1	/15
2	/10
Total	/25

MATH 251   Quiz 1   Spring 2010

Sections 200,511   P. Yasskin

1. (15 points)   Compute the area of the cone $z = \sqrt{x^2 + y^2}$ below $z = 3$.

NOTE: The cone may be parametrized by
$$\vec{R}(r,\theta) = (r\cos\theta, r\sin\theta. r)$$

Complete each of the following steps:

$\vec{e}_r =$

$\vec{e}_\theta =$

$\vec{N} = \vec{e}_r \times \vec{e}_\theta =$

$\left|\vec{N}\right| =$

$A = \iint\limits_{C} dS = \iint\limits_{C} \left|\vec{N}\right| \, dr \, d\theta =$

2. (10 points) Compute $\iint y\,dx\,dy$ over the diamond shaped region bounded by the curves

$$y = 4x \qquad y = \frac{x}{4} \qquad y = \frac{1}{x} \qquad y = \frac{4}{x}$$

HINT: Let $u^2 = xy$ and $v^2 = \frac{y}{x}$. Solve for x and y.