28-11-20

B.Sc PART-I

Curve tracing

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Well known polar Curves

1.) Classes of the curves $r = a\sin n\theta$

These curves are closed curves and loops are formed about the origin. If n is odd, then there are n loops, but if n is even there are $2n$ loops. The order in which the loops are described as θ increases from 0 to 2π is indicated in figure by numbers (1, 2, ——— etc)

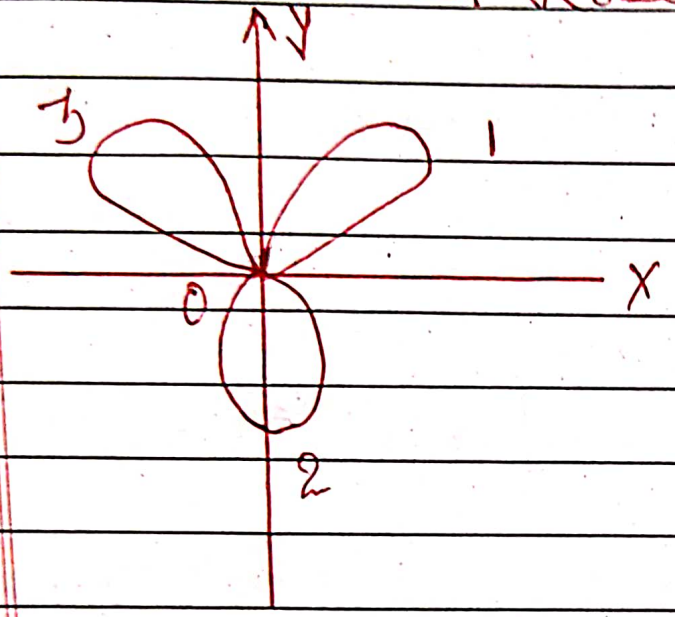
1.) $r = a\sin 3\theta$ Here $n=3$ and hence will have 3 loops.

θ	0	$\pi/6$	$\pi/3$	$\pi/2$	$2\pi/3$
3θ	0	$\pi/2$	π	$3\pi/2$	2π
r	0	a	0	$-a$	0

r is never greater than $|a|$. There is no asymptote as curve is closed. It has three loops as shown below. The curve consists of a series of similar loops

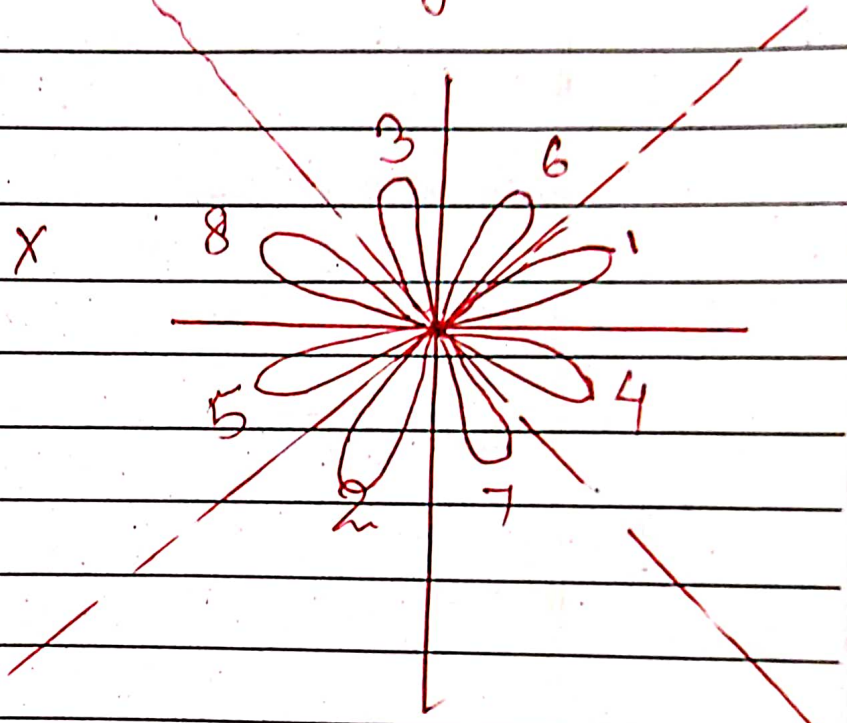
as shown in figure below for $n=3$ and $n=4$, all being arranged symmetrically about the origin.

Three leaved Rose



$r = a \sin 3\theta$

Eight leaved Rose



$r = a \sin 4\theta$

(b) Class of Curves $r^n = a^n \cos n\theta$