NAME:

Math 2401 (K1-K3)

Quiz 7 - Take-home

Instructions: You will have to turn in the completed quiz in recitation, Monday 3/23/2015. You are allowed to collaborate with one another, but the solutions you turn in must be your own - that is, you cannot copy another student's solution, but must instead write your own.

1. [20 points] Find the volume of the region in space bounded above by the surface:

$$z = xye^{xy^2},$$

and bounded below by the rectangle: $0 \leq x \leq \ln(7)$; $0 \leq y \leq 1$.

2. [20 points] Find:

$$\int_1^2 \int_1^{\sqrt{z}} \int_{\ln(2y)}^{\ln(4y)} e^{x+y^2+z}\, dx\, dy\, dz.$$

3. [20 points] Consider the integral:

$$\int_0^{\sqrt{2}} \int_{y^2}^2 y^3 e^{x^3}\, dx\, dy.$$

a). Sketch the region of integration.
b). Compute the integral (you may want to switch the order of integration if you cannot compute it as given).

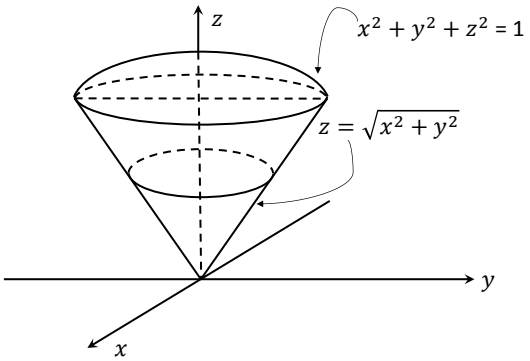
4. [18 points] Sketch the region of integration and compute the integral:

$$\iint_R \sin(x^2+y^2)\, dA,$$

where R is the region in the x, y-plane given by:

$$\begin{cases} 1 \leq x^2+y^2 \leq 4 \\ y \geq 0. \end{cases}$$

5. [16 points] Using *cylindrical coordinates*, set up the triple integral to compute the volume of the solid enclosed by the sphere $x^2+y^2+z^2=1$ and the cone $z=\sqrt{x^2+y^2}$ (pictured below). You do not have to compute the value of the integral.



6. [6 points] Sketch the region of integration and compute the integral:

$$\int_{-1}^0 \int_{-\sqrt{1-x^2}}^0 \frac{5}{1+\sqrt{x^2+y^2}}\, dy\, dx.$$