MATHS -7 (CH-10-PRACTICAL GEOMETRY)

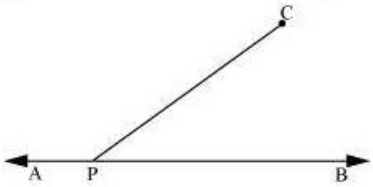
MATHS -7 (CH-10-10.1-PRACTICAL GEOMETRY)

Question 1:

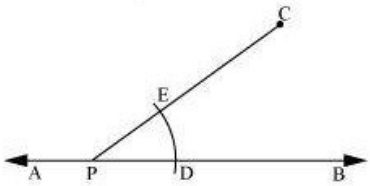
Draw a line, say AB, take a point C outside it. Through C, draw a line parallel to AB using ruler and compasses only.

Answer 1:

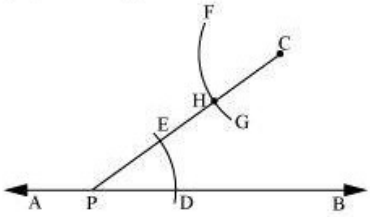
The steps of construction are as follows.
(i)Draw a line AB. Take a point P on it. Take a point C outside this line. Join C to P.



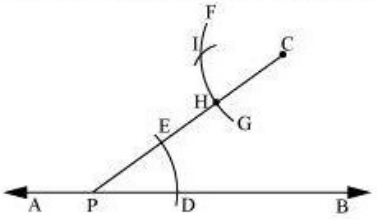
(ii)Taking P as centre and with a convenient radius, draw an arc intersecting line AB at point D and PC at point E.



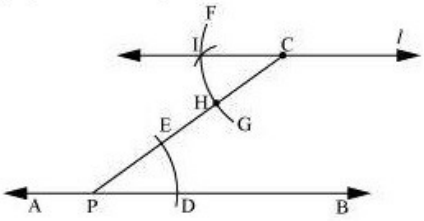
(iii) Taking C as centre and with the same radius as before, draw an arc FG intersecting PC at H.



(iv) Adjust the compasses up to the length of DE. Without changing the opening of compasses and taking H as the centre, draw an arc to intersect the previously drawn arc FG at point I.



(v) Join the points C and I to draw a line '*l*'.



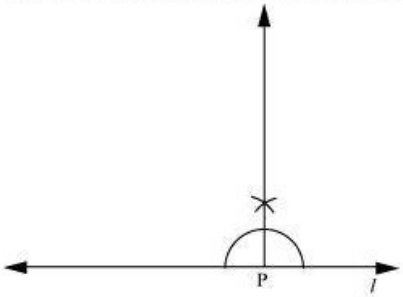
This is the required line which is parallel to line AB.

Question 2:

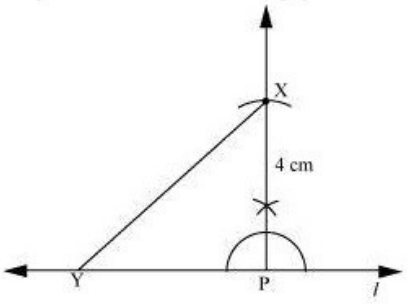
Draw a line *l*. Draw a perpendicular to *l* at any point on *l*. On this perpendicular choose a point X, 4 cm away from *l*. Through X, draw a line *m* parallel to *l*.

Answer 2:

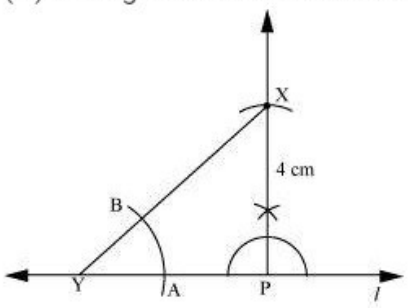
The steps of construction are as follows.
(i) Draw a line *l* and take a point P on line *l*. Then, draw a perpendicular at point P.



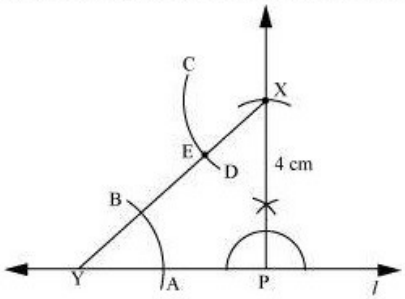
(ii) Adjusting the compasses up to the length of 4 cm, draw an arc to intersect this perpendicular at point X. Choose any point Y on line *l*. Join X to Y.



