MTG 5316/4302 ASSIGNMENT 5

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These problems are due on October 10, 2014. You may discuss the problems with members of the class and with me. You may consult our textbook and other books. You may not read the papers of other students. The final writeup must be done by yourself in your own words. It must not be copied from any sources.

Problem 1. Show that $\mathbb{R}$ is a complete metric space with its usual metric.

Problem 2. Let $A \subset X$ be closed in X with X a complete metric space. Show that A is a complete metric space with the metric that it inherits from X.

Problem 3. Suppose that X is a nonempty complete metric space with no isolated points. Show that X has a subset of cardinality $2^{\aleph_0}$.