

Unit No. 11
Loci And Construction
Exercise No. 11.2

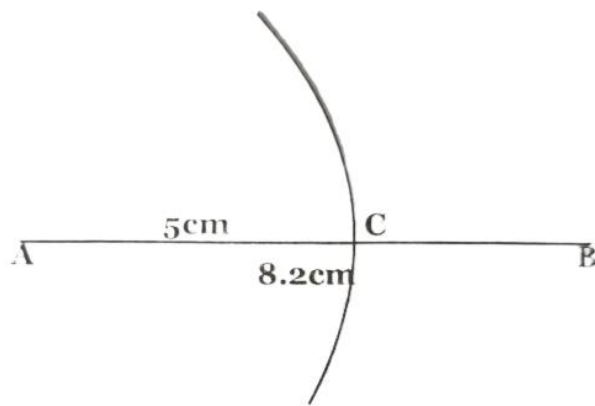
Question No. 1.

Two points A and B are 8.2 cm apart. Construct the locus of points 5 cm from point A.

Construction Steps:

- (i) Draw straight line segment such that; $m AB = 8.2 \text{ cm}$
- (ii): Take point A as centre, draw an arc of radius 5 cm which cuts line segment AB at point C. So, arc represents locus of points 5 cm from point A.

Figure:

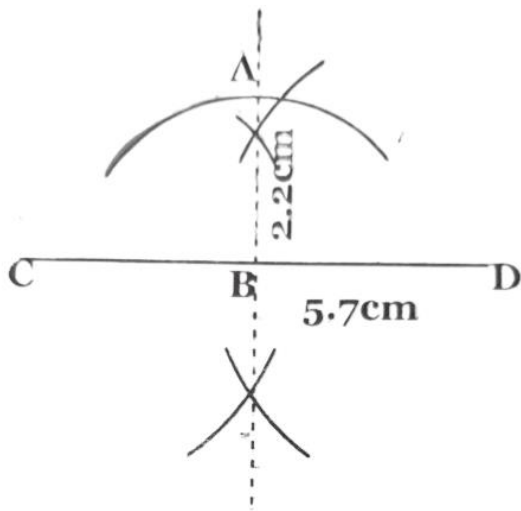


Question No. 2.

Construct a locus of point 2.2 cm from line segment CD of measure 5.7 cm.

Construction Steps:

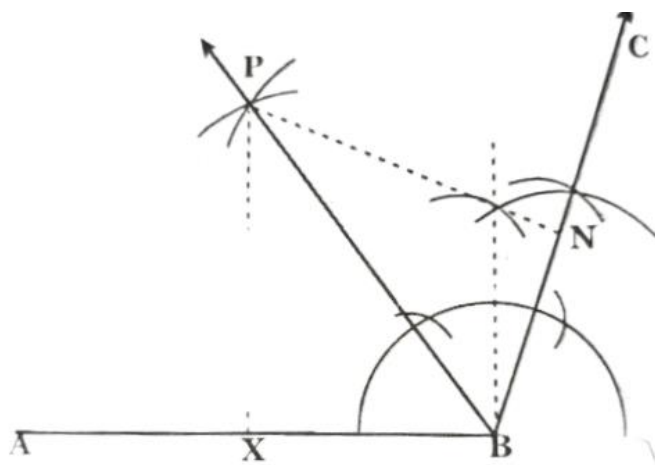
- (i) Draw a line segment such that; $m CD = 5.7 \text{ cm}$
- (ii): Draw perpendicular bisector of CD.
- (iii) AB is perpendicular bisector which meet CD at point B.
- (iv): Take point B as centre, draw an arc of radius 2.2 cm which cuts AB at A. which is the required locus of point 2.2 cm from line segment CD of measure 5.7 cm. Figure:



Question No. 3.

Construct an angle $ABC = 105^\circ$. Construct a locus of a point P which moves such that it is equidistant from BA and BC .

