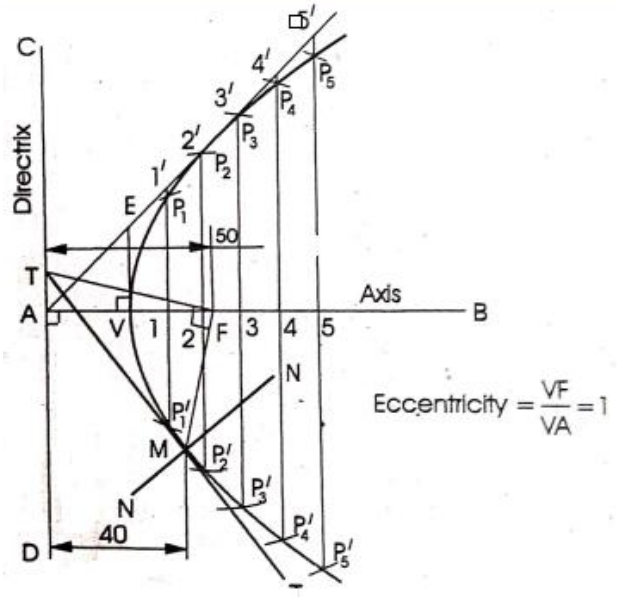
SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES.
(Autonomous)
DEPARTMENT OF MECHANICAL ENGINEERING

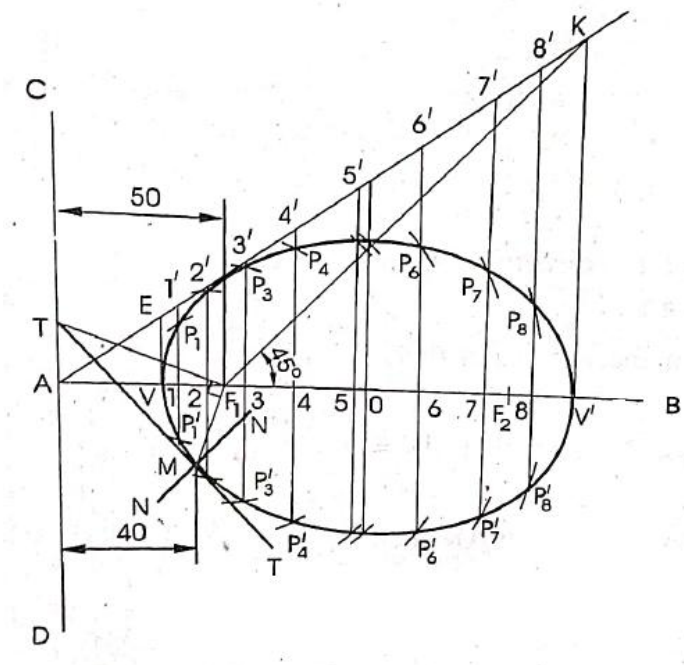
23ESC113– Engineering Graphics

Unit – I
ENGINEERING CURVES AND SCALES

1. **Construct a parabola, with the distance of the focus from the directrix as 50 mm. Also draw normal and tangent to the curve, at a point 40 mm from the directrix.**

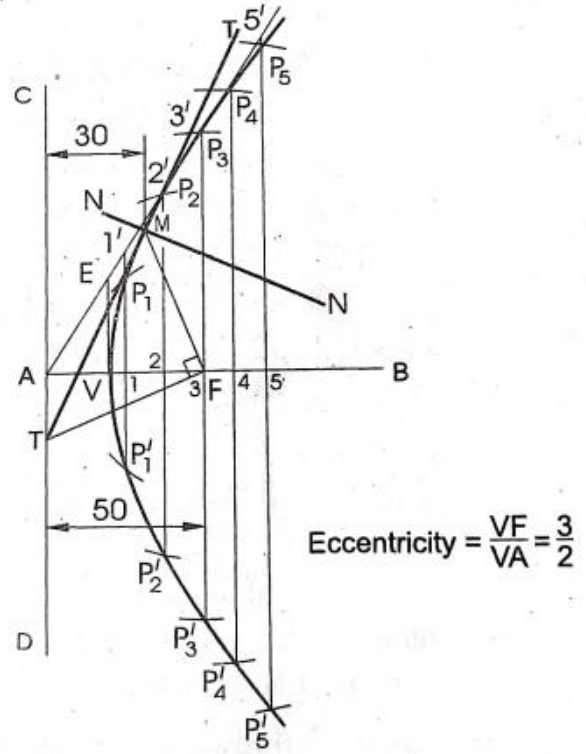


2. **Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as 2/3. Also, draw normal and tangent to the curve at a point 40 mm from the directrix.**



