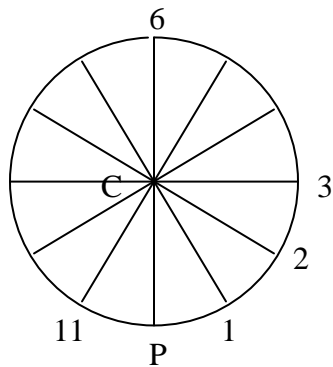


Q) A circle of 50 mm diameter rolls on a horizontal straight line without slipping. Trace the path of a point P on the circumference of the circle for one revolution of the circle. Name the curve. Also draw a tangent and normal to the curve at a point on it 30 mm above the base line. Take the generating point as bottommost point of circle.

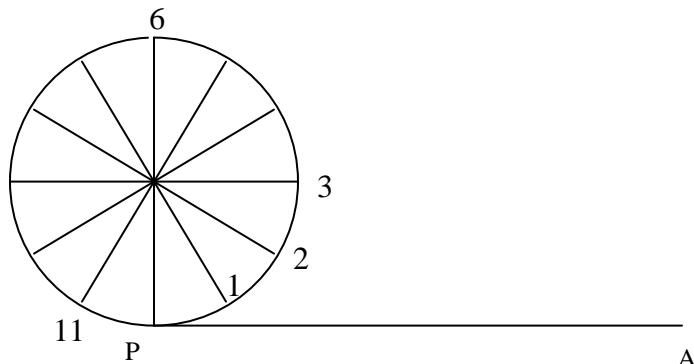
Ans) The **Curve** is a **cycloid** as the **circle** rolls along a **straight line** without slipping. The **length** for one revolution will be equal to $\pi * D$ (i.e. $3.14 * \text{Diameter of circle}$).

L = PA = 3.14 * 50 = 157mm.

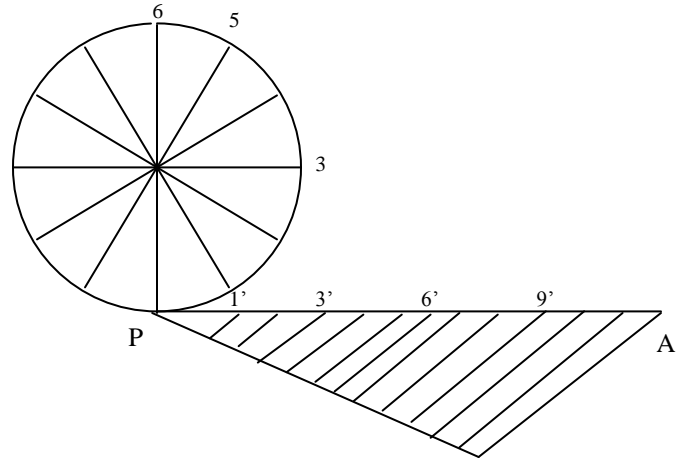
1) Draw a circle of 25 mm radius with centre C and mark P as the bottommost point. Divide the circle into 12 parts and label them as 1, 2, 3...12 after P. **3)4)**



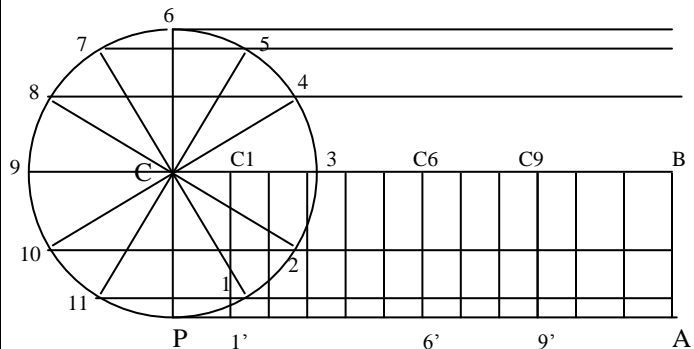
2) At P, draw a tangent PA (straight line) length for one revolution will be equal to $\pi * D$ (i.e. $PA=157$).



3) Divide the line PA into 12 equal parts by line division method if PA is not exactly divisible by 12. Name the points of line as 1', 2', 3', ..12'.



4) On 1-11, 2-10, 3-9, etc of circles, draw lines parallel to PA. On 1', 2', ..12' of PA, draw lines \perp to PA to cut center line CB at C₁, C₂.., C₁₂.



5) With C₁ as centre, CP(=25) as radius, cut arc on line 1-11 of circle. Similarly with C₂, C₃, etc as centers and rad= CP, cut arcs on 2-10, 3-9, to get the **cycloid**.

