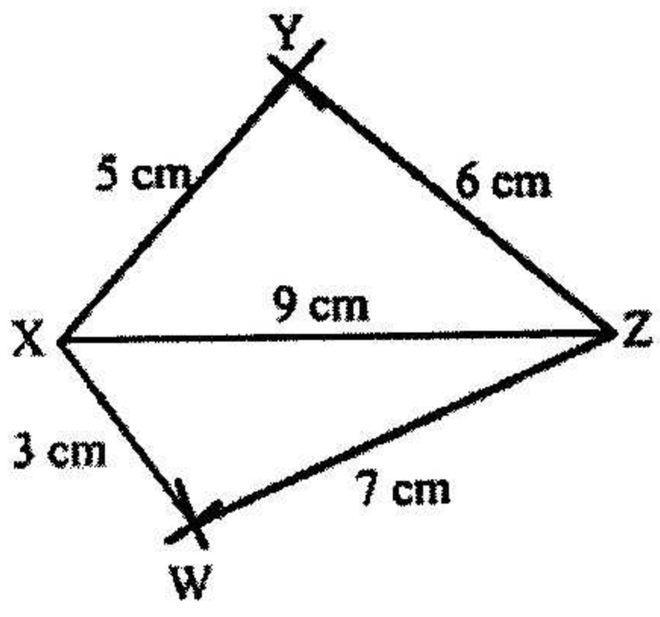
Step V: With A as the center and radius $AD = 6.3$ cm, draw an arc to intersect the arc drawn in Step IV at D.

Step VI: Join DA, BC, AC, and CD.

The quadrilateral ABCD so obtained is the required quadrilateral.

Q.3 Construct a quadrilateral XYZW in which XY = 5 cm, YZ = 6 cm, ZW = 7 cm, WX = 3 cm and XZ = 9 cm.

Sol



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Steps of construction:

Step I: Draw $XZ = 9$ cm

Step II: With X as the center and radius 5 cm, draw an arc above XZ.

Step III: With Z as the center and radius 6 cm, draw an arc to intersect the arc drawn in Step II at Y above XZ.

Step IV: With Z as the center and radius 7 cm, draw an arc below XZ.

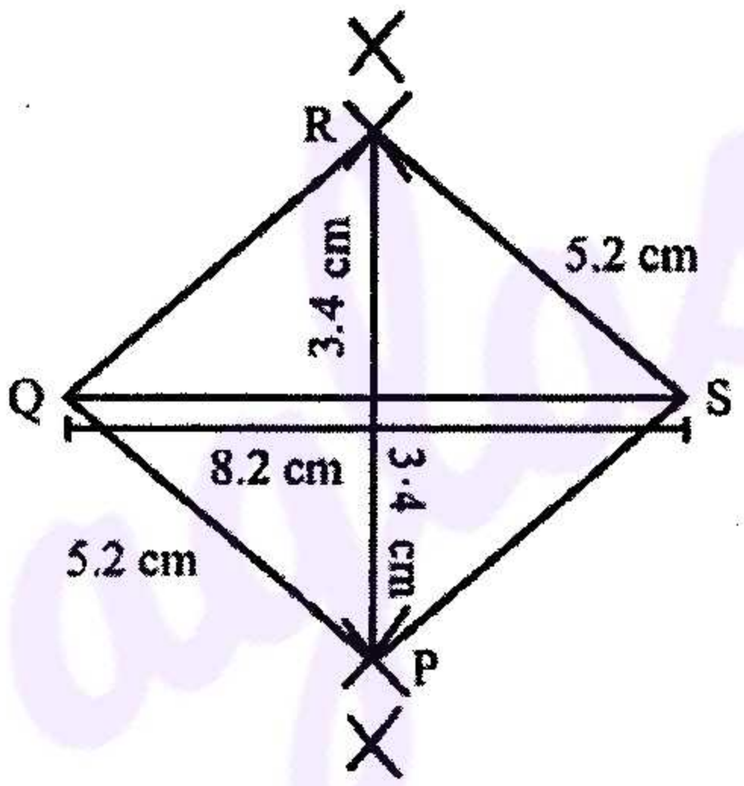
Step V: With X as the center and radius 3 cm, draw an arc to intersect the arc drawn in Step IV at W below XZ.

