PROBLEM SET 2b

1. Suppose $\{f_n\}$ is a sequence of continuous functions and let E be the set of x's where the seqeunce converges. Show that E is Borel, and hence Lebesgue measurable.

2. Is the set of rational numbers equal to the intersection of some countable collection of open sets?

3. Is a subset of a Borel set Borel?

4. What is the conditional probability that a $x \in [0,1]$ has first decimal digit even, given that its second binary digit is 1?

5. Let $X_n \subset [0,1]$ be the set of x's, whose nth binary digit is 1. Show these events are independent.