

MATH 261 EXAM 3, Fall 2004

Simplify all answers. Show your work!		Name:	Score	
1.	a) Find $\int \int_R (3x^2 - xy) \, dydx$; $R = [0, 1] \times [0, 1]$. Ans:_____.	b) Find $\int_0^1 \int_0^x 2e^{3x} \, dydx$ Ans:_____.	1	
			2	
			3	
			4	
			5	
			6	
2.	Let $I = \int \int_R 2x^2y^3 \, dydx$, over the region R bounded by $y = 1$ and $y = \sqrt{4 - x^2}$. a) Sketch the region of integration	b) Set up the integral. (Do not evaluate)	7	
			8	
			9	
			10	
			Tot	
Ans:_____.		Ans:_____.		
3.	Let $I = \int_0^1 \int_{\sqrt{y}}^1 \frac{1}{\sqrt{4+x^3}} \, dx dy$. a) Reverse the order of integration.	b) Compute the integral.	Ans:_____.	
			Ans:_____.	
4.	Let $I = \iint_D e^{-x^2-y^2} \, dydx$, where D is the region bounded by $x = \sqrt{1 - y^2}$, $x = \sqrt{4 - y^2}$, $x = 0$, and $y = 0$. a) Convert to polar coordinates.	b) Evaluate the integral.	Ans:_____.	
			Ans:_____.	
5.	Write the equation of the cone $4z^2 = x^2 + y^2$, $z \geq 0$: a) In Cylindrical Coordinates.	b) In spherical coordinates.	Ans:_____.	
			Ans:_____.	
Extra Space				

Part II.	Name:	
6.	<p>Let V be the volume in the first octant bounded by the cylinder $y^2 + z^2 = 4$ and the plane $z = x$.</p> <p>a) Set up the volume integral.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) Compute the integral.</p> <p style="text-align: right;">Ans:_____.</p>
7.	<p>A lamina with $\sigma = 5y$ is bounded by $y = x^2$ and $x = y^2$. Set up the integrals for:</p> <p>a) The c.m. coordinate \bar{y}.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) The moment of inertia I_z.</p> <p style="text-align: right;">Ans:_____.</p>
8.	<p>A solid is bounded by the coordinate planes and the plane $3x + 5y + z = 15$. Set up the volume integral</p> <p>a) As a double integral.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) As a triple integral.</p> <p style="text-align: right;">Ans:_____.</p>
9.	<p>A solid is bounded above by $\rho = \cos \phi$ and below by the cone $\phi = \pi/6$.</p> <p>a) Set up the volume integral.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) Compute the volume.</p> <p style="text-align: right;">Ans:_____.</p>
10.	<p>Compute the Jacobian of the following transformations:</p> <p>a) $x = 5r - 3s, y = r + 6s$.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) $x = 5r - 3s, y = r + 6s, z = 4t$.</p> <p style="text-align: right;">Ans:_____.</p>
Extra space		