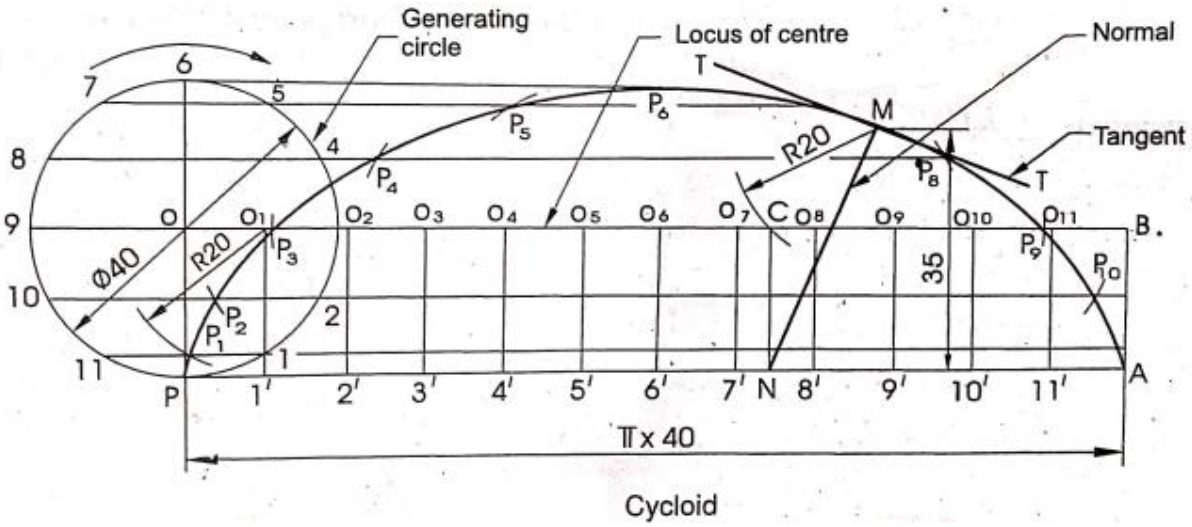
Construction of ellipse-Eccentricity method

3. **Construct a hyperbola, with the distance between the focus from the directrix as 50 mm and eccentricity as 3/2. Also, draw normal and tangent to the curve at a point 30 mm from the directrix.**



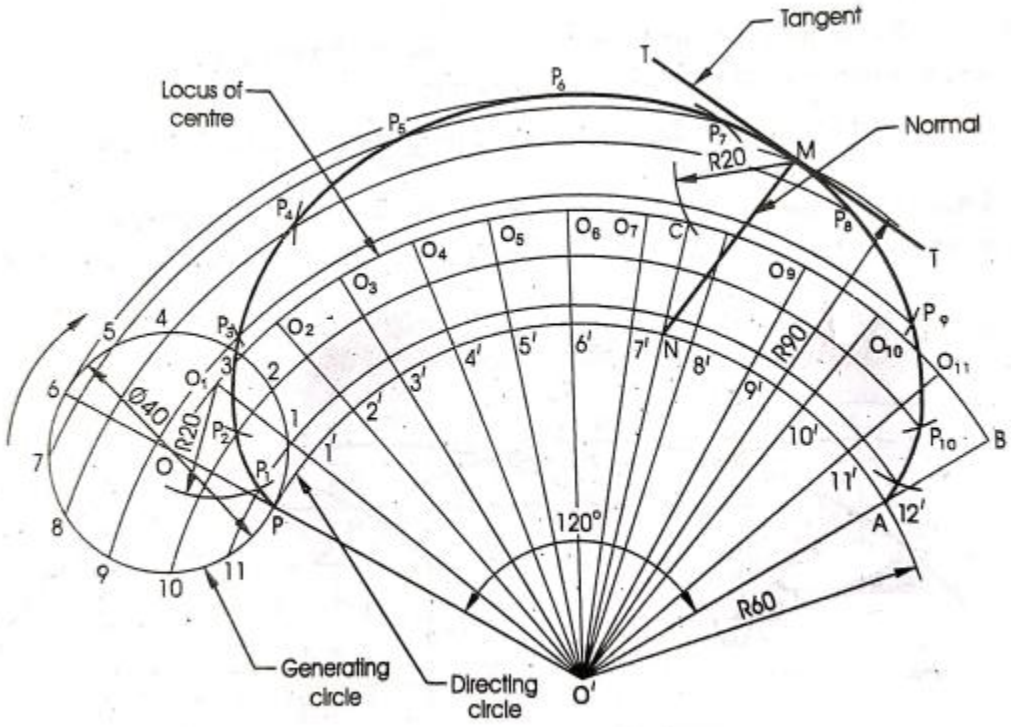
Construction of hyperbola- Eccentricity method

