Third Homework Assignment
in 18.101

(1) Munkres §14 #8.

(2) Munkres §15, #4.

(3) Munkres §16, #3.

(4) Let $U$ be an open subset in $\mathbb{R}^n$ and $A \subset U$ a compact subset. Prove

**Theorem.** There exists a $C^\infty$ function, $\rho : \mathbb{R}^n \to \mathbb{R}$ such that $\rho$ is equal to one on a neighborhood of $A$, and the support of $\rho$ is contained in $U$. Hint: Partitions of unity.

(5) Let $f : \mathbb{R}^n \to \mathbb{R}^{n+1}$ be a $C^1$ map. Prove that the image of $f$ is a set of measure zero.