Homework 11 Supplementary Problems

1. Prove that $|[0,1)| = |[0,1]|$.

2. A number $r \in \mathbb{R}$ is called *algebraic* if $\exists n \in \mathbb{N}, a_0, \ldots, a_n \in \mathbb{Z}$, such that

$$a_0 r^n + a_1 r^{n-1} + \cdots + a_0 = 0.$$

   Prove that the set of algebraic numbers is denumberable.

3. Given two sets E, F, we define $E \to F$ to be the set of all functions from E to F. Prove that

$$|(A \times B) \to C| = |A \to (B \to C)|.$$