## MA227-6D, CALCULUS III

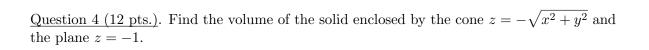
December 03, 2012

Name (Print last name first):	
Student Signature:	
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	TEST III

Question 1 (12 pts.). Find the volume of the solid under the surface z = y + 1 and above the region bounded by  $y = \ln x$ , y = 0, x = 0 and y = 1.

Show all of your work for full credit.

Question 2 (12 pts.). first quadrant.	Evaluate	$\iint_D 2xydA,$	where $D$ is	bounded by q	$y = x^3$ and $y =$	x in the
				A newor:		
Question 3 (12 pts.).	Evaluate	$\int_{0}^{2} \int_{y/2}^{1} e^{x^{2}} dx$				
				Answer:		



Answer: .....

Question 5 (12 pts.). Find the area of the region bounded by the ellipse  $\frac{x^2}{9} + \frac{y^2}{4} = 1$ . (Hint: use the transformation x = 3u, y = 2v).

Question 6 (12 pts.). Evaluate  $\iiint_E y^2 dV$ , where E is the tetrahedron bounded by x=0,  $y=0,\,z=0,$  and x+y+z=1.

Question 7 (12 pts.). Let E be the solid sphere  $x^2 + y^2 + z^2 \le 1$  with a constant density. Find its moment of inertia  $I_z$  about the z-axis.

Question 8 (16 pts.). A lamina occupies the region  $D = \{(x,y) \mid x^2 + y^2 \le 1, y \ge 0\}$  and has the density  $\rho(x,y) = y$ . Find its center of mass.