

S. V. National Institute of Technology, Surat

Applied Mathematics and Humanities Department

B.Tech-I

Sem-1

Branch-All

Subject-Mathematics-I (MA 101 S1)

Tutorial - 7 : Curve Tracing; Cartesian, polar and parametric form of standard curves.

✓ (1) Draw the circle $x^2 + y^2 - 4x + 4y + 4 = 0$.

✓ (2) Sketch the following curves:

i. $y^2 + 4x - 4y + 8 = 0$.

ii. $x^2 + 4x - 4y + 16 = 0$.

✓ (3) Trace the curve: $y^2(2a - x) = x^3$.

✓ (4) Trace the curve: $y^2x = a^2(a - x)$.

✓ (5) Trace the curve: $x^{1/2} + y^{1/2} = a^{1/2}$.

✓ (6) Trace the curve: $y = 2x + \frac{x^2}{2} - \frac{x^3}{3}$

✓ (7) Trace the curve: $r = a(1 + \cos\theta)$

✓ (8) Trace the curve: $r = ae^{\theta \cot \alpha}$; $\alpha > 0$, (Equiangular spiral)

✓ (9) Trace the curve: $r(1 + \cos\theta) = 2a$ (Parabola opening on left)

✓ (10) Trace the curve: $x = acost + \frac{1}{2} \log \tan^2 \left(\frac{t}{2} \right)$, $y = asint$

✓ (11) Sketch the following curves:

i. $x = asin2\theta(1 + \cos2\theta)$, $y = acos2\theta(1 - \cos2\theta)$

ii. $r = \frac{\sin^2\theta}{\cos\theta}$

✓ (12) Trace the curve: $x = a(t + sint)$, $y = a(1 + cost)$

✓ (13) Trace the curve: $x = acos^3t$, $y = asin^3t$ (Cartesian form : $x^{2/3} + y^{2/3} = a^{2/3}$)
