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Cover for Modules and Injective Modules

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Abstract: Let R be a commutative ring with identity and M be an R-module with Spec(M) \neq ϕ. A cover of the R-submodule K of M is a subset C of Spec(M) satisfying that for any x \in K, x \neq 0, there is N \in C such that ann(x) \subset (N:M). If we denote by J = $\bigcap_{N \in C}$ (N:M) and assume that M is finitely generated, then JM=M implies that M=0, M is called C-injective provided each R-homomorphism ϕ : (N:M) \rightarrow M with N \in C can be lifted to an R-homomorphism $\bullet$: R \rightarrow M. If R is a commutative Noetherian ring and C'=Spec(R), where C'={(N:M)|N \in C}, then every C-injective R-module is injective.

Key Words: Commutative ring, D-prime module cover, prime submodule, injective module, quasi-injective and injective hull

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