Math 557 – Homework #4

September 11, 2000

Combinatorial applications of the Compactness Theorem.

1. Application to graph coloring — Exercise 1.7.2 in the lecture notes. Show that a graph is k-colorable if and only if each finite subgraph is k-colorable.

2. Application to Dilworth's Theorem — Exercise 1.7.6 in the lecture notes. Show that a partial ordering is covered by k chains if and only if each finite subordering is covered by k chains. Assuming Dilworth's Theorem for finite partial orderings, deduce Dilworth's Theorem for arbitrary partial orderings.