MA677
MWF 10-10:50pm
CB 345
Fall 2007

Instructor: Russell Brown
Office: POT741
Phone: 859 257 3951
russell.brown@uky.edu

The following problems will be due on 31 August.

1. Write an iterated integral to compute the area of the triangle $\{(x_1, x_2) : x_1 \geq 0, x_2 \geq 0, x_1 + x_2 \leq 1\}$.

2. Let S_n be the measure of the simplex $\{(x_1, x_2, \ldots, x_n) : x_j \geq 0, j = 1, \ldots, n \text{ and } \sum_{i=1}^n x_i \leq 1\}$. Find S_2. Give a relation between S_n and S_{n-1} and find S_n.

3. (Wheeden and Zygmund, page 97) Let Ω_n be the volume of the unit ball in $\mathbf{R}^n$. Show that
$$\Omega_n = 2\Omega_{n-1} \int_0^1 (1 - t^2)^{(n-1)/2} \, dt.$$

August 23, 2007