Written Assignment 3 (due 1/25/13 by end of class)

Section 13: # 5

Exercise 2: Let X be a set with infinitely many elements.

(a) Let $\mathcal{C}$ be the collection of subsets $U \subset X$ such that the complement of U is a single point or U is the empty set. Show that $\mathcal{C}$ is a subbasis in the sense of the definition from section 13.

(b) What topology does $\mathcal{C}$ generate? Prove your answer.

Exercise 3: Find a simple ordering on $\mathbb{R}$ for which the order topology is *not* the usual topology, and prove that the two topologies are different.