Figure:



Conclusion:

Point P lies on angle bisector of 105° . Which is equidistant from its angle arm. Here, $PX = PZ$

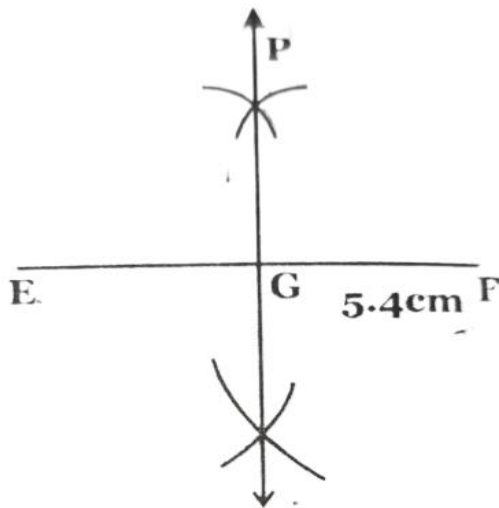
Question No. 4.

Two points E and F are 5.4 cm apart. Construct a locus of a point P which moves such that it is equidistant from E and F .

Solution Description:

Locus of point P whose distance from fixed points E and F is constant is the perpendicular bisector of the line segment EF .

Figure:



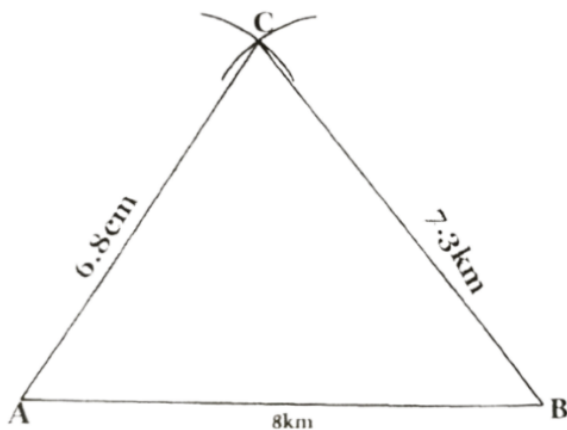
Question No. 5.

The island has two main cities A and B 8 km apart. Kashif lives on the island exactly 6.8 km from city A and exactly 7.3 km from city B. Mark with a cross the points on the island where Kashif could live.

Construction Steps:

- (i) Draw a line segment $AB = 8$ km. Here A, B represent two towns.
- (ii) Mark an arc of radius 6.8 km taking point A as centre.
- (iii) Mark an arc of radius 7.3 km taking point B as centre.
- (iv) Both arcs intersect each other at point C where Kashif could live.

Figure:



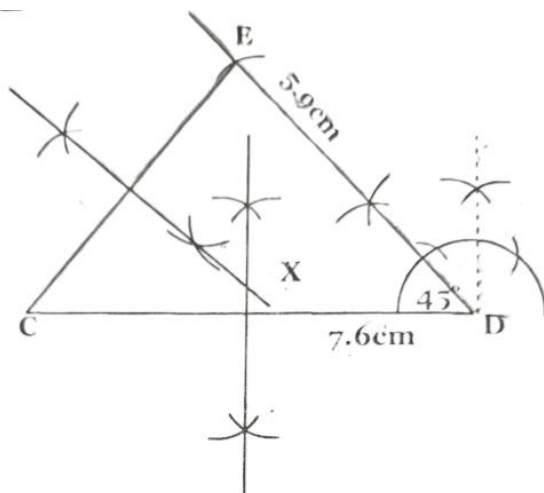
Question No. 6.

Construct a triangle CDE with $m\angle C = 76^\circ$, $m\angle D = 45^\circ$ and $m\angle E = 59^\circ$. Draw the locus of all points which are:

- (a) equidistant from C and D
- (b) equidistant from CD and CE

Mark the point X where the two loci intersect.

Figure:

**Conclusion:**

- (a) Locus of all points which are equidistant from C and D is perpendicular bisector of CD.
- (b) Both loci intersect each other at point X.

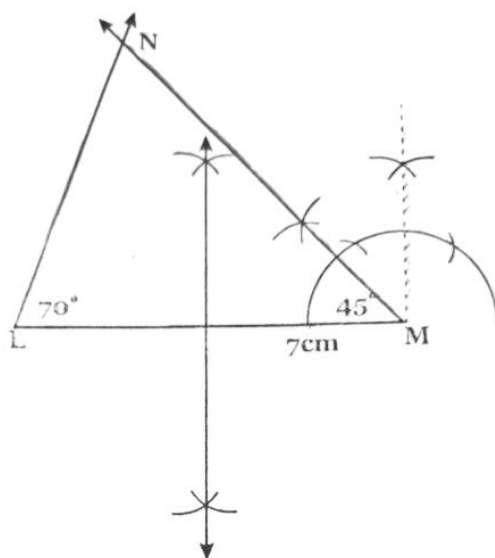
Question No. 7.

