

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
Department of Mechanical Engineering

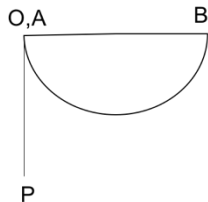
ME119 – Engineering Drawing and Graphics

2017-18 Semester II

Sheet 2: Engineering Curves

Instruction:

- Practice all problems in rough before coming to the Drawing Session.
 - For more details of the exercises in this sheet, refer Chapters 1 to 5 of the text book (N. D. Bhatt, Engineering Drawing, 50th Ed.).
 - Scale, dimension the drawings suitably. Label the important nodes/points on the drawings. Mention the scale if it is not 1:1
 - You may use the MIRROR command to reflect points around lines of symmetry
 - Make the title block and name plate before starting the drawing
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1. Draw a triangle AOB with $OA=30\text{mm}$, $OB=60\text{mm}$ and angle $AOB = 120^\circ$. Draw an Archimedean spiral passing through points O, A and B, with O as pole. At least 8 points should be used to draw the spiral – these points need not be labeled, but please label other relevant points in the figure.
2. A thin semicircular plate with diameter $AB=64\text{mm}$ is oriented as shown in the figure on the right. OP is an inelastic rope of 140mm length. End O of the rope is coincident with A, and the rope is wound anti-clockwise tightly onto the semicircle. Draw the locus of the point P as the rope is wound, until P touches the semicircle.
3. A circular coin of 40 mm diameter rolls over another circular coin of diameter 120 mm , which is fixed. A point on the circumference of the smaller coin is in contact with the circumference of the larger coin in the beginning and after one complete revolution. Draw the curve traced by the point. Use at least 8 points to draw the curve, and label all the relevant points.
4. Draw the hyperbola traced by a point P moving in a plane such that difference of the distances of P from the foci, spaced 80 mm apart, is 50 mm . Only one hyperbola needs to be drawn, using at least 8 points. Label all the points used for the construction.
5. Draw an ellipse if the distance of the focus from the directrix is 70 mm and the eccentricity is $\frac{3}{4}$. Also draw the tangent to the ellipse, located at a point 80 mm from the directrix. At least 12 points are required to draw the ellipse. Label the relevant construction points.
6. Draw a rectangle having sides 125 mm and 75 mm long. Inscribe 2 parabolas in it, with their axes bisecting each other. Use at least 8 points to draw each parabola, and label the relevant construction points.