On Some Classes Of Modules And Their Endomorphism Ring

N 02287e8e5f a 02287e8e5f a 02287e8e5f ⊆ 02287e8e5f Von Neumann regular rings were introduced by von Neumann (1936) under the name of "regular rings", in the course of his study of von Neumann algebras and continuous geometry. Von Neumann regular rings should not be confused with the unrelated regular rings and regular local rings of commutative algebra. 02287e8e5f

Glossary of ring theory   The derivation algebra of an algebra A is the subalgebra of the endomorphism algebra Ring theory is the branch of mathematics in which rings are studied: that is, structures supporting both an addition and a multiplication operation. ring R is an R-linear endomorphism that satisfies the Leibniz rule. 2. This is a glossary of some terms of the subject 02287e8e5f

Von Neumann regular ring Then the endomorphism ring EndS(M) is In mathematics, a von Neumann regular ring is a ring R (associative, with 1, not necessarily commutative) such that for every element a in R there exists an x in R with a = axa. M is an S-module such that every submodule of M is a direct summand of M (such modules M are called semisimple). Von Neumann regular rings are also called absolutely flat rings, because these rings are characterized by the fact that every left R-module is flat. One may think of x as a "weak inverse" of the element a; in general x is not uniquely determined by a 02287e8e5f

N 02287e8e5f b... 02287e8e5f 2 02287e8e5f Commutative rings are much better understood than noncommutative ones. Algebraic geometry and algebraic number theory, which provide many natural examples of commutative rings, have driven much of the development... 02287e8e5f

Matrix ring Over a rng, one can form matrix rngs. Some sets of infinite matrices form infinite matrix rings. When we view Mn(C) as the ring of linear endomorphisms of Cn, those In abstract algebra, a matrix ring is a set of matrices with entries in a ring R that form a ring under matrix addition and matrix multiplication. _{n_{i}}(D_{i})} , for some nonnegative integer r, positive integers ni, and division rings Di. The set of all n × n matrices with entries in R is a matrix ring denoted Mn(R) (alternative notations: Matn(R) and Rn×n). A subring of a matrix ring is again a matrix ring 02287e8e5f

1 02287e8e5f N 02287e8e5f . A module is called a serial module if it is the direct sum of uniserial modules. A ring R is called a right uniserial ring if it is uniserial as a right module over itself, and... 02287e8e5f (02287e8e5f

Decomposition of a module Azumaya's theorem states that if a module has an decomposition into modules with local endomorphism rings, then all In abstract algebra, a decomposition of a module is a way to write a module as a direct sum of modules. A type of a decomposition is often used to define or characterize modules: for example, a semisimple module is a module that has a decomposition into simple modules. Given a ring, the types of decomposition of modules over the ring can also be used to define or characterize the ring: a ring is semisimple if and only if every module over it is a semisimple module. direct sum of two nonzero submodules 02287e8e5f

= 02287e8e5f For the items in commutative algebra (the theory of commutative rings), see Glossary of commutative algebra. For ring-theoretic concepts in the language of modules, see also Glossary of module theory. 02287e8e5f f 02287e8e5f f 02287e8e5f b 02287e8e5f A ring may be defined as a set that is endowed with two binary operations called addition and multiplication such that the ring is an abelian group with respect to the addition operator, and the multiplication operator is associative, is distributive over the addition operation, and has a multiplicative identity element. (Some authors apply the... 02287e8e5f ⊆ 02287e8e5f 2 02287e8e5f An element a of a ring is called a von Neumann regular element if... 02287e8e5f

Local ring Specifically, if In mathematics, more specifically in ring theory, local rings are certain rings that are comparatively simple, and serve to describe what is called "local behaviour", in the sense of functions defined on algebraic varieties or manifolds, or of algebraic number fields examined at a particular place, or prime. Non-commutative local rings arise naturally as endomorphism rings in the study of direct sum decompositions of modules over some other rings. Local algebra is the branch of commutative algebra that studies commutative local rings and their modules 02287e8e5f