Step VI: Join XY, YZ, ZW, and XW.

The quadrilateral $WXYZ$ so obtained is the required quadrilateral.

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

Sol:



Steps of construction:

Step I: Draw $QS = 8.2$ cm

Step II: With Q as the center and radius 5.2 cm, draw an arc.

Step III: With S as the center and radius 5.2 cm, draw an arc to intersect the arc drawn in Step II at C.

Step IV: With P as the center and radius 6.8 cm.

Step V: With Q as the center and radius 5.2 cm, draw an arc to intersect the arc drawn in Step IV at A.

Step VI: Join QR, QP, PS, and SR.

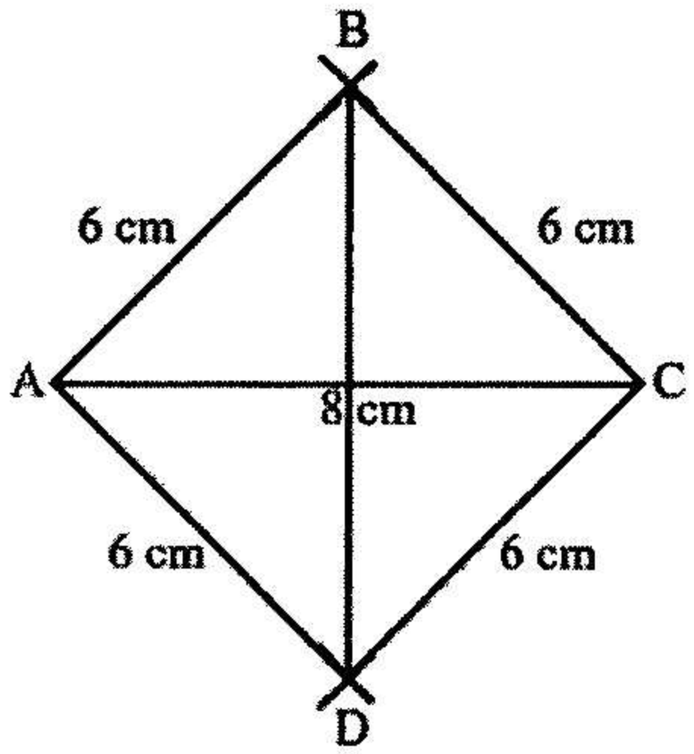
The quadrilateral $PQRS$ so obtained is the required quadrilateral.

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

Sol:



Solutions:

Steps of construction:

Step 1: Draw $AC = 8$ cm.

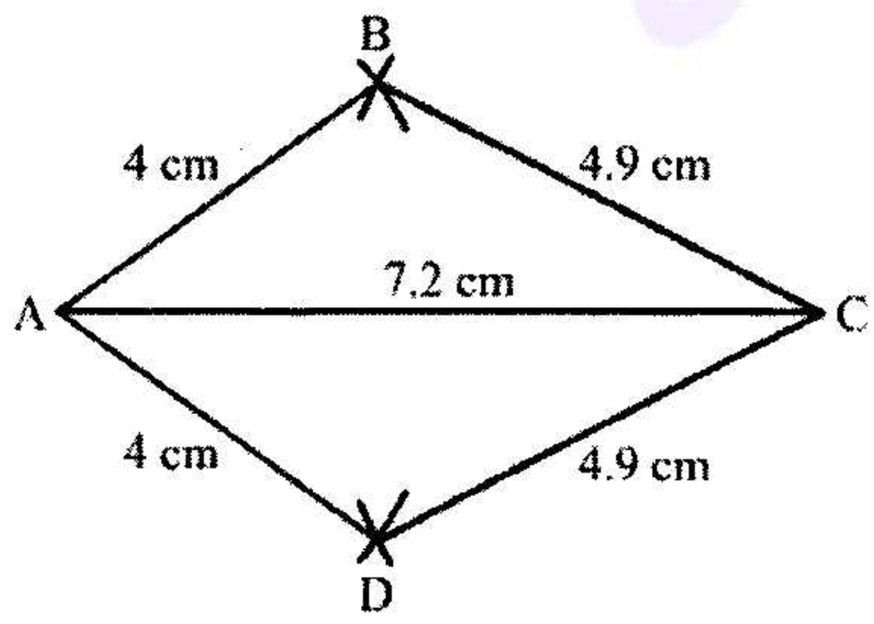
Step 2: With A as the centre and radius = 6 cm, draw arcs on both sides.

