Math 828, Homework 1

Due September 13

1. Let $E_1, E_2 \subset \mathbb{R}^n$ be elementary. Show that $E_1 \setminus E_2$ is elementary.

2. Exercise 1.1.2.

3. Exercise 1.1.3.

4. Let $f\colon [0,1] \to \mathbb{R}$ be a Riemann integrable function. Show that the graph of f has Jordan measure zero in $\mathbb{R}^2$. Does the converse hold?

5. Exercise 1.1.13.

6. Exercise 1.1.14.

7. Show that any open set in $\mathbb{R}^n$ is a countable union of non-overlapping dyadic cubes (see previous exercise for definition of a dyadic cube).

8. Exercise 1.1.25.

9. Exercise 1.2.1.

10. Exercise 1.2.2.