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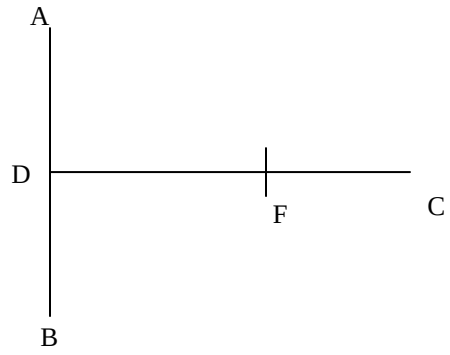
Q) A **fixed point** is 50 mm away from a **fixed line**. Draw the path traced by a point P moving such that its distance from the **fixed line** is **2/3** times its distance from the **fixed point**. Also draw **tangent** and **normal** to the curve at a point 65 mm from the directrix.

A) The fixed point is the focus and the fixed line is the directrix. The ratio is given as **PD=2/3 PF** from which **e= PF/PD=3/2(>1).** Hence the curve is a hyperbola with **e=3/2**.

1) Given data: **DF = 50; e=3/2(m/n).**
Draw AB (Directrix), CD (Axis) and Mark DF=50. (AB and CD are of any lengths).



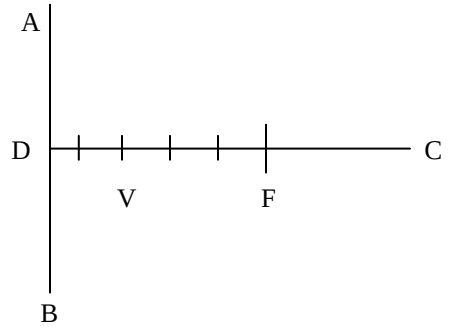
R)

S)

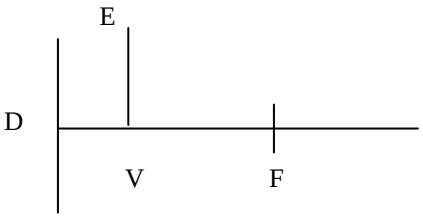
T)

U)

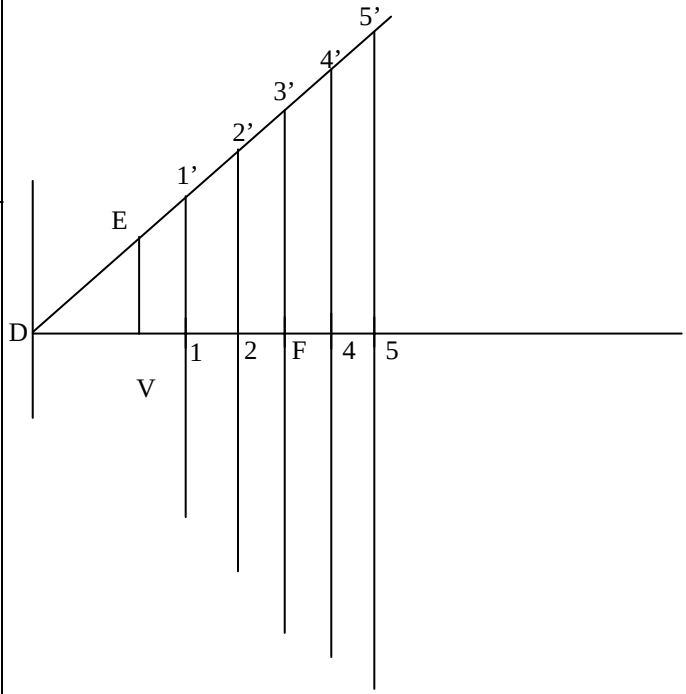
2) Divide DF into 3+2=5 parts. Mark V at 3rd part after F.
(Divide DF into (**m+n**) no.of parts. Mark **V** at **m**th part **after F**).



3) Draw VE=VF; VE is vertical line.



4) Join DE and extend it. After V, mark points 1, 2, 3, … at 10 mm from V.
On 1, 2, 3.., draw vertical lines to cut DE at 1', 2', 3', ..



5) With **Cen**tre as **F** & Radius =**1-1'**, cut arc on line 1-1' above and below to get P_1, P_1'. Similarly get the other points using 2-2', 3-3', etc. Join all points from V to get the required hyperbola.