Problem 15. Show that Theorem 2.36 and its Corolary become false (in $\mathbb{R}$, for example) if the word "compact" is replaced by "closed" or "bounded."

Proof. Bruh □

Problem 16. Regard $\mathbb{Q}$, the set of all rational numbers, as a metric space, with $d(p, q) = |p - q|$. let E be the set of all $p \in \mathbb{Q}$ such that $2 < p^2 < 3$. Show that E is closed and bounded in $\mathbb{Q}$, but that E is not compact. Is E open in $\mathbb{Q}$.