Outline for Exam 2

The exam will cover material from sections 13.1-13.8. The topics by section are

13.1, 13.2 Double integrals. Double integrals as iterated integrals. Changing the order of integration.

13.3 Using the double integral to compute area and the average value of a function over a region R in the plane.

13.4 Double integrals in polar coordinates. Setting up the integral of $f(r, \theta)$ in polar coordinates. The polar area differential $dA = r\,dr\,d\theta$. Switching from rectangular to polar coordinates in double integrals.

13.5 Triple integrals in rectangular coordinates. Triple iterated integrals. Changing the order of integration.

13.6 Using double and triple integrals to compute masses and first and second moments. Volumes by triple integration.

13.7 Triple integrals with cylindrical coordinates (r, θ, z) and spherical coordinates (ρ, φ, θ). The volume differentials $dV = r\,dr\,d\theta\,dz$ and $dV = \rho^2 \sin\varphi\,d\rho\,d\varphi\,d\theta$.

13.8 The general change-of-variable formula in two and three dimensions. The Jacobian determinant.