

Quiz 8

Math 104 - Calculus I

April 7, 2008

Name: _____ SOLUTIONS _____

Note: *In order to receive full credit, you must show work that justifies your answer.*

1. Find a polar equation for the curve represented by $x^2 + y^2 = 9$.

Since $x^2 + y^2 = r^2$, the given equation becomes $r^2 = 9$, so $r = \pm 3$. In fact, both $r = 3$ and $r = -3$ are equations for a circle about the origin of radius 3, so either is an acceptable answer.

2. Find the area of the region bounded by $r = \cos \theta$, for $0 \leq \theta \leq \frac{\pi}{2}$.

$$\begin{aligned} A &= \int_0^{\pi/2} \frac{1}{2} \cos^2 \theta \, d\theta = \int_0^{\pi/2} \frac{1 + \cos 2\theta}{4} \, d\theta \\ &= \left[\frac{1}{4}\theta + \frac{1}{8} \sin 2\theta \right]_0^{\pi/2} = \frac{\pi}{8} \end{aligned}$$

Note that this is the area of half a circle of radius $\frac{1}{2}$.