Math 200 Quiz #7 25 points Name:____

1) Use substitution to calculate I = $\iint_R \frac{(x-y)^2}{\sqrt{x+y}}\,dxdy$ if R is the region in the xy - plane bounded by $x+y=1$, $x+y=2$, $x-y=1$, and $x-y=-1$. (7 points)

2) Find the mass of the surface S parameterized by $\vec{\alpha}(u,p)=\langle \cos u, \sin u, \sin p\rangle$ for $0\le u\le \frac{\pi}{2}$, and $0\le p\le \frac{\pi}{2}$ if the density is $\delta(x,y,z)=x^2+y^2+z^2$ grams per square meter. (6 points)

3) Find the flux of $\vec{F}(x,y,z)=\langle 2x+y, x-2y, 2\rangle$ through the graph of $f(x,y)=2x^2-2xy-2y^2$, oriented up, if $1\le x^2+y^2\le 4$. (6 points)

4) Find the flux of $\vec{F}(x,y,z)=\langle x,z,\text{y}\rangle$ through the piece of the cylinder $x^2+y^2=4$ that lies in the first octant below z = 5. This surface is oriented away from the z – axis. (6 points)