11. Übungsaufgaben Darstellungstheorie II, SS 07

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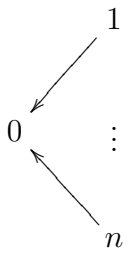
1. Let K be a field, and let Q be a quiver without oriented cycles. Calculate the global dimension of KQ.

2. Find a path algebra KQ and an indecomposable KQ-module X such that $\tau(X) \cong X$.

3. Find a path algebra KQ and an indecomposable KQ-module X such that $\tau^2(X) \cong X$, but $\tau(X) \ncong X$.

4. Let K be a field.

(i) For each integer, n, such that $1 \leq n \leq 5$ knit the preprojective component of $(\Gamma_{KQ_n}, d_{KQ_n})$ where Q_n is the quiver



(ii) For n as in (i) calculate

$$[P, \tau^{-l}(P)] := \dim_K \operatorname{Hom}_{KQ_n}(P, \tau^{-l}(P))$$

for each indecomposable projective KQ_n-module P, and for each $l \geq 0$. In each case analyse the growth (as a function of l) of $[P, \tau^{-l}(P)]$.