Math 441 - Homework 5

1. (10 points) Suppose that $A \subseteq \mathbb{R}$ is a closed set, and (s_n) is a convergent sequence such that $s_n \in A$ for all $n \in \mathbb{N}$. Prove that $\lim s_n \in A$.

2. (10 points) Suppose that (s_n) is a convergent sequence such that $a \leq s_n \leq b$ for all $n \in \mathbb{N}$. Prove that $a \leq \lim s_n \leq b$.

3. (10 points) Suppose that $\lim s_n = s$ where s is a positive number. Prove that there exists $N \in \mathbb{R}$ such that $s_n > 0$ for all n > N.