1. Prove that if $N$ is a null set in $\mathbb{R}^n$, then there exists a Borel null set $N'$ such that $N \subset N'$. In fact, prove that $N'$ may be chosen as a $G_\delta$ set—a countable intersection of open sets.

2. Prove that a set $A \subset \mathbb{R}^n$ is measurable if and only if there exists a set $B$ that is an $F_\sigma$ set (a countable union of closed sets) and a set $C$ that is a $G_\delta$ set such that $B \subset A \subset C$ and $C - B$ is a null set.