



MODERN ALGEBRA II
FALL 2019

ASSIGNMENT 9.1
DUE NOVEMBER 13

Exercise 1. Let R be a domain and let $\pi \in R$. Prove that if π is irreducible in R , then it is irreducible in $R[X]$.

Exercise 2. Prove that every GCD domain is an AP domain. [*Suggestion:* You may assume the following nontrivial fact. If R is a GCD domain and $a, b, c \in R$, then $\gcd(a, b) = \gcd(a, c) = R^\times$ implies $\gcd(a, bc) = R^\times$.]

Exercise 3. Let R be a domain. Prove that if every *pair* of elements in R has a GCD, then R is a GCD domain.