Name: Score: /8

Math 1321 Week 12 Lab Due Thursday 12/4

1. **(2 points)** Let W be the solid bounded by the planes $x = 0$, $y = 0$, and $z = 2$, and the surface $z = x^2 + y^2$. Compute $\iiint_W x dx dy dz$.

2. **(1 points)** Determine the area of the region bounded by two hyperbolas $xy = 1$, $xy = 2$ and two lines $y = 2x$ and $y = \frac{1}{2}x$ in the first quadrant.

3. **(1 point)** Determine the volume of the solid bounded by the cone $z = 2 - \sqrt{x^2 + y^2}$ and the paraboloid $z = x^2 + y^2$.

4. **(2 point)** Determine the volume of the solid bounded by the circular cylinder $(x-a)^2 + y^2 = a^2$, the cone $z = x^2 + y^2$ and the plane $z = 0$.

5. **(2 point)** Let Ω be the region bounded by the sphere $x^2 + y^2 + z^2 = 1$ and the plane $z = 0$. Compute $\iiint_\Omega \frac{1}{x^2 + y^2 + z^2 + 1}\, dx\, dy\, dz$.

6. **(2 point)** Determine the center of mass for the solid bounded by the paraboloid $z = 4 - x^2 - y^2$ and $z = 0$ with density function $\rho(x, y, z) \equiv 1$.