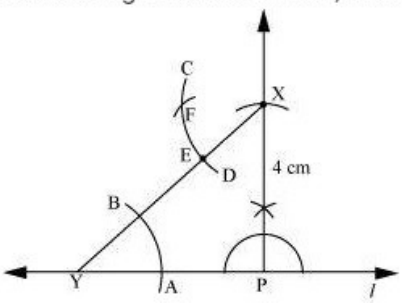
(iii) Taking Y as centre and with a convenient radius, draw an arc intersecting *l* at A and XY at B.



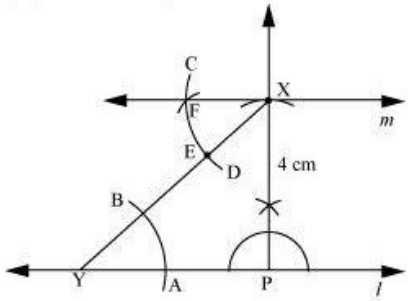
(iv) Taking X as centre and with the same radius as before, draw an arc CD cutting XY at E.



(v)Adjust the compasses up to the length of AB. Without changing the opening of compasses and taking E as the centre, draw an arc to intersect the previously drawn arc CD at point F.



(vi) Join the points X and F to draw a line *m*.



Line *m* is the required line which is parallel to line *l*.

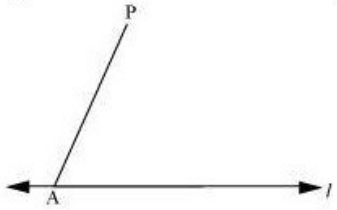
Question 3:

Let *l* be a line and P be a point not on *l*. Through P, draw a line *m* parallel to *l*. Now join P to any point Q on *l*. Choose any other point R on *m*. Through R, draw a line parallel to PQ. Let this meet *l* at S. What shape do the two sets of parallel lines enclose?

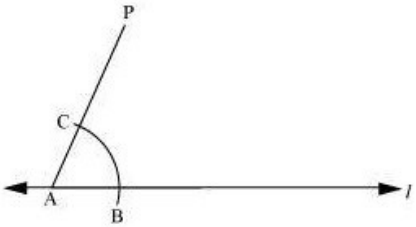
Answer 3:

The steps of construction are as follows.

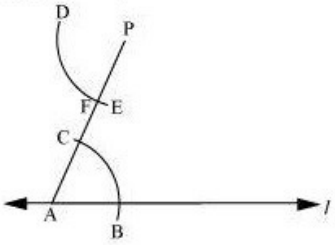
(i)Draw a line *l* and take a point A on it. Take a point P not on *l* and join A to P.



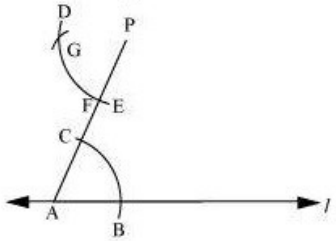
(ii) Taking A as centre and with a convenient radius, draw an arc cutting *l* at B and AP at C.



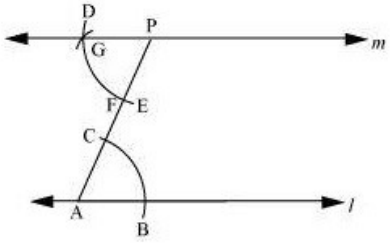
(iii)Taking P as centre and with the same radius as before, draw an arc DE to intersect AP at F.



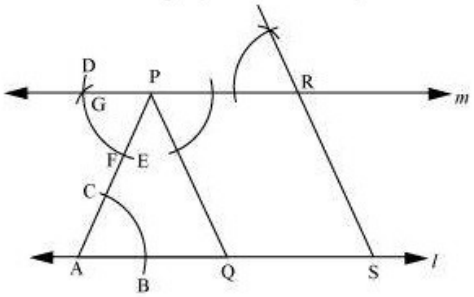
(iv) Adjust the compasses up to the length of BC. Without changing the opening of compasses and taking F as the centre, draw an arc to intersect the previously drawn arc DE at point G.



(v)Join P to G to draw a line *m*. Line *m* will be parallel to line *l*.



