

Homework Assignment 1, MATH 515, Spring 09

Problem 1) (8 pts) Let S be a subset of a topological space X and let \bar{S} denote the closure of S .

- (a) Prove that \bar{S} is closed.
- (b) If S, T are subsets of X and $S \subset T$, show that $\bar{S} \subset \bar{T}$.
- (c) If S, T are subsets of X , show that $\overline{S \cup T} = \bar{S} \cup \bar{T}$.
- (d) Show that $\bar{\bar{S}} = \bar{S}$.
- (f) If $S \subset T \subset \bar{S}$, prove that $\bar{T} = \bar{S}$.

Problem 2) (8 pts) page 44, Chapter II, §5, Exercise 3

Problem 3) (8 pts) page 45, Chapter II, §5, Exercise 5