MTG 5316/4302 ASSIGNMENT 6

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These problems are due on October 20, 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. Suppose that X is a compact Hausdorff ($\mathbf{T}_2$) space. Show that if $A \subset X$ is compact, then it is closed.

Problem 2. Let X be a metric space. Show that X is compact if and only if for every sequence $\{x_i\}_{i=1}^{\infty} \subset X$, there is an $z \in X$ and a subsequence $\{x_{i_j}\}_{j=1}^{\infty}$ such that $x_{i_j} \to z$ as $j \to \infty$.

Problem 3. Suppose that X is a compact Hausdorff ($\mathbf{T}_2$) space. Show that X is normal ($\mathbf{T}_4$).