MATH 724
SUMMER 2010
HOMEWORK 2

Due Monday, July 17, 2010.

1. (5 pt) Show that the following are equivalent.
   (1) INC holds.
   (2) If $\mathfrak{P} \subseteq R$ is a prime ideal and $\mathfrak{Q} \subseteq T$ contracting to $\mathfrak{P}$ then $\mathfrak{Q}$ is maximal with respect to the exclusion of S, the complement of $\mathfrak{P}$ in R.

2. (5 pt) Give an example of an extension that is LO but not GU (or prove that GU and LO are equivalent).

3. (5 pt) Prove that R is Dedekind if and only if every nonzero proper ideal can be written as the product of prime ideals.