(vi)Join P to any point Q on line *l*. Choose another point R on line *m*. Similarly, a line can be drawn through point R and parallel to PQ.



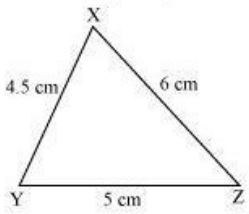
Let it meet line *l* at point S.
In quadrilateral PQSR, opposite lines are parallel to each other.
PQ || RS and PR || QS
Thus, the quadrilateral PQSR is a parallelogram.

Question 1:

Construct ΔXYZ in which XY = 4.5 cm, YZ = 5 cm and ZX = 6 cm.

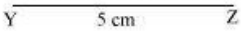
Answer 1:

The rough figure of this triangle is as follows.

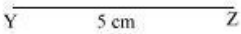


The required triangle is constructed as follows.

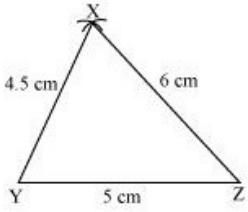
(i) Draw a line segment YZ of length 5 cm.



(ii) Point X is at a distance of 4.5 cm from point Y. Therefore, taking point Y as centre, draw an arc of 4.5 cm radius.



(iii) Point X is at a distance of 6 cm from point Z. Therefore, taking point Z as centre, draw an arc of 6 cm radius. Mark the point of intersection of the arcs as X. Join XY and XZ.



XYZ is the required triangle.

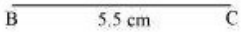
Question 2:

Construct an equilateral triangle of side 5.5 cm.

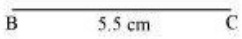
Answer 2:

An equilateral triangle of side 5.5 cm has to be constructed. We know that all sides of an equilateral triangle are of equal length. Therefore, a triangle ABC has to be constructed with AB = BC = CA = 5.5 cm.
The steps of construction are as follows.

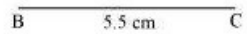
(i) Draw a line segment BC of length 5.5 cm.



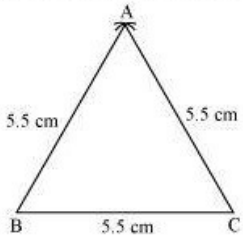
(ii) Taking point B as centre, draw an arc of 5.5 cm radius.



(iii) Taking point C as centre, draw an arc of 5.5 cm radius to meet the previous arc at point A.



(iv) Join A to B and C.



ABC is the required equilateral triangle.

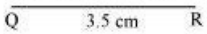
Question 3:

Draw ΔPQR with PQ = 4 cm, QR = 3.5 cm and PR = 4 cm. What type of triangle is this?

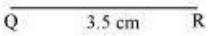
Answer 3:

The steps of construction are as follows.

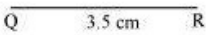
(i) Draw a line segment QR of length 3.5 cm.



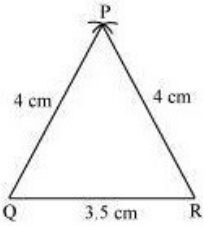
(ii) Taking point Q as centre, draw an arc of 4 cm radius.



(iii) Taking point R as centre, draw an arc of 4 cm radius to intersect the previous arc at point P.



(iv) Join P to Q and R.



ΔPQR is the required triangle. As the two sides of this triangle are of the same length (PQ = PR), therefore, ΔPQR is an isosceles triangle.

Question 4:

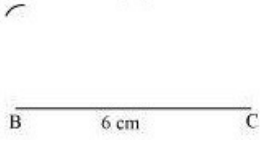
Construct ΔABC such that AB = 2.5 cm, BC = 6 cm and AC = 6.5 cm. Measure ∠B.

Answer 4:

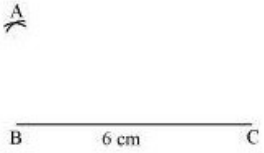
The steps of construction are as follows.

(i) Draw a line segment BC of length 6 cm.

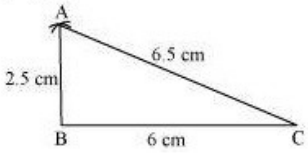
(ii) Taking point C as centre, draw an arc of 6.5 cm radius.



(iii) Taking point B as centre, draw an arc of radius 2.5 cm to meet the previous arc at point A.



(iv) Join A to B and C.



ΔABC is the required triangle. ∠B can be measured with the help of protractor. It comes to 90°.

