Unit No. 11
Loci And Construction
Exercise No. 11.1

Question No. 1.

Construct ΔABC with the given measurements and verify that the perpendicular bisectors of the triangle are concurrent.
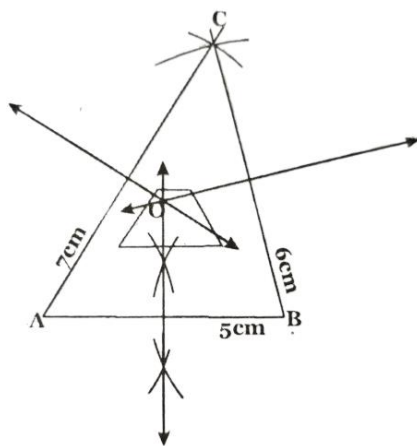
(i) m AB = 5 cm, m BC = 6 cm and m AC = 7 cm

Construction:

(i) Construct ΔABC with given measurements.

(ii) Draw right bisectors of sides AB, BC and CA of triangle.

(iii) All right bisectors meet at point O.

So right bisectors of sides of ΔABC are concurrent.
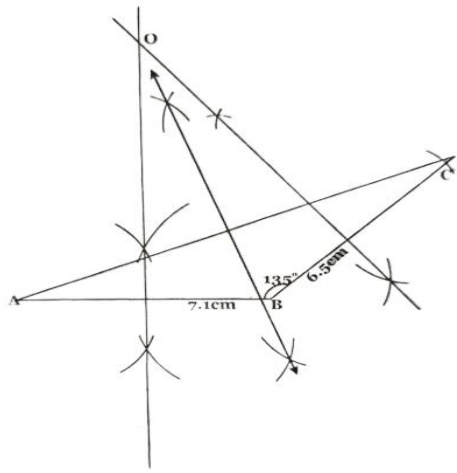
(Pass through same point.)

Figure:

(ii) m AB = 7.1cm, m ∠B = 135° and m BC = 6.5 cm

Construction Steps:

(i) Construct triangle according to measurement.

(ii) This is an obtuse angle triangle.

(iii) Draw perpendicular bisector of sides AB , BC and CA of triangle.

(iv) All perpendicular bisectors pass through same point O.

So perpendicular bisectors are concurrent.

Figure:

Question No. 2.

Construct ΔLMN of the following measurements and verify that the medians of the triangle are concurrent.

(i) m LM = 4.9 cm, m ∠L = 51° and m ∠M = 38°

Construction Steps:

(i) Construct ΔLMN according to given measurement.

(ii) Find mid points of all sides of ΔLMN.

(iii) Join mid points A, B, C with opposite vertices.

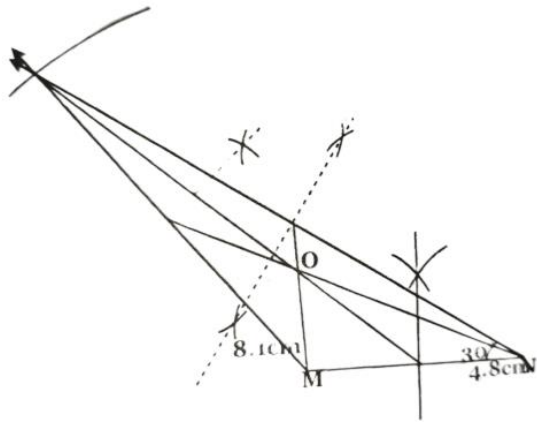**(iv) All medians pass through same point O. So, medians of triangle are concurrent.**

Figure:
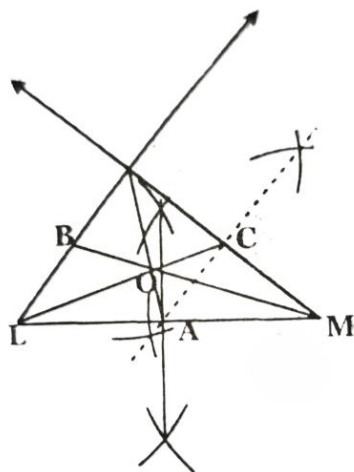
(ii) m MN = 4.8 cm, m ∠N = 30° and m LM = 8.1 cm

Construction Steps:

(i) Construct ΔLMN with give measurements.

