

Q) Two **fixed points** are 50 mm apart. Draw the locus of a point P moving in such a way that **difference of its distances** from the fixed points is always constant and is equal to 20 mm.

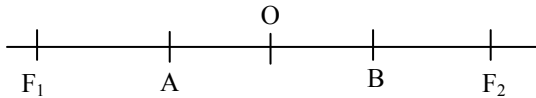
Ans) Since the **difference of distances** from two **fixed points** is always constant, the **fixed points** have to be the **foci** and the **curve** will be a **hyperbola**.

The equn of locus is $PF_1 - PF_2 = Const = 2a$. Hence the construction of the hyperbola is by arc of circles method similar to ellipse but the **foci** (F_1F_2) is larger than the **major axis** (AB).

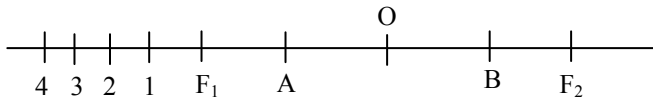
R)

1) Given data: $F_1F_2 = 50$; $AB = 20$.

Draw $AB = 20$ mm, $F_1F_2 = 50$ with mid point as O.

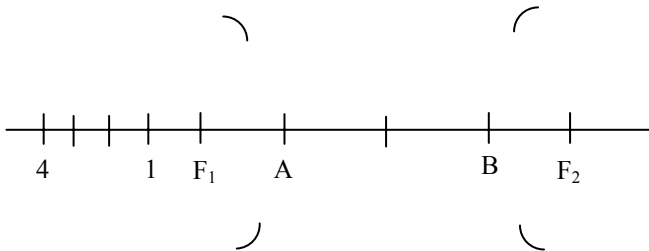


2) From F_1 , mark points at 10mm to left of F_1 and label them as 1,2,3,4,etc.

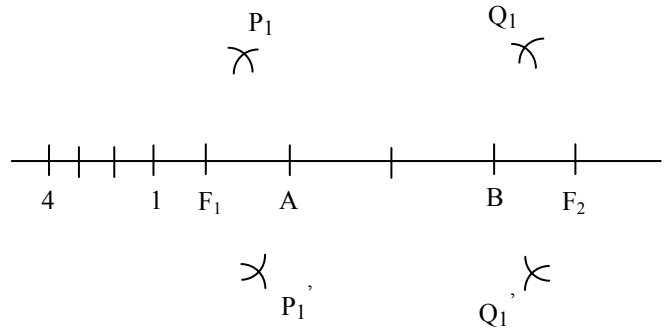


3) **Note:** For all arcs, use **Centre** (F_1, F_2) and **Radius** = (A_n, B_n);
E.g.: (A_1, B_1), (A_2, B_2), (A_3, B_3), (A_4, B_4)

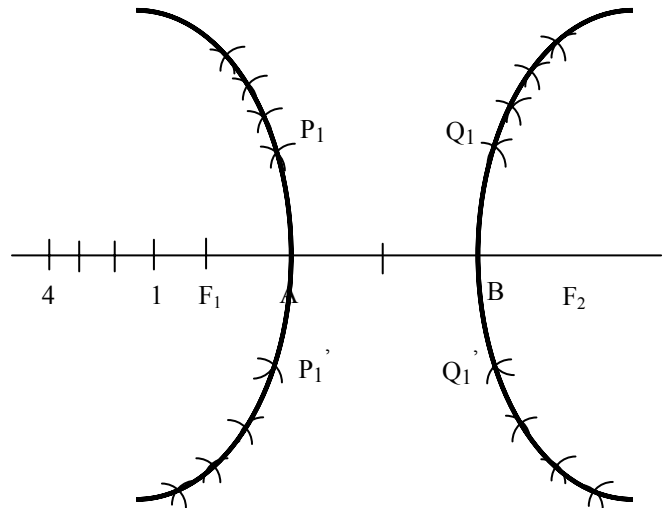
With **Centre** (F_1, F_2) & **Radius**= A_1 , draw 4 arcs.



5) With **Centre** (F_1, F_2) & **Radius**= B_1 , cut the 4 arcs to get points P_1, Q_1 , etc.



6) With **Centre** (F_1, F_2), $Rad = (A_2, B_2)$, (A_3, B_3), etc get the remaining points of **hyperbola** and join them.



NOTE:

If **sum of distances** from fixed points is constant, the **curve** is an **ellipse** and is to be drawn by arc of circles method.

If the **difference of distances** from fixed points is constant, the **curve** is **hyperbola**.

Both the curves have to be drawn by arc of circles method.