# Homework 4

## *Ma635 Real Analysis I*

due Thursday Nov 15, 2006

1) Explain with details using your own words the proof of the Theorem 3.14 in the textbook and of the two lemmas that are needed. You should present the schematics of the proofs and you should start by rewriting with your own words what is given (hypothesis) and what you need to prove (conclusion) for each of these results.

2) Let $A, B \subseteq \mathbb{R}^n$, $A \cap B = \emptyset$. Let the family $\mathscr{C} = \{A, B\}$. Find the $\sigma$-algebra $\sigma(\mathscr{C})$ generated by the family of sets $\mathscr{C}$.

3) Repeat the previous exercise but now consider the case $A \cap B \neq \emptyset$.

4) Do exercises 17, 26 and 27 on pages 48–49.