4. **Construct a cycloid, given the diameter of the generating circle as 40 mm. draw the tangent and normal to the curve at a point on it, 35 mm from the directing line.**



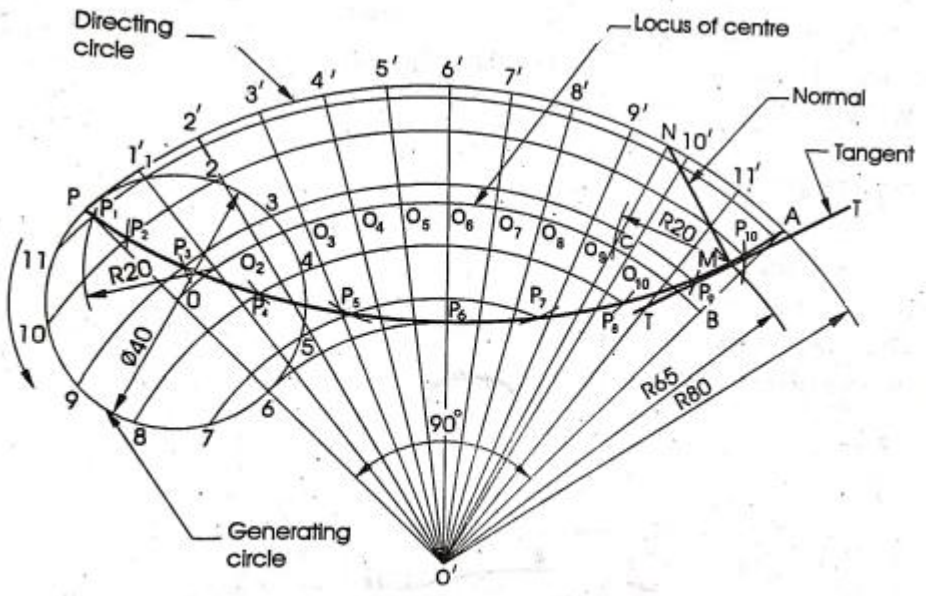
Cycloid

5. **Draw an epi-cycloid of a circle of 40 mm diameter, which rolls on another circle of 120 mm diameter for one revolution clock-wise. Draw a tangent and a normal to it at a point 95 mm from the centre of the directing circle.**