Construct a triangle LMN with $m \angle L = 70^\circ$, $m \angle M = 45^\circ$ and $m \angle N = 65^\circ$. Find a point within the triangle LMN which is equidistant from L and M and 3 cm from L.

Solution:

We cannot find point within the triangle which is equidistant from L and M and 3 cm from L.

Figure:

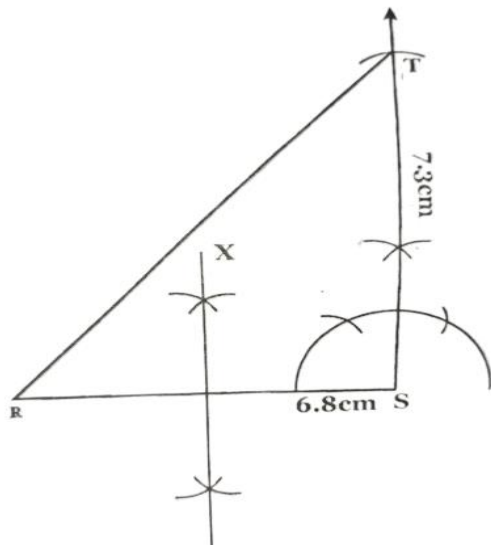
**Question No. 8.**

Construct a right-angled triangle RST with $m \angle S = 90^\circ$, $m \angle R = 30^\circ$ and $m \angle T = 60^\circ$. Find a point within the triangle RST which is equidistant from RS and RT and 4.5 cm from R.

Solution Description:

- (i) Construct right angled triangle RST. Draw perpendicular bisector of RS.
- (ii) Take point R as centre, mark an arc of radius 4.5 cm which cuts perpendicular bisector at point X.

Figure:



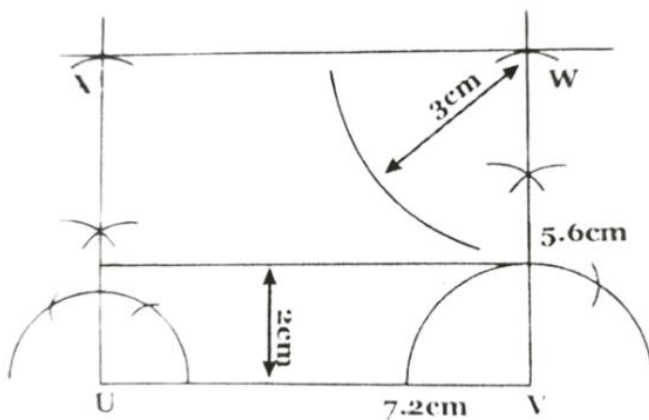
Question No. 9.

Construct a rectangle UVWX with $UV = 7.2$ cm and $m VW = 5.6$ cm. Draw the locus of points at a distance of 2 cm from UV and 3.5 cm from W.

Construction Step:

- (i) Construct a rectangle UVWX according to measurement.
- (ii) Draw a line parallel to UV at a distance 2 cm from UV.
- (iii) Take point W as centre, draw an arc of radius 3cm.

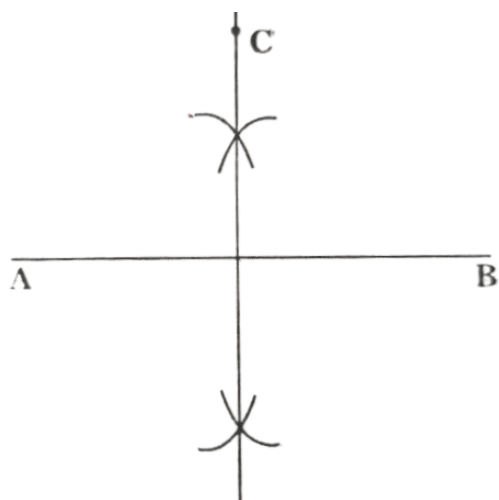
Figure:



Question No. 10.

