Lecture 13: Integrals and coordinate systems

Math 195 Section 91

Monday July 20, 2009

1 spherical coordinates (16.8)

$x = \rho \sin\varphi \cos\theta$, $y = \rho \sin\varphi \sin\theta$, $z = \rho \cos\varphi$.
$dV = \rho^2 \sin\varphi d\rho d\varphi d\theta$.

2 chain of variables (16.9)

examples: cylindrical, spherical, polar coordinates
"transformations" and images, injective (1 to 1), bijective, etc.
assume the "transformations" to be C^1.
inverse transformations
Jacobian matrix
triple integrals (three-by-three determinants)