QUIZ 4 MTG 5317/4303 SPRING 2019

JAMES KEESLING

Problem 1. Suppose that $n > 1$. Show that $\mathbb{R}^n$ is not homeomorphic to $\mathbb{R}$.

Problem 2. Suppose that $n > 2$. Shos that $\mathbb{R}^n$ is not homeomorphic to $\mathbb{R}^2$.

Problem 3. Suppose that X is a regular Lindelöf space. Show that X is normal.

Problem 4. Let X be a locally compact Hausdorff space. Describe the topology of the one-point compactification, $X \cup \{\infty\}$, and show that this space is compact and Hausdorff.

Problem 5. Suppose that X is completely regular. Show that there is a compact Hausdorff space βX that contains X as a dense subset such that for every $f : X \to [0, 1]$ that is continuous, there is a continuous $\beta f : \beta X \to [0, 1]$ such that $\beta f_{|X} \equiv f : X \to [0, 1]$.