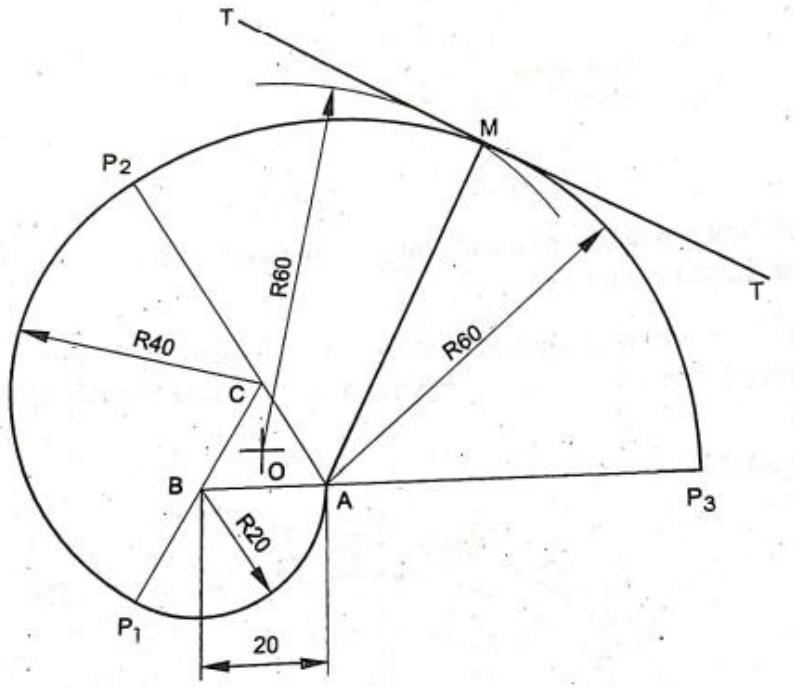
Epi-cycloid

6. **Draw a hypo-cycloid of a circle of 40 mm diameter, which rolls inside another circle of 160 mm diameter for one revolution counter clock-wise. Draw a tangent and a normal to it at a point 65 mm from the centre of the directing circle.**



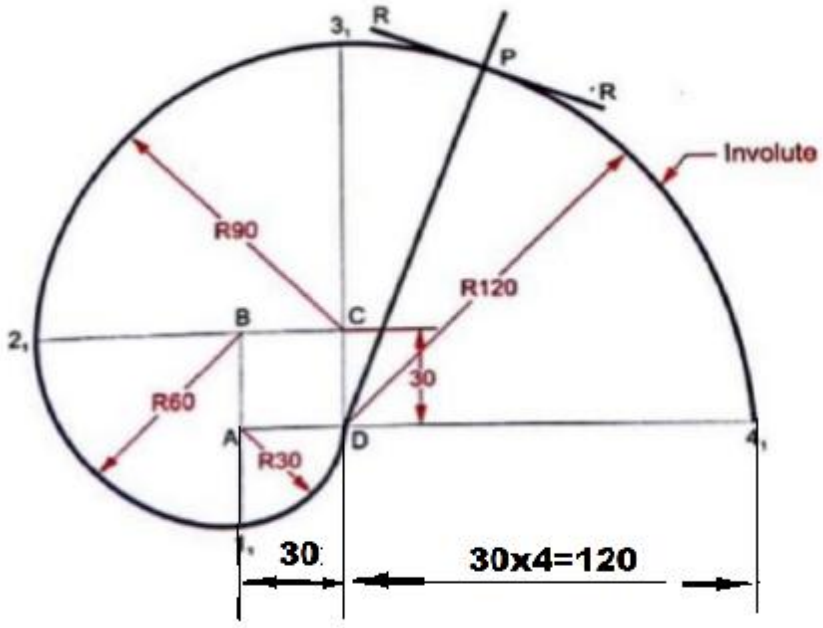
Hypo-cycloid

7. **Draw the involute of an equilateral triangle of side 20 mm and draw a normal and a tangent at a distance 60 mm from the centre of the triangle.**

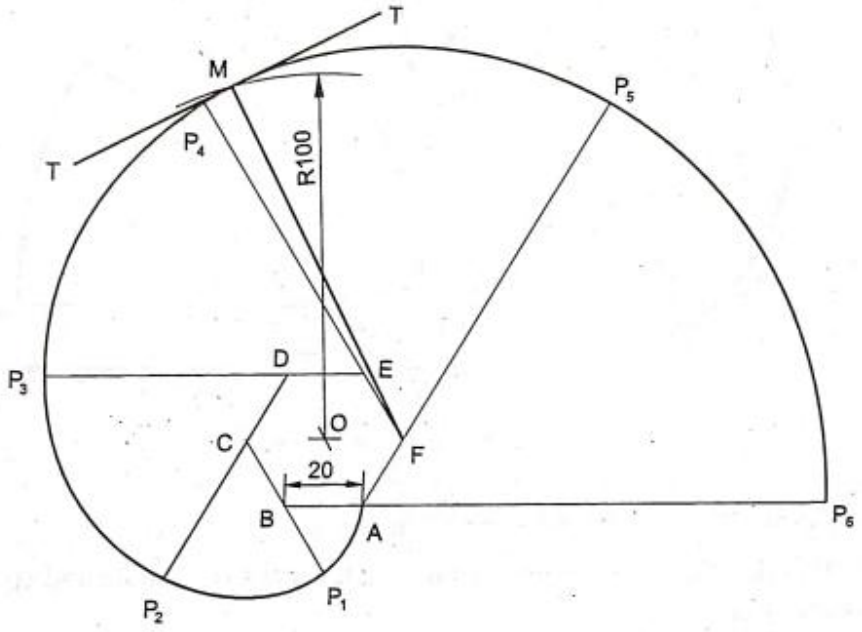


Involute of a triangle

8. **Draw an involute of a square of side 30 mm. Also draw the tangent and normal to any point on the curve.**

