Quiz 6 25 points Math 200 Name: _____

1. (5 points) Use polar coordinates to evaluate $I = \int_{-3}^{3} \int_{0}^{\sqrt{9-x^2}} \sin(x^2 + y^2)\, dy\, dx$.

2. (4 points) Find the center of mass for the the quarter disk $x^2 + y^2 \leq 4$, $x \geq 0$ and $y \geq 0$, if the density is $\delta(x, y) = y$ grams per square meter.

3. (4 points) Find the moment of inertia about the origin for the triangular region R with vertices at $(2, 4)$, $(2, 0)$ and $(4, 0)$ if the density is $\delta(x, y) = \dfrac{3x}{x^2 + y^2}$ grams per square meter.

4. (6 points) Use spherical coordinates to evaluate $I = \iiint_E x^2 + y^2 \, dV$ if E is the solid hemisphere $\rho \leq 1$ with $z \geq 0$.

5. (6 points) Use Green's Theorem and a double integral to evaluate the work done by the force $\vec{F} = \langle x(x+y), xy^2 \rangle$ in moving a particle once around a triangle starting at $(0,0)$ moving to $(1,0)$ and then to $(0,1)$ before returning to $(0,0)$.