Math 324 Quiz 1 Practice

January 20, 2017

Problem 1. Find the mass and the center of mass of the cube $0 \le x \le a$, $0 \le y \le a$, $0 \le z \le a$, with density given by $\rho = b(x^2 + y^2 + z^2)$.

Problem 2. Find the volume of the tetrahedron enclosed by the coordinate planes and the tetrahedron $4x + y + z = 4$.

Problem 3. Use cylindrical coordinates to evaluate the integral

$$\int \int \int_R e^z dV$$

where R is the region enclosed by the paraboloid $z = 6 + x^2 + y^2$, the cylinder $x^2 + y^2 = 3$, and the xy-plane.