

MATH 261 EXAM 3, Spring 2005

Simplify all answers. Show your work!		Name:	Score		
1.	a) Find $\int \int_R x e^{xy} dy dx$; $R = [0, 2] \times [0, 2]$.	b) Find $\int_0^2 \int_0^1 x/(y^2 + 1) dy dx$	1		
			2		
			3		
			4		
			5		
			6		
Ans:_____.		Ans:_____.			
2.	Find the volume in the first octant bounded by $z = 9 - y^2$ and $x = 4$.	a) Set up the integral.	b) Evaluate the integral.	7	
				8	
				9	
				10	
				Tot	
Ans:_____.		Ans:_____.			
3.	Let $I = \int_0^1 \int_{x^2}^1 x^3 \sin(y^3) dy dx$.	a) Reverse the order of integration.	b) Compute the integral.		
				Ans:_____.	
4.	Let $I = \iint_D xy dy dx$, where D is the region bounded by $x = \sqrt{4 - y^2}$ and $x = 0$.	a) Convert to polar coordinates.	b) Evaluate the integral.		
				Ans:_____.	
5.	Convert the equation of the surface $z = \sqrt{3}r$ to:	a) Cartesian Coordinates.	b) Spherical coordinates.		
				Ans:_____.	
Extra Space					

Part II.	Name:
<p>6. Let V be the volume bounded by the paraboloids $y = 3x^2 + 3z^2$ and $y = 4 - x^2 - z^2$.</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>
<p>7. A lamina with $\sigma = x^2 + 3y$ is bounded by $y = x - 2$ and $x = y^2$. Set up the integrals for:</p> <p>a) The c.m. coordinate \bar{x}.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) The moment of inertia I_x.</p> <p style="text-align: right;">Ans:_____.</p>
<p>8. A tetrahedron has vertices at $(0,0,0)$, $(1,1,0)$, $(0,1,0)$ and $(0,1,2)$. 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>
<p>9. Use spherical coordinates to evaluate $\int \int \int_E z \, dV$ where E is the region bounded by $z = \sqrt{1 - x^2 - y^2}$, $z = \sqrt{9 - x^2 - y^2}$, and $z = 0$.</p> <p>a) Set up the integral.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) Compute the integral.</p> <p style="text-align: right;">Ans:_____.</p>
<p>10. Compute the Jacobian of the following transformations:</p> <p>a) $x = uv$, $y = 4u + 3v$.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) $x = uv$, $y = 4u + 3v$, $z = 5w$.</p> <p style="text-align: right;">Ans:_____.</p>
<p>Extra space</p>	