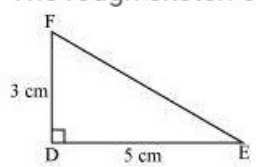
MATHS -7 (CH-10-10.3-PRACTICAL GEOMETRY)

Question 1:

Construct ΔDEF such that DE = 5 cm, DF = 3 cm and m∠EDF = 90°.

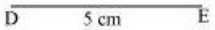
Answer 1:

The rough sketch of the required ΔDEF is as follows.

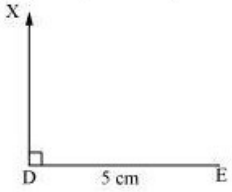


The steps of construction are as follows.

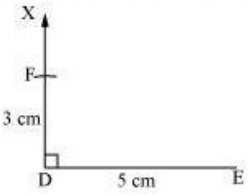
(i)Draw a line segment DE of length 5 cm.



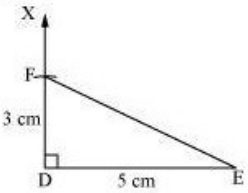
(ii) At point D, draw a ray DX making an angle of 90° with DE.



(iii) Taking D as centre, draw an arc of 3 cm radius. It will intersect DX at point F.



(iv) Join F to E. ΔDEF is the required triangle.

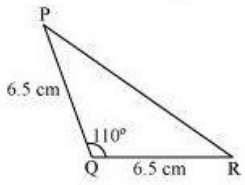


Question 2:

Construct an isosceles triangle in which the lengths of each of its equal sides is 6.5 cm and the angle between them is 110°.

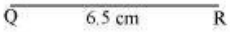
Answer 2:

An isosceles triangle PQR has to be constructed with PQ = QR = 6.5 cm. A rough sketch of the required triangle can be drawn as follows.

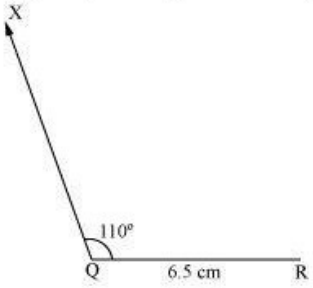


The steps of construction are as follows.

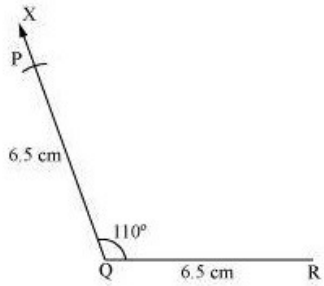
(i) Draw the line segment QR of length 6.5 cm.



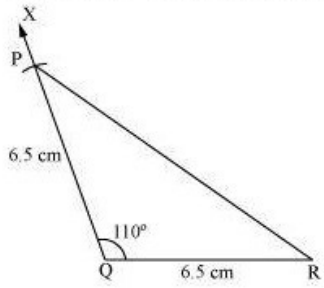
(ii) At point Q, draw a ray QX making an angle 110° with QR.



(iii) Taking Q as centre, draw an arc of 6.5 cm radius. It intersects QX at point P.



(iv) Join P to R to obtain the required triangle PQR.

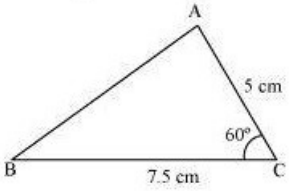


Question 3:

Construct ΔABC with BC = 7.5 cm, AC = 5 cm and m∠C = 60°.

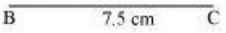
Answer 3:

A rough sketch of the required triangle is as follows.

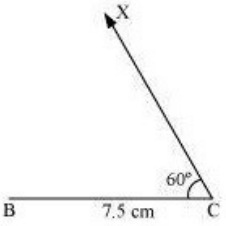


The steps of construction are as follows.

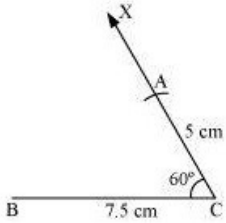
(i) Draw a line segment BC of length 7.5 cm.



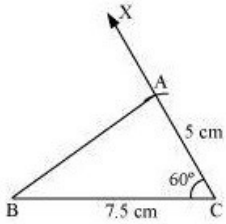
(ii) At point C, draw a ray CX making 60° with BC.



