

Kashu, Alexei I.

Adjoint functors, preradicals and closure operators in module categories. (English)

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Summary: In this article preradicals and closure operators are studied in an adjoint situation, defined by two covariant functors between the module categories $R\text{-Mod}$ and $S\text{-Mod}$. The mappings which determine the relationship between the classes of preradicals and the classes of closure operators of these categories are investigated. The goal of research is to elucidate the concordance (compatibility) of these mappings. For that some combinations of them, consisting of four mappings, are considered and the commutativity of corresponding diagrams (squares) is studied. The obtained results show the connection between considered mappings in adjoint situation.

MSC:

16D90 Module categories in associative algebras

16S90 Torsion theories; radicals on module categories (associative algebraic aspects)

18A40 Adjoint functors (universal constructions, reflective subcategories, Kan extensions, etc.)

18E40 Torsion theories, radicals

06A15 Galois correspondences, closure operators (in relation to ordered sets)

Keywords:

closure operator; adjoint functors; preradical; category of modules; natural transformation; lattice of submodules

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