

Math 561 Fall 2013 Homework Number 8

DUE MONDAY DECEMBER 9, 2013

1. Consider the quiver with two vertices and adjacency matrix $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$, called the \tilde{A}_1 quiver. Show this quiver does not have finite type by constructing infinitely many nonisomorphic indecomposable representations.
2. Problem 6.9.2
3. Problem 6.9.3
4. Let Q be an acyclic quiver and for a vertex i let L_i be the one-dimensional representation with $V_i \cong k$ and all other $V_j = 0$.
 - a) Prove the L_i give a complete set of simple modules for Q .
 - b) If $i \rightarrow j$ in Q , prove that $\text{Ext}^1(L_i, L_j)$ is nonzero by explicitly constructing a nonsplit extension.