1. Prove Laws 2e)-2k). Remember that you may not use another Law unless it comes before the one being proved. Justify each sentence in the proofs.

2. A real number $x$ is said to be \textit{algebraic} if it satisfies some polynomial equation of positive degree

$$x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0 = 0$$

with rational coefficients $a_i$. Assuming each such equation has only finitely many roots, prove that the set of algebraic numbers is countable.