Pledge:

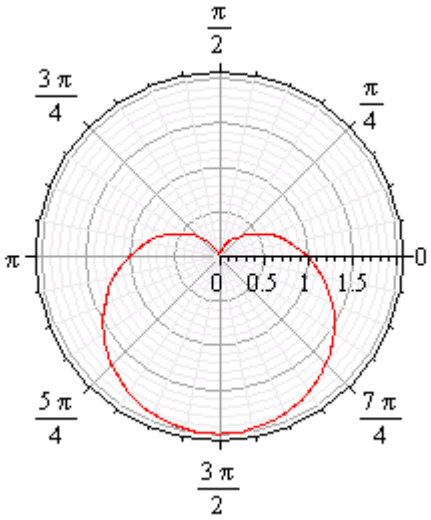
3/24/2010 MATH361 Calculus III Name:_____
Dr. Lunsford Quiz 5 (40 Points Total)

Please show all work on this quiz.

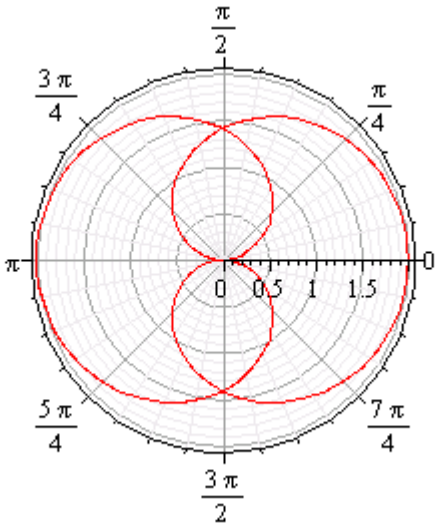
$$\int \sin^2 u\, du = \frac{1}{2}u - \frac{1}{4}\sin(2u) + C$$

$$\int \cos^2 u\, du = \frac{1}{2}u + \frac{1}{4}\sin(2u) + C$$

Problem I. Below you are given the polar graph of $r(\theta) = 1 - \sin(\theta)$. Find the slope of the tangent line to r at $\theta = \pi$. Draw the tangent line on the graph. (12 points)

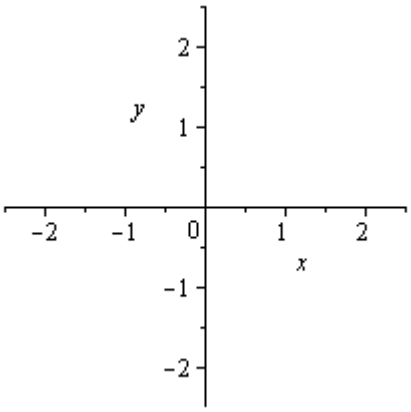


Problem II. Below you are given the polar graph of $r(\theta) = 2\cos(\theta/2)$. Indicate the portion of the graph that is drawn when $\pi \le \theta \le \frac{3\pi}{2}$. (5 points)



Problem III. Convert the integral $\int_0^1 \int_y^{\sqrt{2-y^2}} (x+y)\, dx\, dy$ to polar coordinates. DO NOT INTEGRATE.

Use the axes provided to your right to graph the region over which you are integrating. (10 points)



Problem IV. Below you are given the polar graph of $r(\theta) = 4\sin(3\theta)$. Find the area enclosed by the graph. Hint: The graph is completely drawn for some $\theta < 2\pi$. Neatly show all work. (13 points)