Problem 1 (10 Points) Let $A$ and $B$ be subsets of metric space $X$. Show that $\bar{A} \subseteq \bar{B}$

Problem 2 (10 Points) Show an example of a set that is bounded but not totally bounded.

Problem 3 (10 Points) State and prove the Baire category theorem.

Problem 4 (10 Points) Prove that a compact metric space is separable.