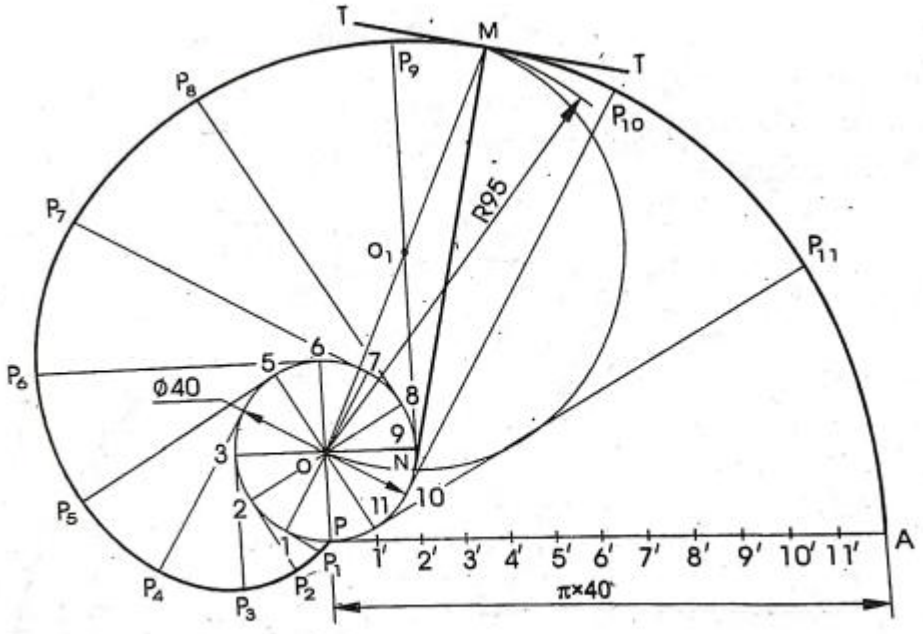


9. Draw the involute of a hexagon of side 20 mm. Also draw the tangent and normal to the curve at a distance 100 mm from the centre of the hexagon.



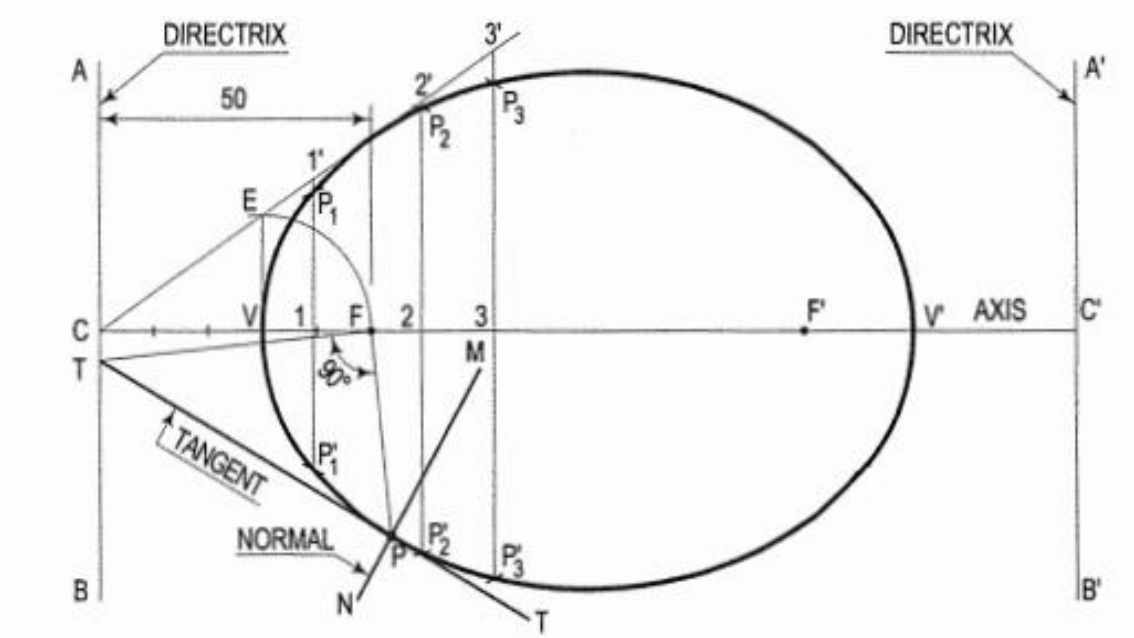
Involute of a hexagon

10. **Draw the involute of a circle of 40 mm diameter. Also draw the tangent and normal to the curve at a point 95 mm from the centre of the circle.**