Imagine two cell towers located at points A and B on a coordinate plane. The GPS-enabled device, positioned somewhere on the plane, receives signals from both towers. To ensure accurate navigation, the device is placed equidistant from both towers to estimate its position. Draw this locus of navigation.

Figure:



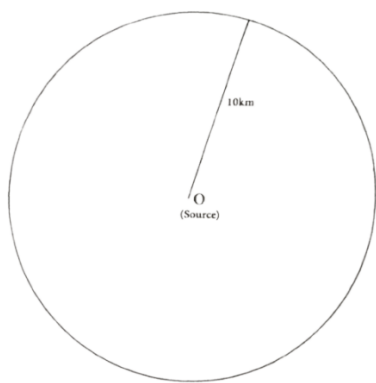
Conclusion:

Any point on perpendicular bisector is equidistant from end points of line segment. So, locus of navigation is the perpendicular bisector of AB. Point C is the position of device.

Question No. 11.

Epidemiologists use loci to determine infection zones, especially for contagious diseases, to predict the spread and take containment measures. In the case of a disease outbreak, authorities might determine a quarantine zone within 10 km of the infection source. Draw the locus of all points 10 km from the source defining the quarantine area to monitor and control the disease's spread.

Figure:



Conclusion:

In the diagram, let O be the infection source. We draw a circle of radius 10 km (5 cm) to determine quarantine zone which shows locus of all points 10 km from source defining the quarantine area to monitor and control the spread of disease.

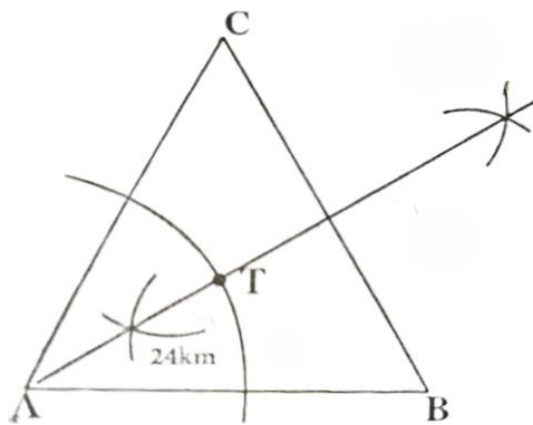
Question No. 12.

There is a treasure buried somewhere on the island. The treasure is 24 kilometres from A and equidistant from B and C. Using a scale of 1 cm to represent 10 km, find where the treasure could be buried.

Construction Steps:

- (i) Draw $\triangle ABC$ of any measurements.
- (ii) Draw perpendicular bisector of side BC.
- (iii) Draw locus of points 2.4km away from point A.
- (iv) The point of intersection of locus and \perp bisector give the point where treasure is buried.

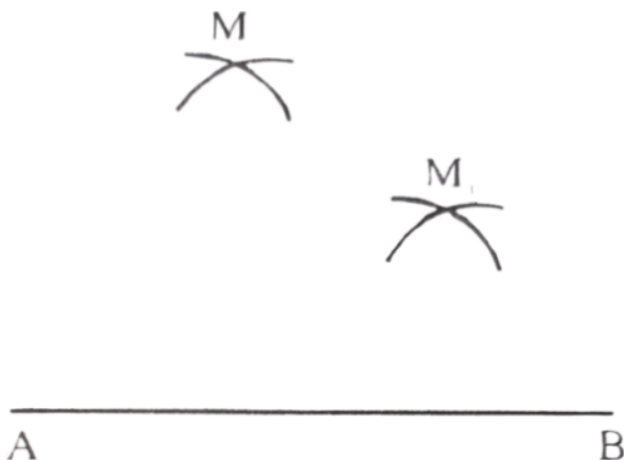
Figure:



Question No. 13.

There is an apple tree at a distance of 90 metres from banana tree in the garden of Sara's house. Sara wants to plant a mango tree M which is 64 metres from apple tree and between 54 and 82 metres from the banana tree. Using a scale of 1cm to represent 10m, Find the points where the mango tree should be planted.

Figure:



Conclusion:

"A" denotes apple tree. "B" denotes banana tree. Distance between apple tree and banana trees = 90 m (9 cm)

By given conditions, M_1 and M_2 are points where mango trees should be planted.