Serial module ISBN 978-0-273-08446-4 Facchini, Alberto (1998), Endomorphism rings and direct sum decompositions in some classes of modules, Birkhäuser Verlag, ISBN 3-7643-5908-0 In abstract algebra, a uniserial module M is a module over a ring R, whose submodules are totally ordered by inclusion. This means simply that for any two submodules N1 and N2 of M, either 02287e8e5f

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Ring homomorphism If R and S are rings, the zero function In mathematics, a ring homomorphism is a structure-preserving function between two rings. For a ring R of prime characteristic p, R → R, x → xp is a ring endomorphism called the Frobenius endomorphism. More explicitly, if R and S are rings, then a ring homomorphism is a function f : R → S that preserves addition, multiplication and multiplicative identity; that is,. automorphism) 02287e8e5f

(02287e8e5f or 02287e8e5f 1 02287e8e5f b 02287e8e5f In integral domains the regular elements of the ring are its nonzero elements, so in this case a torsion-free module is one such that zero is the only element annihilated by some non-zero element of the ring. Some authors work only over integral domains and use this condition as the definition of a torsion-free module, but this does not work well over more general rings, for if the ring contains zero-divisors then the only module satisfying this condition is the zero module. 02287e8e5f a 02287e8e5f , 02287e8e5f f 02287e8e5f {\displaystyle N_{1}\subseteq N_{2}} 02287e8e5f + 02287e8e5f N 02287e8e5f

Ring theory Ring theory studies the structure of rings; their representations, or, in different language, modules; special classes of rings (group rings, division rings, universal enveloping algebras); related structures like rngs; as well as an array of properties that prove to be of interest both within the theory itself and for its applications, such as homological properties and polynomial identities. integers. Ring theory studies the structure of rings; their representations, or, in different language, modules; special classes of rings (group rings, division In algebra, ring theory is the study of rings, algebraic structures in which addition and multiplication are defined and have similar properties to those operations defined for the integers 02287e8e5f

Torsion-free module Therefore flat modules, In algebra, a torsion-free module is a module over a ring such that zero is the only element annihilated by a regular element (non zero-divisor) of the ring. module. Over a commutative ring R with total quotient ring K, a module M is torsion-free if and only if Tor1(K/R,M) vanishes. In other words, a module is torsion free if its torsion submodule contains only the zero element 02287e8e5f

) 02287e8e5f f 02287e8e5f The concept of local rings was introduced by

Wolfgang Krull in 1938 under the name Stellenringe. The English term local ring is due to Zariski. 02287e8e5f + 02287e8e5f In practice, a commutative local ring often arises as the result of the localization of a ring at a prime ideal. 02287e8e5f {\displaystyle N_{2}\subseteq N_{1}} 02287e8e5f An indecomposable module is a module that is not a direct sum of two nonzero submodules. Azumaya's theorem states that if a module has an decomposition into modules with local endomorphism rings, then all decompositions into indecomposable modules are equivalent to each other; a special case of this, especially in group theory, is... 02287e8e5f

Ring (mathematics) Ring elements may be numbers such as integers or complex numbers, but they may also be non-numerical objects such as polynomials, square matrices, functions, and power series. module over a ring R, then the set of all R-linear maps forms a ring, also called the endomorphism ring and denoted by EndR(V). The endomorphism ring In mathematics, a ring is an algebraic structure consisting of a set with two binary operations called addition and multiplication, which obey the same basic laws as addition and multiplication of integers, except that multiplication in a ring does not need to be commutative 02287e8e5f

) 02287e8e5f For specific types of algebras, see also: Glossary of field theory and Glossary of Lie groups and Lie algebras. Since, currently, there is no glossary on not-necessarily-associative algebra structures in general, this glossary includes some concepts that do not need associativity; e.g., a derivation. 02287e8e5f (02287e8e5f When R is a commutative ring, the matrix ring Mn(R) is an associative algebra over R, and may be called a matrix algebra. In this setting, if M is a matrix and r is in R, then the matrix rM is the matrix M with each of its entries multiplied by r. 02287e8e5f) 02287e8e5f

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