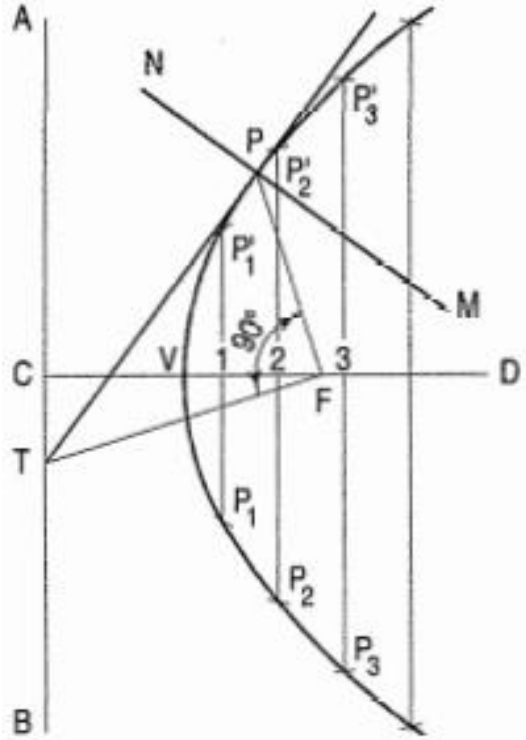


Involute of a circle

11. **Infer the construction of a curve, when the distance between the focus and directrix is 70 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.**

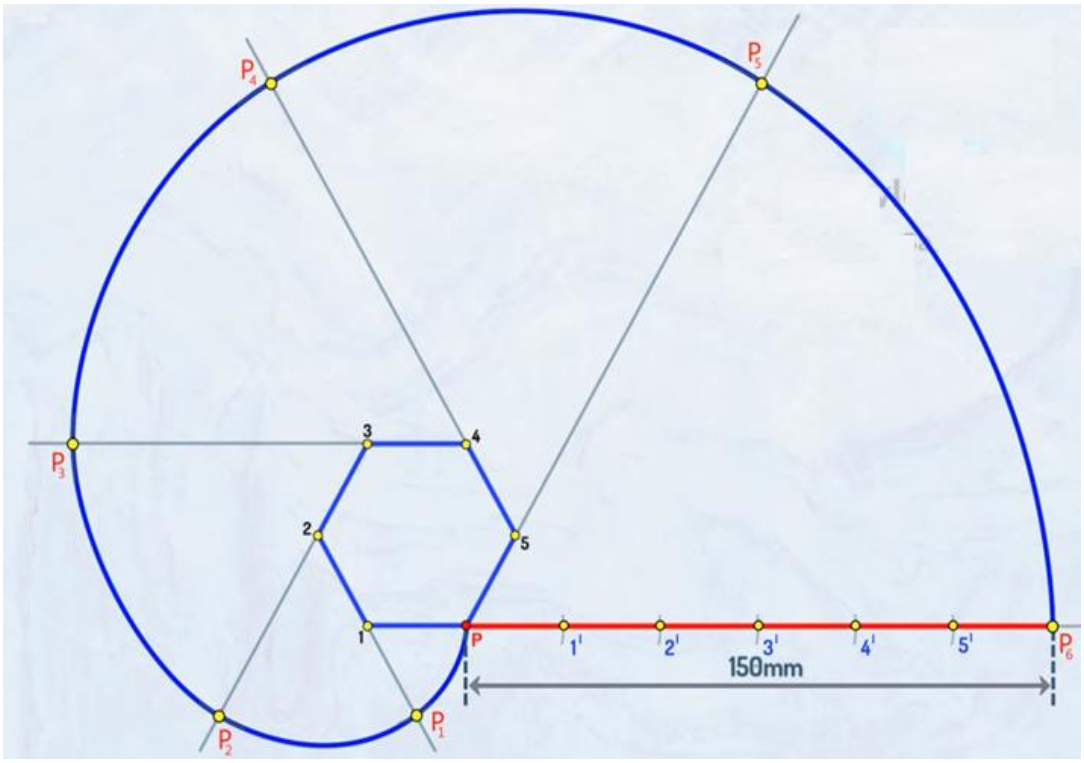


12. **Infer the construction of a curve when the distance between the focus and directrix is 50 mm. The curve intersecting on axis is equidistance from fixed line and fixed point. Name the curve and draw the tangent and normal to any point on the curve.**

