1. Suppose $B$ is a bounded subset of $\mathbb{R}$ and $A$ is a nonempty subset of $B$. Prove that $\inf(B) \leq \inf(A)$.

2. Identify
   a. $A^\circ$ (A interior)
   b. $\overline{A}$ (A closure)
   c. $(A^\circ)$
   d. $(\overline{A})^\circ$
   e. The set of all cluster points of $A$.

   where $A$ is (i) the Cantor set $F$, (ii) $\mathbb{Q} \cap [0,1]$}

3. Directly from the definition, show that $\{(x,y): |x| + |y| < 1\}$ is not compact.

4. Prove that if $A$ and $B$ are connected subsets of $\mathbb{R}$, then $A \times B$ is a connected subset of $\mathbb{R}^2$. 