

Third Homework Assignment in 18.101
(Due Friday October 22)

(1) Munkres §13 #1, part b and #2. (You'll need part b of exercise 1 to do exercise 2.)

(2) Munkres §14, #8.

(3) Munkres §16, #3.

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

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

(5) Let $f : \mathbb{R}^n \rightarrow \mathbb{R}^{n+1}$ be a C^1 map. Prove that the image of f is a set of measure zero.
Hint: Munkres, Lemma 18.1.