

Quiz 8 - Math 53
October 30, 2008

Name _____

1)[4pts] Evaluate the integral $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{x^2+y^2} 1 \, dz \, dy \, dx$. (Hint: convert to cylindrical coordinates and write the integral in the order $dz \, dr \, d\theta$)

2)[5pts] Let E be the part of the unit ball where x , y and z are positive, i.e. E is one eighth of the ball. Assuming E has density 1, find the center of mass of E .
(Hint 1: by symmetry, you know that $\bar{x} = \bar{y} = \bar{z}$, so it is enough to find \bar{z} .)
(Hint 2: use spherical coordinates.)
(Hint 3: the mass is equal to the volume of E , which you can compute without doing any integrals.)