1. Prove that if a set $A$ contains an infinite set $B$ then $A$ is infinite. (Hint: See Cor. 6.5)

2. Prove that if a set $A$ contains an uncountable set $B$ then $A$ is uncountable. (Hint: Consider the contrapositive)

3. The set of transcendental numbers is defined to be $\mathbb{R} \setminus A$ where $A$ denotes the set of algebraic numbers. Show that the set of transcendental numbers is uncountable.