(iii) Taking C as centre, draw an arc of 5 cm radius. It intersects CX at point A.



(iv) Join A to B to obtain triangle ABC.



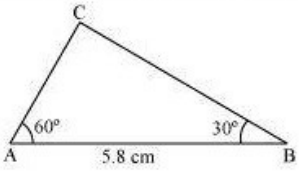
MATHS -7 (CH-10-10.4-PRACTICAL GEOMETRY)

Question 1:

Construct ΔABC, given m∠A = 60°, m∠B = 30° and AB = 5.8 cm.

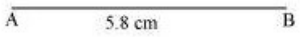
Answer 1:

A rough sketch of the required ΔABC is as follows.

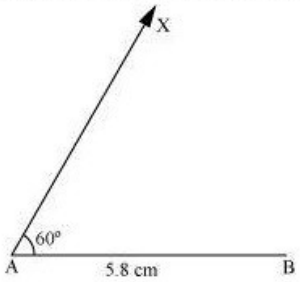


The steps of construction are as follows.

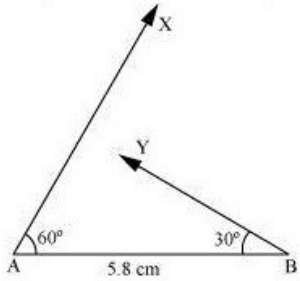
(i)Draw a line segment AB of length 5.8 cm.



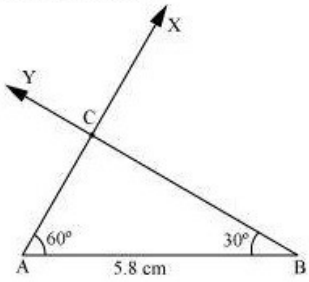
(ii)At point A, draw a ray AX making 60° angle with AB.



(iii) At point B, draw a ray BY, making 30° angle with AB.



(iv) Point C has to lie on both the rays, AX and BY. Therefore, C is the point of intersection of these two rays.



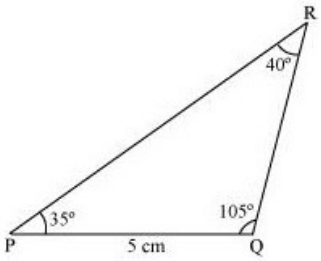
This is the required triangle ABC.

Question 2:

Construct ΔPQR if PQ = 5 cm, m∠PQR = 105° and m∠QRP = 40°.
(Hint: Recall angle sum property of a triangle).

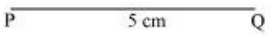
Answer 2:

A rough sketch of the required ΔPQR is as follows.

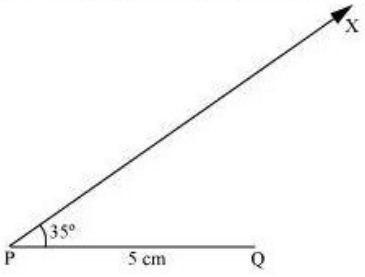


In order to construct ΔPQR, the measure of ∠RPQ has to be calculated.
According to the angle sum property of triangles,
∠PQR + ∠PRQ + ∠RPQ = 180°
105° + 40° + ∠RPQ = 180°
145° + ∠RPQ = 180°
∠RPQ = 180° − 145° = 35°
The steps of construction are as follows.

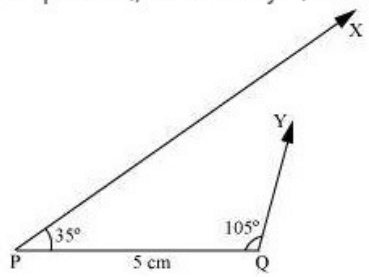
(i) Draw a line segment PQ of length 5 cm.



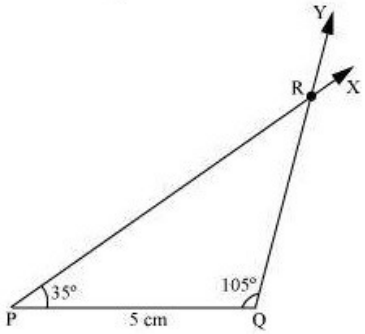
(ii) At P, draw a ray PX making an angle of 35° with PQ.



(iii) At point Q, draw a ray QY making an angle of 105º with PQ.



