



COMSATS Institute of Information Technology (CIIT)

Islamabad Campus

Department of Computer Science

1st Sessional Exam Fall 2015

Program : BSE-II(B)

Semester : II

Subject : Multivariable Calculus (MTH105)

Total Marks : 20

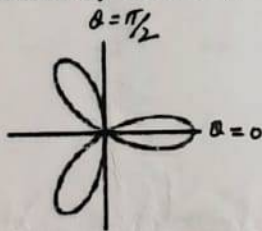
Time Allowed: 1hrs

Date 15-10-2015

Instructor: Dr. M. Yousaf

Attempt all questions

- Q.1 Find the equation of tangent line to the curve $x = 2t + 4$, $y = t^2 - 2t + 4$ at $t = 1$.
- Q.2 Sketch the cardioid $r = a(1 - \cos\theta)$ in polar coordinates and calculate arc length from $\theta = 0$ to $\theta = \pi$.
- Q.3 Find the area of the region enclosed by the rose $r = \cos 3\theta$ given in the figure below.



- Q.4 Find an equation of sphere with center $(2, -1, -3)$ and tangent to the xy -plane.
- Q.5 Show that the direction cosines of a vector satisfy $\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma = 1$.