# 代数 2 H 班 作业 14

2023 年 8 月 2 日

We always denote by $R$ a commutative ring.

**题 1.** *Let $R[x]$ be a Jacobson ring. Prove that $R$ is a Jacobson ring. In the previous exercises, you proved that the Jacobson radical of $R[x]$ is equal to its nilradical. So taking $R$ a non-Jacobson ring, you obtain an example $R[x]$ whose Jacobson radical is equal to its nilradical but not Jacobson.*

**题 2.** *Let $R$ be a ring. Let $X_0 = \operatorname{Spec}_m R$ be the subset of $X = \operatorname{Spec} R$ consisting of all the closed points of $X$. Prove that $R$ is Jacobson if and only if for all closed subset $Z$ of $X$, we have $Z \cap X_0$ being dense in $Z$.*