

PROBLEM SET # 10
MATH 252

Due April 21.

1. Give an example of a ring that satisfies DCC for left ideals but does not satisfy DCC for right ideals.
2. Let e be an idempotent of a ring R and M be a left R -module. Prove that there is the following isomorphism of abelian groups

$$\text{Hom}_R(Re, M) \simeq eM.$$

3. Let R be a finite dimensional algebra over an algebraically closed field k with the radical N . Let M be an R -module of finite length, $e \in R$ be a primitive idempotent and $S = Re/Ne$ be a simple R -module. Show the the multiplicity of S in Jordan-Hoelder series of M equals the dimension of eM .

4. Find all up to isomorphism indecomposable representations of the quiver

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