1. Suppose that R is a commutative ring, S is a multiplicatively closed subset of R, and P is a projective R-module. Show that $S^{-1}P$ is a projective $S^{-1}R$-module.

2. Conclude that, if R is noetherian, and R has finite global dimension, then so does $S^{-1}R$.

3. If M is finitely generated and R is noetherian, show that $S^{-1}\operatorname{Hom}_R(M,N) \simeq \operatorname{Hom}_{S^{-1}R}(S^{-1}M, S^{-1}N)$. Conclude that $S^{-1}\operatorname{Ext}^n_R(M,n) \simeq \operatorname{Ext}^n_{S^{-1}R}(S^{-1}M, S^{-1}N)$.

4. Conclude that if R is noetherian and I is an injective R-module then $S^{-1}I$ is an injective, both as an $S^{-1}R$-module and as an R-module.