

## 10. Übungsaufgaben Darstellungstheorie II, SS 07

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1. Let  $A$  be a finite-dimensional  $K$ -algebra, and let  ${}_{\infty}\underline{\Delta}$  be the subquiver of  $\Gamma_A$  obtained by the knitting algorithm. Show that  ${}_{\infty}\underline{\Delta} = {}_{\infty}(\underline{\Gamma}_A)$ .
2. Let  $Q$  be a finite connected quiver without oriented cycles, and let  $A = KQ$ . Show that  $\Gamma_A$  has a unique preprojective component and a unique preinjective component. Show that these coincide if and only if  $Q$  is representation-finite.
3. Let  $A$  be a finite-dimensional  $K$ -algebra, and let  $\mathcal{C}$  be a connected component of  $\Gamma_A$  such that  $\mathcal{C} \subseteq {}_{\infty}\underline{\Delta}$ . Show that  $\mathcal{C}$  is a preprojective component.
4. Choose a connected quiver  $Q$  with 3 vertices and at least 3 arrows such that  $Q$  has no oriented cycles. Knit the preinjective component of  $Q$ .