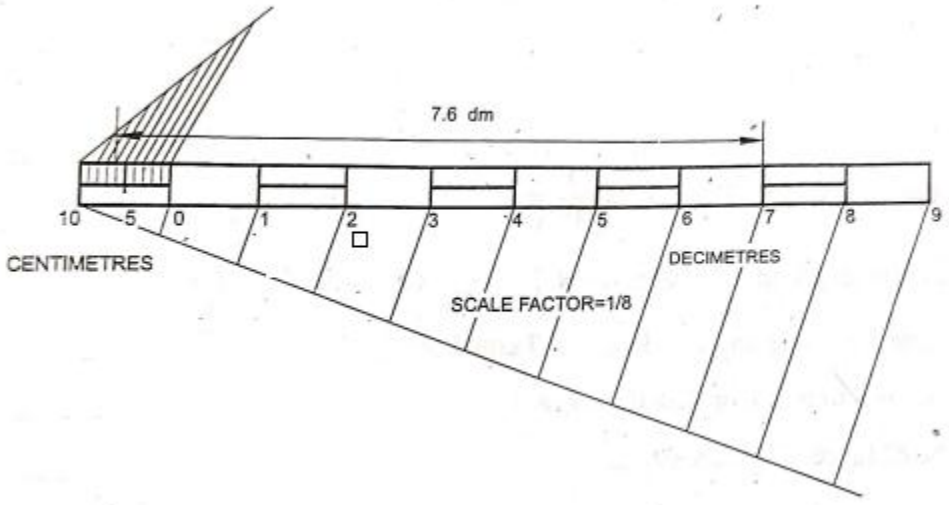


Directrix and focus

13. Draw an involute of a hexagon of base side 25 mm. Also draw the tangent and normal to any point on the curve.



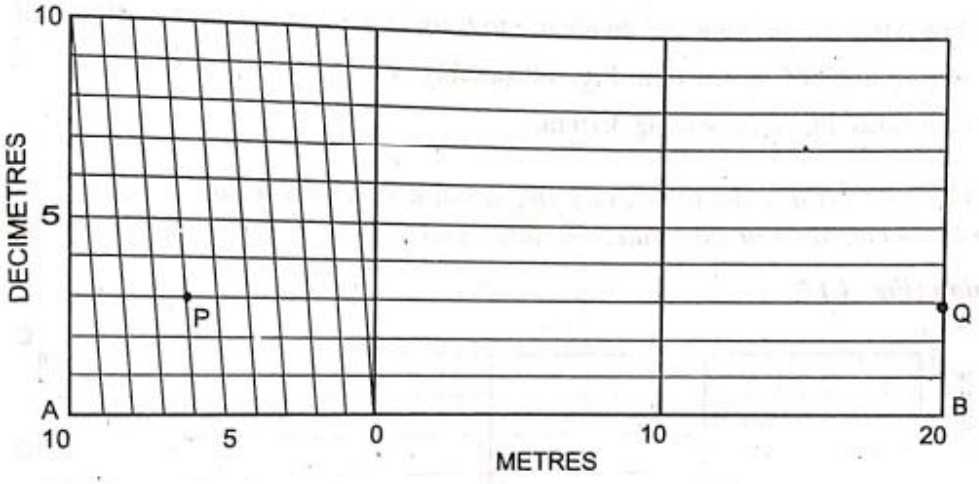
14. Construct a scale of 1:8 to show decimeters and centimeters and to read upto 1m. show a length of 7.6 dm on it.



Obtain the length of the scale:

Scale factor × length = $\frac{1}{8} \times 1000$ mm = 125 mm

15. On a map, the actual distance of 10 m is represented by a line of 50 mm long. Calculate the scale factor. Construct a diagonal scale, long enough to measure 30 m and mark on it, a distance of 26.3m.



S.F = 1/200 PQ = 26.3m

Fig. 4.10

1. Obtain the scale factor: $\frac{50}{10} \times \frac{1}{1000} = \frac{1}{200}$
2. Calculate the length of the scale: $\frac{1}{200} \times 30 \times 1000 = 150$ mm