Real Analysis 1, MATH 5210, Spring 2017

Homework 13, The Construction of Outer Measures (17.4)

Due Tuesday, May 2

Write in complete sentences!!! *Explain* what you are doing and convince me that you understand what you are doing and why. Justify all steps by quoting relevant results from the textbook, class notes, or hypotheses. Do not copy the work of others; **do your own work!!!**

17.18. Let $\mu^* : 2^X \to [0, \infty]$ be an outer measure. Let $A \subset X$, $\{E_k\}_{k=1}^{\infty}$ a disjoint countable collection of measurable sets and $E = \cup_{k=1}^{\infty} E_k$. Then $\mu^*(A \cap E) = \sum_{k=1}^{\infty} \mu^*(A \cap E_k)$. NOTE: This is an extension of Proposition 17.6 from finite collections of E_k to countably infinite collections of E_k.

17.19. Prove that any Caratheodory measure that is induced by an outer measure is complete.