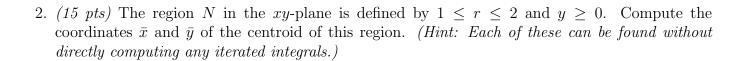
EXAM 2

Math 212, 2020 Fall.

Name:	NetID:	Student ID:								
GENERAL RULES										
YOU MUST SHOW ALL WORK AND EXPLAIN ALL REASONING TO RECEIVE CREDIT. CLARITY WILL BE CONSIDERED IN GRADING.										
No calculators.										
All answers must be reasonably simplified.										
All of the policies and guidelines on the class webpages are in effect on this exam.										
It is strongly advised that you use black pen only, so that your work will scan as clearly as possible.										
DUKE COMMUNITY STANDARD STATEMENT										
"I have adhered to the Duke Comm	nunity Standard in cor	mpleting this examination."								
Signature: _										

 $(Scratch\ space.\ Nothing\ on\ this\ page\ will\ be\ graded!)$

1. (15 pts) The domain D in the xy-plane is bounded by the lines x=0, y=1, and y=x. Mass is distributed through D with density given by $\delta(x,y)=e^{(1-x)^2}+e^{y^2}$. Compute the total mass in D. (Hint: Think about the order of the differentials.)



- 3. (20 pts) The solid M is bounded by the surfaces $x^2 + y^2 = 1$, $z = x^2 + y^2$, and $z + e^{3x+y^2} = 0$.
 - (a) Write (but do not evaluate yet) an iterated integral representing the integral over M of the function $f(x,y,z)=y^2\sin\left(xyze^{z^2}\right)$.

(b) Evaluate the integral from part (a) using any methods from this course.

4. (15 pts) The region R in the xy-plane is bounded by the curves parametrized by (t, e^t) , $(t+2, e^t)$, (t, 1-t), and (t, 3-t). Compute the double integral over R of $g(x, y) = 1 + \frac{1}{y}$.

- 5. (20 pts) The region K is the portion of the unit ball (centered at $\vec{0}$) above the xy-plane and below the plane y=z.
 - (a) Write (but do not evaluate) an iterated integral in cylindrical coordinates that represents $\iiint_K xyz\,dV$.

(b)	Write (but $\iiint_K xyz dV$	do 7.	not	evaluate)	an	iterated	integral	in	spherical	coordinates	that	represents