Step 3: With C as the center and radius = 6 cm, draw arcs on both sides, intersecting the previous arcs at points B and D.

Step 4: Join $BD = 8.9$ cm.

Thus, $ABCD$ is the required rhombus.

Question 6: Construct a kite ABCD in which AB=4cm BC=4.9cm and AC=7.2 cm.



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Solutions:

Steps of construction:

Step I: Draw $AC = 7.2$ cm.

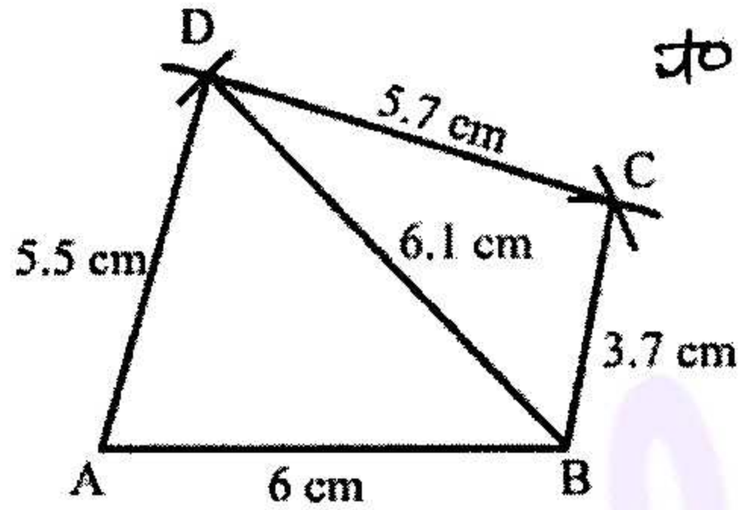
Step II: With A as the centre and radius 4cm, draw arcs on both sides of the line segment AC.

Step III: With C as the centre and radius 4.9 cm, draw arcs on both sides of AC intersecting the previous arcs of step II at B and D.

Step IV: Join BA, DA, BC and CD.

Thus, the quadrilateral $ABCD$ so obtained is the required kite.

Question 7: Construct if possible, a quad. ABCD given ~~cannot~~. 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 can not.



Solutions:

Steps of construction:

Step I: Draw $AB = 6$ cm.

Step II: With A as the center and radius 5.5 cm, draw an arc.

Step III: With B as the center and radius 6.1 cm, draw an arc to intersect the arc drawn in Step II at D.

Step IV: With B as the centre and radius 3.7 cm. draw an arc on the side.

Step V: With D as the centre and radius 5.7 cm, draw an arc to intersect the arc drawn in Step IV at C.

Step VI: Join BD, DA, BC and CD.

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Q8 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 $\triangle ACD$, $AD + CD < AC$.

Sol: Such a quadrilateral can not be constructed because in a triangle, the sum of the lengths of its two sides must be greater than that of the third side.

But in $\triangle ACD$

$AD + CD = 5.5 + 3 = 8.5$ cm, $AC = 11$ cm

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

So, the construction is not possible.

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