MATH 430
HOMEWORK 4: DUE FRIDAY FEB. 12

From Enderton: Section 1.5 (p52): 1, 4.
Section 1.7 (p65): 1, 4, 5.

1. Let $\preceq$ be a partial order defined on a *finite* set X. Show that there is a $\preceq$-minimal element $m \in X$; that is, an $m \in X$ so that for all $x \neq m$ in X, $x \not\preceq m$.

2. Suppose $\{S_n \mid n \in \mathbb{N}\}$ is a collection of *finite* subsets of $\mathbb{N}$, such that whenever $F \subseteq \mathbb{N}$ is finite, there is a set $K_F \subseteq \mathbb{N}$ so that $|K_F \cap S_n| = 1$ for all $n \in F$.

(a) Show there is a set K so that $|K \cap S_n| = 1$ for all $n \in \mathbb{N}$. (Use compactness.)
(b) Show that the conclusion in (a) can fail if we do not assume the sets S_n are finite.