1. Suppose $F \subseteq \mathbb{R}$ is a closed subset of the real numbers for which $\sup F$ exists. Show that $\sup F \in F$.

2. Suppose $E \subseteq X$ is a subset of a metric space. Let $E'$ be the set of all limit points of $E$. Show that $E'$ is closed. *(Hint. Show that if $x$ is a limit point of $E'$ then $x$ is a limit point of $E$)*