(ii) Find mid points of all sides.

(iii) All these mid points are joined to opposite vertices. As all medians pass through same point O. So, medians are concurrent.
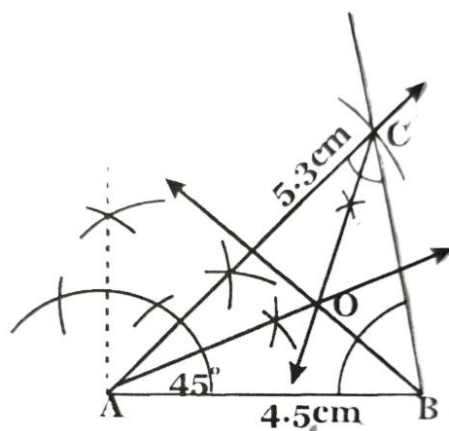
Figure:

Question No. 3.

Verify that the angle bisectors of ΔABC are concurrent with the following measurement:

(i) m AB = 4.5 cm, m ∠A = 45° and m AC = 5.3 cm

Construction Steps:

(i) Construct ΔABC according to given measurements.

(ii) Draw angle bisectors of each angle.

(iii) All these angle bisectors pass through the same point O. So, angle

bisectors are concurrent.

Figure:

(ii) m AB = 6 cm, m ∠A = 150° and m ∠B = 60°

Solution:

Sum of three angles of a triangle is 180°. But here sum of two given angles in 150° + 60° = 210° which is not possible. So, triangle is not possible to construct.

Hence no angle bisectors and so no point of concurrency exist here.

Question No. 4.

Given the measurements of ΔDEF: m DE = 4.8 cm, m EF = 4 cm and m ∠E = 45°, draw altitude of △DEF and find orthocentre.
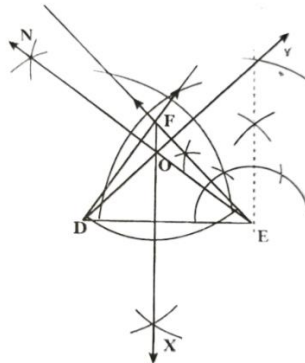
Construction Steps:

(i) Construct triangle DEF according to given measurements.

(ii) Draw altitudes FX, DY, EZ of the triangle. All these altitudes pass through same point O. Thus, altitudes of triangle are concurrent.

So, orthocentre is point "O".

Figure:

Question No. 5.

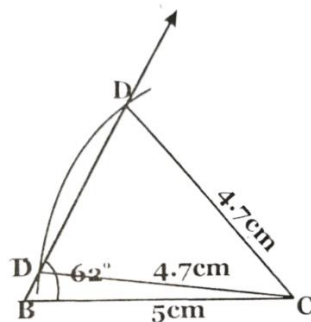**Construct the following triangles and find whether there exists any ambiguous case.**

(i) △BCD; m BC = 5 cm, m ∠B = 62° and m CD = 4.7 cm

Construction Steps:

(i) Construct triangle with the given measurements.

(ii) An arc of length 4.7cm C intersects angle arm of 62° at two distinct points D and D′. So here two triangles are constructed named as ∆BCD′ and ∆BCD.

Figure:

(ii) ∆KLM; m LM = 5 cm, m ∠M = 42° and m LN = 5 cm

Construction Steps:

(i) Construct triangle with given measurements.

(ii) An arc of length 5cm intersects angle arm at two distinct points D and D′. So we have two triangles named as ∆LMN and ∆LMN′.

Figure: