

**Homework Assignment 9, MATH 515, Spring 09**

**Problem 23) (12 pts)** Let  $A_1, A_2, \dots, A_n$  be measurable subsets of a measured space  $(X, \mathcal{M}, \mu)$ . For  $1 \leq p \leq n$  we write

$$s_p := \sum_{i_1 < i_2 < \dots < i_p} \mu(A_{i_1} \cap A_{i_2} \cap \dots \cap A_{i_p}).$$

Show *Poincare's formula*:

$$\mu(A_1 \cup A_2 \cup \dots \cup A_n) = \sum_{p=1}^n (-1)^{p-1} s_p.$$

**Problem 24) (12 pts)** page 174, Chapter VI, §10, Exercise 8

**Problem 25) (12 pts)** page 174, Chapter VI, §10, Exercise 9