Math 8601, Fall 2001 Assignments

Assignments are due at the start of class on the due date. Further Problems may be scored competitively! Give credit for help received, including books and hints from me and others; mention discussions. If a Further Problem is difficult, please include a "narrative" that tells what you went thru to reach your results.

Assignment 12
Book Problems: Due Dec 10

Chapter 6, # 3, 4, 5.

Assignment 11
Book Problems: Due Dec 3

Chapter 4, # 19; Chapter 5, # 1, 4, 6. Note that # 19 has been moved from Assignment 10 to Assignment 11! If you already solved it, turn it in again next Monday (the grader won't score it).

Assignment 10
Book Problems: Due Nov 26

Chapter 4, # 18, 19, 20; Chapter 5, # 3, 15. Note reduction in Assignment 9!

Assignment 9
Book Problems: Due Nov 19

Chapter 4, # 11, 12, 15. New version!

Further Problem 4: Due Nov 14

Prove that if f is measurable on $\mathbb{R}^n$ and g is measurable on $\mathbb{R}^m$ then $f(x)g(y)$ is measurable on $\mathbb{R}^{n+m}$.

Assignment 8
Book Problems: Due Nov 12

Chapter 3, # 22; Chapter 4, # 2, 3, 4, 7.

Further Problem 3: Due Nov 7

Prove that, if $E_1 \subseteq \mathbb{R}^m$ and $E_2 \subseteq \mathbb{R}^m$ are measurable sets then $E_1 \times E_2$ is a measurable subset of $\mathbb{R}^{m+n}$ and that $|E_1 \times E_2| = |E_1| \times |E_2|$, provided that we set $0 \times \infty = 0$. Show that $\mathcal{L}_m \times \mathcal{L}_n$ and $\mathcal{B}_m \times \mathcal{B}_n$ are not σ-algebras. Identify the smallest σ-algebras that contain each of $\mathcal{L}_m \times \mathcal{L}_n$ and $\mathcal{B}_m \times \mathcal{B}_n$.

Assignment 7
Book Problems: Due Nov 5

Chapter 3, # 23, 24, 27.

Assignment 6
Book Problems: Due Oct 29

Chapter 3, # 14, 15, 17, 19, 20.

Further Problem 2: Due Oct 26

Prove that the σ-algebra $\mathcal{B}$ of Borel sets is generated by the family of intervals with "rational" vertices, namely, all the coordinates of each vertex are rational numbers. Be sure you include any "general nonsense" that you need.

Assignment 5
Book Problems: Due Oct 22

Chapter 2, # 18; Chapter 3, # 2, 5, 13.

Assignment 4
Book Problems: Due Oct 15

Chapter 2, # 7, 8, 17; Chapter 3, # 9, 18(the first sentence).

Assignment 3

Book Problems: Due Oct 8

Chapter 2, # 9a, 9b, 11, 14, 15.

Assignment 2
Book Problems: Due Oct 1

Chapter 1, # 17; Chapter 2, # 4, 5.

Assignment 1
Book Problems: Due Sept 24

Chapter 1, # 1 (parts a, b, e, f); 3.

Further Problem 1: Due Sept 12

Prove that the only subsets of $\mathbb{R}^n$ that are both open and closed are $\mathbb{R}^n$ and $\emptyset$.