(iv)Point R has to lie on both the rays, PX and QY. Therefore, R is the point of intersection of these two rays.



This is the required triangle PQR.

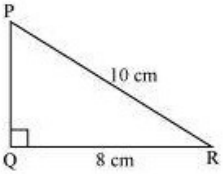
MATHS -7 (CH-10-10.5-PRACTICAL GEOMETRY)

Question 1:

Construct the right angled ΔPQR, where m∠Q = 90°, QR = 8 cm and PR = 10 cm.

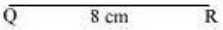
Answer 1:

A rough sketch of ΔPQR is as follows.

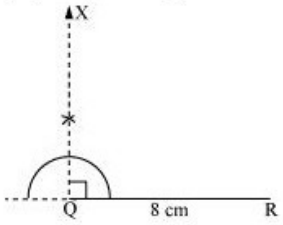


The steps of construction are as follows.

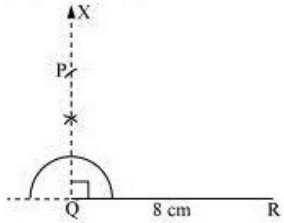
(i) Draw a line segment QR of length 8 cm.



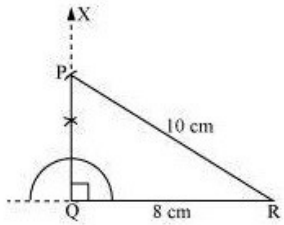
(ii) At point Q, draw a ray QX making 90° with QR.



(iii) Taking R as centre, draw an arc of 10 cm radius to intersect ray QX at point P.



(iv) Join P to R. ΔPQR is the required right-angled triangle.

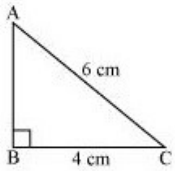


Question 2:

Construct a right-angled triangle whose hypotenuse is 6 cm long and one of the legs is 4 cm long.

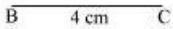
Answer 2:

A right-angled triangle ABC with hypotenuse 6 cm and one of the legs as 4 cm has to be constructed. A rough sketch of ΔABC is as follows.

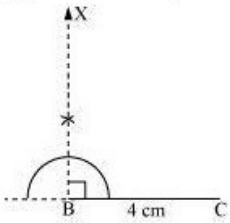


The steps of construction are as follows.

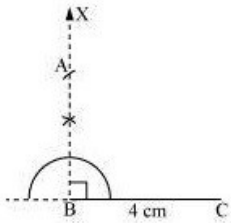
(i) Draw a line segment BC of length 4 cm.



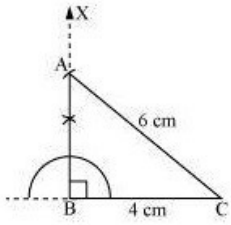
(ii) At point B, draw a ray BX making an angle of 90° with BC.



(iii) Taking C as centre, draw an arc of 6 cm radius to intersect ray BX at point A.



(iv) Join A to C to obtain the required ΔABC.

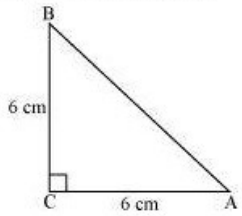


Question 3:

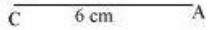
Construct an isosceles right-angled triangle ABC, where, m∠ACB = 90° and AC = 6 cm.

Answer 3:

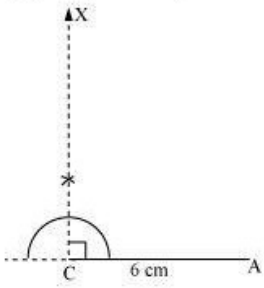
In an isosceles triangle, the lengths of any two sides are equal.
Let in ΔABC, AC = BC = 6 cm. A rough sketch of this ΔABC is as follows.



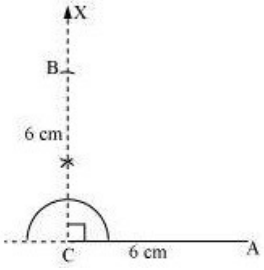
The steps of construction are as follows.
(i) Draw a line segment AC of length 6 cm.



(ii) At point C, draw a ray CX making an angle of 90° with AC.



(iii) Taking point C as centre, draw an arc of 6 cm radius to intersect CX at point B.



(iv) Join A to B to obtain the required ΔABC.