

Math 13 Fall 2009: Exam 3
Wednesday December 2, 2009

Name:

Instructions: There are 4 questions on this exam each of which is scored out of 8 points for a total of 32 points. You may not use any outside materials(eg. notes or calculators). You have 50 minutes to complete this exam. Remember to fully justify your answers.

Score:

Problem 1. Evaluate

$$\int_{-2}^2 \int_{x^2}^4 \int_{-\sqrt{z-x^2}}^{\sqrt{z-x^2}} dy dz dx$$

Problem 2. Given the region inside $r = 1 + 2 \cos \theta$ and outside $r = 2$ with density $\delta = r$.

1. Write but do not evaluate integrals for mass and center of mass.
2. Write but do not evaluate integrals for the moments of inertia I_x and I_y .

Problem 3. Find the volume of the solid bounded by $z = x^2$, $y + z = 4$, and $y = 0$.

Problem 4. Find the mass inside the ellipsoid $\frac{x^2}{25} + y^2 + \frac{z^2}{9} = 4$ in the first octant if $\delta = \frac{x^2}{25} + y^2 + \frac{z^2}{9}$.