

Typical Topics for Math 18

Differentiation in Several Dimensions

- visualizing/sketching functions of several variables
- partial derivatives, directional derivatives, gradient
- chain rule
- first and second derivative tests in several variables
- Lagrange multipliers

Integration in Several Dimensions

- definition of the integral in several dimensions
- iterated integrals
- polar, cylindrical, and spherical coordinates
- volume and surface area
- center of mass; moments of inertia
- change of variables formula

Vector Calculus

- vector fields
- divergence and curl
- conservative vector fields, potentials
- line and surface integrals
- Green's Theorem
- The Divergence Theorem
- Stokes' Theorem