INTRODUCTION TO TOPOLOGY, MATH 141, HW#8

Problem 1.

Let X be a topological space with cofinite topology. Prove that X is compact.

Problem 2.

Describe explicitly all connected topological spaces with discrete topology.

Problem 3.

Prove that the closure of a connected set is connected.

Problem 4.

Show that a continuous image of a path connected set is path connected.

Problem 5.

Prove that an open subset of $\mathbb{R}^n$ is connected if and only if it is path connected.