Quiz 6 25 points Math 200 Name: _____

1. (5 points) Use polar coordinates to evaluate $I = \int_0^1 \int_y^{\sqrt{2-y^2}} x + y \, dx \, dy$.

2. (4 points) Find the center of mass for the quarter-disk $x^2 + y^2 \leq 1$, $x \geq 0$ 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 quarter-disk $x^2 + y^2 \leq 1$, $x \geq 0$ and $y \geq 0$ if the density is $\delta(x, y) = y$ grams per square meter.

4. (6 points) Use spherical coordinates to evaluate $I = \iiint_E \frac{1}{x^2+y^2+z^2}\,dV$ if E is the solid that lies between the spheres $\rho = 1$ and $\rho = 5$.

5. (6 points) Use Green's Theorem **once** to evaluate $\int_C \vec{F} \cdot d\vec{s}$ if $\vec{F}(x,y) =< -y, x >$ and if C is the curve that starts at $(1,0)$ and rotates once around the ellipse $x^2 + \frac{y^2}{4} = 1$ in the counterclockwise direction.