

MATH 261 EXAM 3, Spring 2004

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

Part II.	Name:
<p>6. Let <math>V</math> be the volume inside both the cylinder <math>x^2 + y^2 = 4</math> and the ellipsoid <math>4x^2 + 4y^2 + z^2 = 64</math>.</p> <p>a) Set up the volume integral in polar coordinates.</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 <math>\sigma = 3y</math> is bounded by <math>y = 25 - x^2</math> and <math>y = 0</math>. Set up the integrals for:</p> <p>a) The c.m. coordinate <math>\bar{y}</math>.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) The moment of inertia <math>I_x</math>.</p> <p style="text-align: right;">Ans:_____.</p>
<p>8. A solid is bounded by the coordinate planes and the plane <math>3x + 2y + z = 24</math>. 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. A solid is bounded above by <math>z = \sqrt{25 - x^2 - y^2}</math> and below by the cone <math>z = \sqrt{3x^2 + 3y^2}</math>.</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>
<p>10. Compute the Jacobian of the following transformations:</p> <p>a) <math>x = 3u, y = 4u - 5v</math>.</p> <p style="text-align: right;">Ans:_____.</p>	<p>b) <math>x = u \cos v, y = u \sin v</math>.</p> <p style="text-align: right;">Ans:_____.</p>
<p>Extra space</p>	