Math 445 – David Dumas – Fall 2015

Homework 11

Due Wednesday, November 25 at 1:00pm

Instructions:

- To receive full credit, a solution must be clear, concise, and correct.

(—) From the textbook: 43.4, 43.5, 45.2, 45.4a

A topological X space is called *hemicompact* if there is a countable collection $\{K_i\}_{i\in\mathbb{N}}$ of compact subsets of X such that for every compact set $K \subset X$ there exists n with $K \subset K_n$.

(P1) Show that if X is hemicompact and Y is a metric space, then the topology of compact convergence on $C(X,Y)$ is metrizable. (Hint: The basic idea is to sum the sup metrics on $C(K_n,Y)$ for all n, but without some modification the sum may not converge.)

(P2) Show that if X is hemicompact, then X has a countable cover by compact sets.

(P3) Show that a hemicompact and first countable space is locally compact.

(P4) Give an example of a space that has a countable cover by compact sets but is not hemicompact. (Hint: use the previous problem.)