

# Activity 26

## OBJECTIVE

To construct an ellipse when two fixed points are given.

## MATERIAL REQUIRED

Rectangular cardboard, coloured chart paper, nails, strings, pen, pencil.

## METHOD OF CONSTRUCTION

1. Take a rectangular cardboard and paste a chart paper on it.
2. Draw a horizontal line on the chart paper and mark two fixed points  $F_1$  and  $F_2$  on it such that the distance between them is (say) 6 cm. Fix two nails at the points  $F_1$  and  $F_2$ .
3. Take a string whose length is more than the distance between the two fixed points (say) 9 cm.

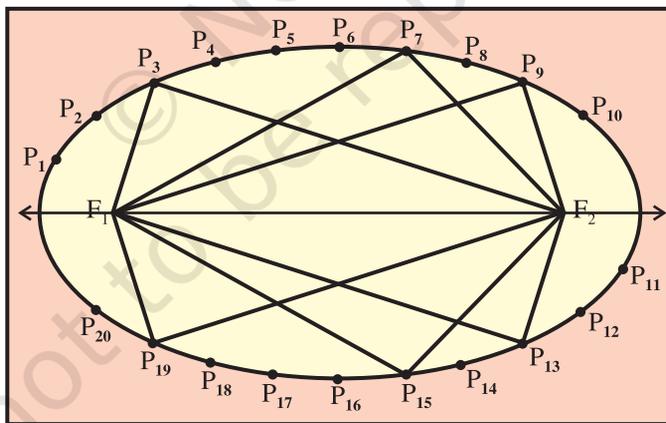


Fig. 26

## DEMONSTRATION

1. Fix the two ends of the string at the two nails at  $F_1$  and  $F_2$ .

2. With a pencil, stretch the string in the loop without slack and mark at least 10 points  $P_1, P_2, P_3, \dots$ , etc., on both sides of the line segment joining  $F_1$  and  $F_2$ .
3. Join all the points  $P_i, i = 1, 2, \dots, 20$  to form an ellipse.

### OBSERVATION

1.  $P_1F_1 + P_1F_2 = \underline{\hspace{2cm}}$  .
2.  $P_2F_1 + P_2F_2 = \underline{\hspace{2cm}}$  .
3.  $P_3F_1 + P_3F_2 = \underline{\hspace{2cm}}$  ,  $P_4F_1 + P_4F_2 = \underline{\hspace{2cm}}$  ,  $P_6F_1 + P_6F_2 = \underline{\hspace{2cm}}$  ,  $P_9F_1 + P_9F_2 = \underline{\hspace{2cm}}$  .
4.  $P_3F_1 + P_3F_2 = \underline{\hspace{2cm}} + P_4F_2 = P_{19}F_1 + \underline{\hspace{2cm}}$  .
5. Sum of the distances of each of the points  $P_1, P_2, P_3, \dots$  from the points  $F_1$  and  $F_2$  is            .

So, the curve obtained is an                            .

### APPLICATION

This activity can be used to explain the property of an ellipse, i.e., the sum of the distances of any point on the ellipse from its two foci is constant and is equal to length of major axis.

### NOTE

Construct another ellipse by taking different length of the string and also by changing the distance between  $F_1$  and  $F_2$ .