Problem Set 1

Due: September 10, 2009

1. Auslander–Reiten–Smalø, Chapter 1, Exercise 1. (No need to write out proofs; just give a list.)

2. Auslander–Reiten–Smalø, Chapter 1, Exercise 5.

3. (Nakayama's Lemma) Auslander–Reiten–Smalø, Chapter 1, Exercise 7.

4. Prove that if $P \twoheadrightarrow A$ and $P' \twoheadrightarrow A$ are two projective covers of A, then $P \simeq P'$.

5. Describe all the indecomposable projective modules for the ring $\Lambda = \left[\begin{smallmatrix} * & \\ * & * \end{smallmatrix}\right]$.