

MATH 724
FALL 2005
HOMEWORK 5

Due Wednesday November 30, 2005.

1. (5 pt) Show that if R is a domain in which every nonzero proper ideal is a product of a finite number of prime ideals, then R is Dedekind.
2. (5pt) Show that if R is Dedekind, then every ideal can be generated with 2 elements.
3. (5 pt) Show that R is a Prüfer domain if and only if every two-generated ideal is invertible.
4. (5 pt) Show that if R is a Prüfer domain, $\mathfrak{P} \subseteq R$ is a prime ideal and $S \subseteq R$ is a multiplicatively closed set (not containing 0) then R_S and R/\mathfrak{P} are Prüfer domains.
5. (5 pt) Show that if R is a Prüfer domain, then R is a PID if and only if R is a UFD.