Homework 2, due Monday September 10

1. Prove that if $f : A \to B$ is onto, then $\text{card}(B) \leq \text{card}(A)$.

2. Any real number which is the root of a polynomial with integer coefficients is called an algebraic number. Prove that the set of all algebraic numbers is countable.

3. page 38:9 (you only have to do the bounded sequence case)

4. page 147: 12, 13

5. Bonus question: Prove that $[0, 1]$ is equivalent to $(0, 1)$. You can not use Schröder–Bernstein in your solution, but should construct an explicit map.

Note: You can not cooperate on bonus questions, neither will I give hints.